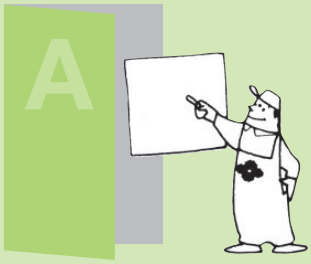
Insert Grades A

A1 to A37



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Grades for Turning

P General Steel (Carbon Steel, Alloy Steel), Mild Steel

Wear Resistance ← → Fracture Resistance

Classification	—	P01	P10	P20	P30	P40
Coated Carbide (A26)		AC8015P	AC8020P	AC8025P	AC8035P	
		AC810P	AC820P		AC830P	
For Small Lathes (A24)			AC1030U			
			AC530U			
Coated Cermet (A29)		T1500Z		T2500Z		
Cermet (A29)		T1000A	T1500A	T2500A		
Cemented Carbide (A30)			ST10P	ST20E	A30	
Ceramic (A36)						
Uncoated CBN Coated CBN (A32)						

M Stainless Steel

Wear Resistance ← → Fracture Resistance

—	M01	M10	M20	M30	M40
		AC6020M	AC6030M	AC6040M	
			AC630M		
				AC1030U	
				AC530U	
		T1000A			
			T1500A		

K Cast Iron

Wear Resistance ← → Fracture Resistance

—	K01	K10	K20	K30
	AC4010K	AC4015K	AC420K	
				AC8025P
			AC1030U	
			AC530U	
	T1000A			
		G10E		
	NB90S			
	New BN7125		BNC8115	
			BNS8125	
	BN500			
	BNC500	(Dedicated for Ductile Cast Iron)		

S Exotic Alloy

Wear Resistance ← → Fracture Resistance

—	S01	S10	S20	S30
Coated Carbide (A26)	AC5005S	AC5015S	AC5025S	
		AC510U	AC520U	
Cemented Carbide (A30)		EH510	EH520	
Ceramic (A36)		WX120		
Coated CBN (A32)				
Uncoated CBN (A32)	NCB100			
	New BN7125			
		BNS8125		

H Hardened Steel

Wear Resistance ← → Fracture Resistance

—	H01	H10	H20	H30
		AC5005S		
		AC503U		
		NB100C		
	New BNC2105			
		BNC2115		
			BNC2125	
				BNC300
		BNC2010		
			BNC2020	
	BN1000			
		BN2000		
				BN350

N Non-Ferrous Metal

Wear Resistance ← → Fracture Resistance

Classification	—	N01	N10	N20	N30
Carbide (A30)					H1
PCD (A34)		DA90			
			DA150		
				DA1000	

Powdered Metal

Wear Resistance ← → Fracture Resistance

Classification	—	01	10	20	30
Coated Carbide (A26)				AC5005S	
Cermet (A29)			T1000A		
Uncoated CBN (A32)		BN7115			
				New BN7125	

Cemented Carbides and Hard Brittle Materials

Wear Resistance ← → Fracture Resistance

Classification	—	01	10	20	30
PCD (A34)		NPD10			
			DA90		

★WX120 is only sold in Japan.

: 1st Recommended Grade : 2nd Recommended Grade : CVD Coating, : PVD Coating, Blank: Uncoated

Grades for Milling

Work Material	P General Steel (Carbon Steel, Alloy Steel), Mild Steel	M Stainless Steel	K Cast Iron
Classification	Wear Resistance ← → Fracture Resistance	Wear Resistance ← → Fracture Resistance	Wear Resistance ← → Fracture Resistance
	— P01 P10 P20 P30 P40	— M01 M10 M20 M30 M40	— K01 K10 K20 K30
Coated Carbide A26	ACU2500, XCU2500, ACP2000, ACP3000, ACP100, ACP200, ACP300	ACU2500, XCU2500, New XCS2000, New ACS2500, New ACS3000, ACM100, ACM200, ACM300, ACK300, ACP300	ACU2500, XCU2500, XCK2000, ACK2000, ACK3000, ACK100, ACK200, ACK300
Cermet A29	T2500A, T250A, T4500A	T2500A, T250A, T4500A	
Cemented Carbide A30	A30N	A30N	G10E
Uncoated CBN Coated CBN A32			New BN7125, BNC8115, BNS8125

Work Material	S Exotic Alloy	H Hardened Steel	N Non-Ferrous Metal
Classification	Wear Resistance ← → Fracture Resistance	Wear Resistance ← → Fracture Resistance	Wear Resistance ← → Fracture Resistance
	— S01 S10 S20 S30 S40	— H01 H10 H20 H30	— N01 N10 N20 N30
Coated Carbide A26	ACU2500, New XCS2000, New ACS2500, New ACS3000, ACM100, ACM200, ACM300, ACK300		DL1000, DL2000
Cemented Carbide A30	EH520		H1, H20
Uncoated CBN A32		BN2000, BN350	
PCD A34			DA1000

: 1st Recommended Grade / : 2nd Recommended Grade ▽: CVD Coating, △: PVD Coating, Blank: Uncoated

Grade Comparison Chart

■ CVD Coated Grades

Application	Work Material	Classification Code	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	MOLDINO	NTK	Sandvik	Kennametal	SECO Tools	WALTER	ISCAR	TaeguTec
For Turning	P Steel	P05	**AC8015P AC810P**	UE6105 MC6115	T9105 T9205	CA510 CA5505	HG8010		GC4305 GC4205	KCP05 KCP05B	TP0501 TP0500	WPP05S WPP05 WPP01	IC8005 IC8150 IC9015	TT8105
		P10	**AC8020P AC8015P AC810P**	MC6115 MC6015 UE6110	T9105 T9115 T9205 T9215	CA510 CA515 CA5515	HG8010	CP7	GC4415 GC4305 GC4315 GC4215	KCP10 KCP10B	TP1501 TP1500	WPP10S WPP10 WPP10G	IC8150 IC8080 IC9015 IC9150 IC9080	TT8115 TT8115B
		P20	**AC8020P AC8025P AC820P**	MC6025 MC6125 UE6020	T9115 T9125 T9215 T9225	CA025P CA525	GM25 HG8025 GM8020	CP7	GC4425 GC4325 GC4225	KCP25 KCP25B	TP2501 TP2500	WPP20S WPP20 WPP20G	IC8150 IC8250 IC9015 IC9150 IC9250	TT5100 TT8125 TT8125B
		P30	**AC8035P AC830P AC6030M AC630M**	MC6035 UE6035	T9125 T9135 T9235	CA025P CA525 CA530	GM25 GM8035		GC4325 GC4335 GC4235	KCP30 KCP30B	TP3501 TP3500	WPP30S WPP30 WPP30G	IC8080 IC9350	TT7100 TT8135
		P40	**AC8035P AC830P AC6030M AC630M**	MC6035	T9135 T9235 T6130	CA530 CA5535	GX30 GM8035		GC4335 GC4235 GC30	KCP40 KCP40B	TP3501 TP3500		IC9350	TT7100
	M Stainless Steel	M10 S10	**AC6020M**	MC7015 MV9005 US7020 US905	T6215 T9115 T9215	CA6515	HS9105		GC2015 GC1515 S05F S205	KCM15	TM1501		IC9250 IC520M	TT9215 TT3005
		M20 S20	**AC6020M AC6030M AC630M**	MC7025 US7020	T6120 T9125 T9215	CA6525	HG8025 HS9115		GC2025 GC1515	KCM25	TP2501 TM2000 TM2501		IC9025 IC9325 IC4050	TT5100 TT9225
	S Exotic Alloy	M30	**AC6030M AC630M AC8035P AC830P**	MC7025 US735	T6130	CA6535	GM8035 GX30 GM25		GC2035 GC235	KCM35	TP3501 TM3501 TM4000		IC9350 IC4050 IC635	TT9235
		M40	**AC6030M AC630M**	US735					GC235 GC2035		TM4000			TT7800
	K Cast Iron	K05	**AC4010K**	MC5005 MC5105 UC5105 UC5115	T505 T5105	CA310 CA4505 CA4010	HX3505	CP1	GC3205 GC3210	KCK05	TK0501 TK1001	WKK10S WAK10	IC5005	TT7005 TT7505
		K10	**AC4010K AC4015K**	MC5005 MC5015 MC5020 MC5115 UC5105 UC5115	T515 T5105 T5115	CA315 CA4505 CA4515 CA4115	HX3305 HX3515 HG8010	CP1	GC3210	KCK15	TK1001 TK1501	WKK10S WKK20S WAK10 WAK20	IC5100 IC9150 IC4100	TT7015
		K20	**AC4015K AC420K AC425K AC8025P**	MC5015 MC5125 UC5115 UE6110	T515 T5115 T5125	CA320 CA4515 CA4120 CA4115	HX3515 GM8020		GC3225	KCK15 KCK20 KCP25C	K2001	WKK20S WAK20 WAK30	IC9150 IC5100 IC4100	TT7015
For Milling	P Steel	P10	**XCU2500 ACP2000 ACP100**	F7030 MC7020 MV1020	T3130				GC4220 GC4330	KCPM20	MP1501 MP1500 MP2501 MP2500	WKP25S WKP25 WKP35S WKP35G	IC4100 IC5400 IC9015 IC8080 IC9080 IC5100	TT7080 TT7515 TT9300
		P20	**XCU2500 ACP2000 ACP100**	F7030 MC7020 MV1020	T3130 T3225		GX2140		GC4330 GC4340	KSPM20 KCPK30	MP2501 MP2500	WKP25S WKP25 WKP35S WKP35G	IC8080 IC9080 IC9250	TT7400
		P30	**XCU2500 ACP2000 ACP100**				GX2160		GC4340	KCPK30 KCPM30			IC9250 IC4050	TT7800 TT8525
	M Stainless Steel	M10	**XCS2000 XCU2500 ACM200**							KCPM20				
		M20	**XCU2500 ACM200**	F7030 MC7020 MV1020	T3130 T3225	CA6535	GX2160 AX2040		GC2040	KCPM20 KCPM30	MP2500 MP2501 MS2500	WMP45G WSM45X		TT7800 TT8525
		M30	**XCU2500 ACM200**							KCPM20 KCPM30	MP2500 MP2501 T350M		IC5820	TT7800 TT8525
	K Cast Iron	K10	**XCK2000 ACK2000 ACK200**		T1215					KCK15			IC5100	TT6800
		K20	**XCK2000 XCU2500 ACK2000 ACK200**	MC520 MV1020 MC5020 F5010 F5020	T1115 T1215	CA420M	GX2120		GC3330 GC3220 GC3225 GC3020 GC3040	KC915M KC930M KC935M	MP1501 MK1500	WAK15 WKP25S WKP35S WKP35G	IC5100 DT7150 IC4010 IC4050 IC4100	TT6800

■ PVD Coated Grades

Application	Work Material	Classification Code	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	MOLDINO	NTK	Sandvik	Kennametal	SECO Tools	WALTER	ISCAR	TaeguTec
For Turning	P Steel	P10	**AC1030U ACZ150 AC5005S AC5015S AC5025S AC520U**	VP15TF MS6015	AH110 AH120 AH710 AH725	PR915 PR930 PR1005 PR1215 PR1225 PR1705		TM1 VM1 DT4 DM4	GC1525	KCU10 KC5510	TS2000	WSM10	IC507 IC807 IC907	
		P20	**AC1030U AC5025S AC520U AC530U**	VP15TF VP20RT	AH120 AH725 AH3135	PR1225 PR1425 PR1725	IP2000	TM1 TM4 VM1 QM3 DM4	GC15 GC1125 GC1525	KCU25 KC5525	TS2500	WSM20	IC507 IC807 IC907	TT9030
		P30	**AC1030U AC530U**	VP15TF VP20RT	AH120 AH725 SH730 AH730	PR1425 PR1525 PR1535	IP3000 CY250	QM3	GC1125				IC328 IC928	TT8020 TT9030
		P40	**AC1030U**			PR660	IP3000		GC4335 GC4235				IC830	TT8020

Note: The above data was collected from various published catalogues. The information may therefore not be up to date.

Grade Comparison Chart

■ PVD Coated Grades (continued)

Application	Work Material	Classification Code	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	MOLDINO	NTK	Sandvik	Kennametal	SECO Tools	WALTER	ISCAR	TaeguTec
For Turning	M Stainless Steel / S Exotic Alloy	M10 S10	**AC5005S AC5015S AC5025S AC510U AC520U ACZ150**	MP9005 MP9015 VP15TF VP05RT VP10RT	AH110 AH710 AH725 AH905 AH6225 AH8005	PR005S PR015S PR915 PR1025 PR1215 PR1225 PR1305 PR1310	IP050S IP100S JP9105 JP9115	TM1 VM1 DT4 DM4 ZM3 ST4	H5D6 GC1105 GC1115	KCS10 KCS10B KC5510 KCU10	TH1000 TS2000	WSM01 WSM10 WSM10S	IC804 IC807 IC808 IC907 IC908	TT3005 TT3010 TT5080 TT8010
		M20 S20	**AC5015S AC5025S AC1030U AC520U**	MP9015 MP9025 VP15TF VP20RT VP20MF UP20M MS7025 MS9025	AH630 AH120 AH725 AH6225 AH8015	PR015S PR915 PR930 PR1025 PR1125 PR1215 PR1225 PR1325 PR1725	IP100S HS9115	DT4 DM4 ZM3 QM3 TM4 ST4	GC15 GC1115 GC1125	KC5525 KCU25 KC5025	TS2500	WSM20 WSM20S	IC330 IC806 IC808 IC830 IC908 IC928	TT3020 TT8010 TT8020 TT9030
		M30	**AC5025S AC6040M AC1030U AC520U AC530U**	MP7035 VP15TF VP20MF MS7025 MS9025	AH630 AH645 AH725 AH6235	PR1125 PR1525 PR1535		QM3 TM4 DT4 DM4	GC1125			WSM30 WSM30S	IC328 IC330 IC830 IC840 IC882	TT8020
		M40	**AC6040M AC1030U AC530U**	MP7035 VP15TF MS6015 MS7025	AH645 AH6235	PR1125 PR1535	GX30						IC830 IC928	TT8020
	K Cast Iron	K10	**AC1030U AC510U ACZ150 AC5015S**	VP10RT	AH110 AH120	PR905	HX3305 HG3305 HG3315 HX3515 HG8010 TH315 ATH10E		GC15				IC810	TT9030
		K20	**AC1030U AC510U ACZ150 AC5015S AC5025S**	VP10RT VP20RT VP15TF	AH120	PR905		DM4 QM3						TT9030
		K30	**AC1030U AC530U**	VP15TF VP20RT	AH110 AH120 AH725								IC830 IC908 IC910 IC928	
For Milling	P Steel	P10	**ACU2500 ACP200**	VP15TF MP6120	AH110 AH120 AH710 AH725	PR1225	PN215 PN15M JP4105 JP4115 JP4120 CY9020	DT4 DM4	GC1010	KC505M KC510M KC515M KCKP10	F25M			TT2510 TT7080
		P20	**ACP3000 ACU2500 ACP200 ACP300**	VP15TF VP20RT MP6120 MP6130 UP20M	AH9030 AH120 AH725 AH3035 AH3225	PR1525 PR1225 PR1230 PR830	JP4120 CY150 CY9020 JS4045	TM4 DT4 DM4	GC1010 GC1025	KC522M KC525M KCSM30 SP6519	MP3000 F30M F32M F40M	WSM35 WSM35S	IC808 IC810 IC908 IC910	TT7080 TT9030 TT9080
		P30	**ACP3000 ACU2500 ACP200 ACP300**	VP15TF VP30RT MP6130 UP20M	AH3035 AH3135 AH3225 AH120 AH130 AH140 AH725	PR1525 PR1230 PR830	JS4045 JS4060 CY25 CY150 CY250 CY250V HC844 PTH30E	DM4 TM4 ZM3	GC1030 GC1130 GC2030	KC725M KC735M KC525M KC530M KCPM40 KCSM30 SP6519 X400	F40M T60M MP3000	WSM35 WSM35S WSP45 WSP45G WSP45S	IC328 IC330 IC830 IC928	TT8080 TT8020 TT8525B
		P40	**ACP3000 ACU2500 ACP300**	VP30RT	AH140		JS4060 JM4160 PTH40H			KC725M KC735M KCPM40		WSP45 WSP45G WSP45S	IC830 IC845 IC928	TT8020 TT8080 TT8525B
	M Stainless Steel / S Exotic Alloy	M10	**ACM100 ACU2500 ACK300 ACP300**	MP9120 VP15TF	AH110 AH120 AH330 AH725 AH8005 AH8015	PR1210 PR1225	CY9020 JP4120 PN08M PN15M PN208 PN215	DT4 DM4 ZM3	GC1010 GC1025 GC1030 GC1130	KC515M SP4019 SP6519			IC808 IC908	
		M20	**ACS2500 ACU2500 ACP300**	MP7030 MP7130 MP9030 MP9120 MP9130 UP20M VP15TF VP20RT	AH120 AH130 AH330 AH725 AH3225 AH8015	PR1210 PR1225 PR1525 PR830	JP4120 CY150 JS1025	DT4 DM4 ZM3	S30T	KC522M KC525M SP4019 SP6519 X700	F25M F30M F32M MP3000 MS2050 MM4500	WSM35 WSM35S	IC328 IC330 IC808 IC830 IC840 IC908 IC928	TT9080 TT9030
		M30	**ACM300 ACS2500 ACS3000**	MP7030 MP7130 MP7140 MP9030 MP9130 MP9140 UP20M VP15TF VP20RT	AH130 AH140 AH330 AH725 AH3135	PR1525 PR1535 PR830	JM4160 PTH30E JS1025	DT4 DM4 ZM3	GC2030 GC1040 S30T	KC522M KC525M KC530M KC725M KC735M KCPM40 KCSM30 KCSM40 X700	F30M F32M F40M MP2050 MS2050	WSM35 WSM35S WSP45 WSP45G WSP45S	IC328 IC330 IC830 IC840 IC882 IC928	TT8020 TT8080 TT9080
		M40	**ACM300 ACS3000**	MP7140 MP9140 VP30RT	AH140	PR1535	JM4160 PTH40H			KC725M KCPM40 KCSM40		WSP45 WSP45G WSP45S	IC328 IC330 IC882	TT8020 TT8080
	K Cast Iron	K05	**ACK3000**	MP8010	AH110 AH710		TH303 TH308 ATH80D PTH08M		GC1010	KCKP10 SP4019	MH1000			
		K10	**ACK3000 ACU2500**	MP8010	AH110 AH120 AH330 AH710	PR1210	ATH10E TH315 CY100H		GC1010 GC1020	KC514M KC515M KC520M KCK20 KCK20B SP4019 SP6519	MH1000		IC810 IC910	TT7080 TT7515
		K20	**ACK3000 ACU2500 ACK300**	MP8010 VP15TF	AH110 AH120 AH330 GH330	PR1210 PR1510	JP4120 PTH13S CY100H CY9020	DM4	GC1020 GC1025	KC514M KC524M KCK20 KCK20B SP6519	MK2050 MK3000	WKK25S	IC808 IC810 IC830 IC908 IC910 IC928	TT6080 TT7515
		K30	**ACK3000 ACU2500 ACK300**	VP15TF VP20RT	AH725 AH120 AH330 GH110 GH130 GH330	PR1510 PR1210	JS4045 CY150 CY250		GC1025 GC1030 GC1130	KC520M KC522M KC524M	MK2050		IC830 IC810 IC910 IC928	TT6080

Note: The above data was collected from various published catalogues. The information may therefore not be up to date.

Grade Comparison Chart

■ Cermet

Application	Work Material	Classification Code	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	MOLDINO	Sandvik	Kennametal	SECO Tools	WALTER	ISCAR	TaeguTec
For Turning	P Steel	P10	**T1500Z* T1000A T1500A**	AP25N* VP25N* NX2525	GT720* GT9530* AT9535* J9530* NS520	TN60 TN6020 TN610 TN620 PV710* PV720* CCX*	CZ25* CH550	CT5015	KT125 HTX KT1120			IC20N IC30N IC520N	PV3030 PV3010 CT3000
		P20	**T1500Z* T2500Z* T1500A T2500A**	AP25N* NX2525 NX3035 MP3025*	NS9530 GT9530* AT9530* J9530*	TN90 TN620 TN6020 PV720* CCX*	CZ25* CH550	GC1525*	KT6215 KT315* KT175 KT5020*	CM CMP C15M TP1020		IC20N IC30N IC520N IC530N	CT7000
		P30	**T2500Z* T2500A**	NX2525 MP3025* VP45N*	NS9530 GT9530* AT9530*	TN620 PV720* PV730*							
	K Cast Iron	K10	**T1000A**	AP25N* VP25N* NX2525	GT720* GT9530* NS9530 J9530* NS520	TN610 PV7005* PV710* CCX*	CH550	CT5015	KT125 HTX				PV3030 CT3000
For Milling	P Steel	P30	**T2500A T250A T4500A**	NX2525 MX3030 NX4545 VP45N*	NS540 NS740	TN60 TN90 TN100M TN620M	MZ1000* MZ2000* MZ3000* CH7030 CH7035	CT530	KT530M* KTPK20*	C15M		IC30N	

* mark indicates coated cermet

■ Cemented Carbide

Application	Work Material	Classification Code	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	MOLDINO	NTK	Sandvik	Kennametal	SECO Tools	WALTER	ISCAR	TaeguTec
For Turning / For Milling	P Steel	P10	**ST10P**		TH10		WS10		S1P					
		P20	**ST20E**	UTi20T	KS20		EX35		SMA	K125M			IC07 IC50M	UF10
		P30	**A30 A30N**	UTi20T	KS15F UX30	PW30	EX35 EX40		SM30				IC54 IC28	P30
		P40	**ST40E**		TX40		EX45		S6				IC54 IC28	
	M Stainless Steel	M10	**EH510**		TH10		EX35 WA10B	KM1	H10A	KU10,K313 K68,KYSM10	890		IC07,IC20 IC08	
		M20	**EH520**	UTi20T	KS20		EX35		H13A	K313 K68	HX 883		IC07,IC20 IC08	UF10
		M30	**A30 A30N**	UTi20T	UX30				H10F SM30				IC28	
	K Cast Iron	K01	**H2 H1**	HTi05T	KS05F		WH01 WH05			KU10,K313 K68,K115M			IS8	
		K10	**H1 EH510**	HTi10	TH10	KW10 GW15	WH10	KM1	H13A	KU10,K313 K68,K115M K110M KY3500	890		IC20,IS8	K10
		K20	**G10E,H10E EH520**	UTi20T	KS15F KS20	GW25	WH20	KM3	H13A	KMF KY3500 KYHS10	890 883 HX		IC20 IS8	
		K30	**G10E,H10E**	UTi20T			WH30			KY3500	883			
	S Exotic Alloy	S10 S20	**EH510 EH520**	RT9005 RT9010 MT9015 TF15	TH10 KS05F KS15F KS20	SW05,SW10 SW25,KW10 GW15	WH10		H10A H10F H13A	KU10,K313 K68,KMF K110M,KYHS10 K1025	HX H25		IC20,IC07 IC08,IC28	K10
	Micro-fine Grained Carbide	Z01	**F0**	SF10,MF07 MF10,TBA16A	F,MD1508 MD08F		NM08						IC07	UF1A
		Z10	**AFU XF1**	HTi10 MF20	M,MD10 MD05F,MD07F	FW30	NM15		6UF,8UF PN90,H6FF		890		IC07	UF1A
		Z20	**AF0 AF1**	TF15 MF30	EM10,MD20 MD15		BRM20 EF20N		12UF		890 883		IC08	UF10
		Z30	**A1**		UM		NM25		N6F,H10F		883		IC08	

■ Ceramic

Application	Work Material	Sumitomo Electric	Tungaloy	Kyocera	NTK	Sandvik	Kennametal	TaeguTec
For Turning / For Milling	H Hardened Steel	**NB100C**	WG300 LX11	A66N A65 KT66 PT600M	HC4,HC7 ZC7,WA1	GC6050 CC650 CC670	KY1615 KY4300	AB20 AB2010
	S Exotic Alloy	**WX120***	WG300	CF1 KS6030 KS6040	WA1 SX9	CC6060 CC6065 CC670	KY4300 KY1540	TC430 AS20
	K Cast Iron	**NB90S**	LX11,LX21 CXC73,FX105 CX710	A65,A66N KA30,KS500 KS6000,KT66 PT600M CS7050,KS6050	HC1,HW2,HC2,HC6 HC7,WA1,SX1,SX2 SP2,SX9,SX8	CC620,CC650 CC6090 GC1690	KY1615,KY1310 KY1320,KY3500 KY4300	AW120,AB30 AS500,AS10 SC10

★WX120 is only sold in Japan.

Note: The above data was collected from various published catalogues. The information may therefore not be up to date.

Grade Comparison Chart

■ CBN

Application	Work Material	Classification Code	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	NTK	Chukyo	Sandvik	Kennametal	SECO Tools	ISCAR
For Turning / For Milling	K Cast Iron	K01	**NCB100 BNC500* BN7125 BN500**	BC5110 MB710 MB5015	BX910 BX930 BX870	KBN475 KBN60M	B30 B16		CB50 CB7525	KB1340		IB50 IB85
		K10	**BN7125 BN500**	MB710,MB730 MB5015,MB4020	BX470,BX480 BX950	KBN60M KBN900	B23 B16	HB55,HB56 HB569 HB580,HB57	CB7925		CBN200,CBN300 CBN300P,CBN400C	IB55 IB90
		K20	**BN7125 BNC8115 BNS8125**	MB730,MB4020 MB4120,MBS140	BX470,BX480 BXC90,BX90S	KBN900		HB56,HB569 HB580,HB57				
		K30	**BNC8115 BNS8125**	MB4120,MBS140 BC5030	BXC90 BX90S			HB57		KB5630	CBN500	
	S Exotic Alloy	S01	**NCB100 BN7125**	MB730 MB4020 MB4120	BX940,BX950 BX470,BX480 M714B			HB55 HB580 HB52		KB5630 KB1340		IB85 IB05S IB10S
	H Hardened Steel	H01	**BNC2105 BNC2010 BNC2115 BN1000 BN2000 BNX10**	BC8210 BC8105 BC8110 MB8110	BXA10 BXM10 BX310	KBN05M KBN10M KBN510	B5K B52	HB55 HB550 HB580 HB590	CB7105	KBH10B KB5610	CH0550 CBN10 CBN100 CBN060K	IB05H IB50 IB10HC
		H10	**BNC2010 BNC2020 BNC2115 BNC2125 BN2000**	BC8210 BC8220 BC8110 BC8120 MB8025 MB8110	BXA10 BXM10 BX330 BX530	KBN05M KBN25M KBN525	B5K B6K B52 B36	HB55 HB59 HB550 HB580 HB52	CB7015 CB7115 CB20	KBH20B KBH20 KBH10B KB5610 KB5625	CBN10 CBN100 CBN150 CBN060K CBN160C	IB10H IB55 IB25HA
		H20	**BNC2020 BNC2125 BNX20**	BC8220 BC8120,BC8020 MB8025,MB8120	BXA20 BXA40 BXM20 BX360	KBN020 KBN35M KBN900	B36 B40 B6K	HB57,HB59 HB590 HB580	CB7025 CB7125 CB50	KBH20B KBH20 KB5625 KB5630	CH2540 CBN150 CBN160C	IB20H,IB20HC IB25H,IB25HC
		H30	**BNC300 BN350**	BC8130 MB8130	BXM20 BXA20 BXA30 BXC50 BX380 BR35F	KBN020 KBN35M KBN900	B40	HB57 HB580	CB7135 CB7525	KB5630	CH3515	IB90

* mark: For ductile cast iron cutting

■ Polycrystalline Diamond

Application	Work Material	Classification Code	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	NTK	Chukyo	Sandvik	Kennametal	SECO Tools	ISCAR
For Turning / For Milling	N Non-Ferrous Metal	N01	**DA1000 DA90**	MD205	DX180 DX160	KPD001	PD1		CD05 CD10	KD1400		ID5
		N10	**DA1000 DA150**	MD205 MD220	DX140	KPD001 KPD010 KPD230	PD2	HD100 HD30 HD60	CD1810	KD1400 KD1425	PCD05 PCD10	ID5
		N20	**DA1000 DA2200**	MD220 MD230	DX120 DX110	KPD230 KPD250	PD2	HD100 HD30 HD50		KD1400 KD1425	PCD05 PCD20	
		N30	**DA1000 DA2200**	MD2030 MD230	DX110			HD30,HD50 HD700 HD100		KD1400	PCD05 PCD30 PCD30M	

Note: The above data was collected from various published catalogues. The information may therefore not be up to date.

Chipbreaker Comparison Chart

■ Negative type Inserts

Work Material	Application	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	MOLDINO	NTK	Sandvik	Kennametal	SECO Tools	WALTER	ISCAR	TaeguTec
P Steel	Fine Cutting	**FA**	FH,FP	TF	GP			QF	FF	FF1		SF	
		FL,FB	FS,FY	NS,ZF	XP,XF,VF VC,SK	FE	WM			FF2	FP5		FA
	Finishing	**LU,FE**	SA,SY	NM	PP,XQ,CQ	BE	ZF1	LC	FN		NF3		FG
		SU	SH	TS,TSF	HQ	CE,B,BH	UL,WV	XF,MF	CT	MF2		NF	FC
	Finishing (Wiper Edge)	**LUW**		AFW,FW	WP,WF			WL,WP		W-FF2			
		SEW	SW	ASW,SW	WQ			WF,WMX	FW	W-MF2	NF	WF	WS
	Finishing to Light Cutting	**SE,SX**	LP	AS,ZM	CJ,XS	AB,CT	ZW1,WR	PF,KF	LF,33		MP3,NS6	F3P,TF	
	Medium Cutting	**GU(UG)**	MA,MV	TM,TQ	HS,PS	AH	ZP	XM,QM PMC	P,MG	M3	MU5	GN	ML,MP MC
		GE,UX	MH,MP	DM,AM	PQ,GS PT,PG	AE,AY	Z5	PM,SM KM,HM	MN,MP1		MP5,NM4 NM6	RF,LF	PC,MT
	Medium Cutting (Wiper Edge)	**GUW**	MW		WE			WM	MW,RW	W-M3	NM	WG	WT
	Roughing	**MU,ME**	RP,GH	TH,S	HT,GT PH	RE,AR	G	PR,XMR KR	RP	M5,MR7	RP5,NM9 RP7	M3P,NR	RT
		MX,MP	HAS,MT	CH					RN	MR6			
	Heavy Cutting	**HG**	HZ,HX,HL	THS,TRS	PX,Standard	TE,UE		QR	RM,MR	R4,R5,M6	NR6,NRF	NM	RX
		HP	HH,HXD,HR	65				HR,SR	RH	R7,MR7	NR8	TNM	RH
		HU,HW	HV			H							HT,HD HY
		HF	HCS	TUS		HX,HE		MR		RR9	NRR	R3P	HZ
M Stainless Steel	Finishing	**SU,EF**	LM,SH	SS	MQ,GU	SE,MP,AB	ZF1	MF	FP,FS,LF	MF2	NF4,FM5	F3M	EA,SF
	Light to Medium Cutting	**EX,EG**	GM,MS	SF,SA	MS,MU	PV	ZP	23	MS	MF1,M1	MM5	TF,VL	EM
	Medium Cutting	**GU**	MM	SM		DE		MM,MMC SMR	MP	MF3,M3	NM4,MS3 MU5	M3M PP	ET
	Roughing	**HM**	ES,1M,2M,HL	S		AE			UP	MF4,MF5	NR4,RM5		VF
		EM,MU	RM,GH,HM	SH	TK			MR,MRR		M5,MR3 MR4	HU5	MR,R3M M4MW	SU
K Cast Iron	Light Cutting	**UZ**	LK,MA,MK	CM,CF	Standard, C, KQ	V,VA		KF	UN	M4	NM5	GN	MT
	Medium Cutting	**GZ(UX),ME**	GK,RK,GH	Standard, CH 33	ZS,GC KG,KH	Y,RE		KM,KR KRR		MR7	RK5,RK7		RT
N Non-Ferrous Metal	Finishing	**AX**		P	AH				MS				
S Exotic Alloy	Finishing	**EF**	LS,FJ	HRF				SF,SGF			NFT	F3S	
	Medium Cutting	**EG,EX**	MS,MJ	HMM,SA,HRM	SQ	VI		SM,SMC		M1	NMT,NMS NMT	VL	
	Roughing	**MU,EM**	RS,GJ		SG,SX			SMR		MR3,MR4	NRT,HU5 NRS		
H Hardened Steel	Finishing	**GH,FV***		HP*									
	Light Cutting	**LV***	BF*	HF*	HH*,HL*							HF*	
	Carburised Layer Removal	**SV***	BM*, BR*	HM*, HS*	HD*							HM*	

( ) indicates a discontinued item. * mark indicates CBN/PCD tool breaker

Note: The above data was collected from various published catalogues. The information may therefore not be up to date.

Chipbreaker Comparison Chart

■ Positive type Inserts

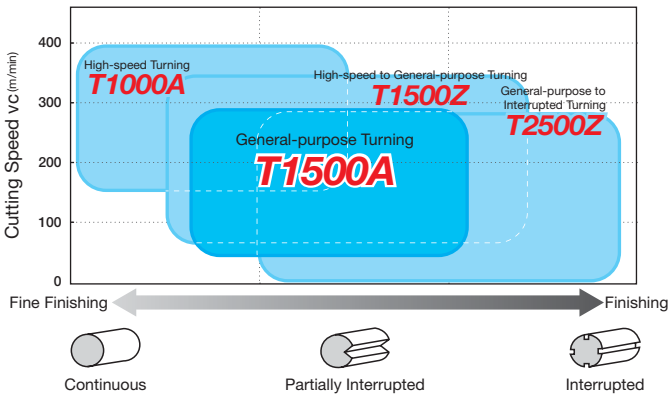
Work Material	Application	Sumitomo Electric	Mitsubishi	Tungaloy	Kyocera	MOLDINO	NTK	Sandvik	Kennametal	SECO Tools	WALTER	ISCAR	TaeguTec
P Steel	Fine Finishing / Finishing	**FF**		01	CF		AMX,FG						
	Finishing	**FC**	FJ,AM	JRP,JTS	GF,VF P,PF		AM3,AZ7	UM		GT-F1	FM4		
		FB,LU (FP,FK)	FP,FM FV,SQ	PSF,PF,23 SS,JSS	GP,XP,PP MQ,DP	JQ,MP	ZR	PF,UF MF,XF	11,UF,MF KF,XF	FF1	FP4	PF	FA,FX
	Finishing (Wiper Edge)	**SDW**						WK,WM	MW	W-F2		WG	
		LUW	SW		WP			WF	FW	W-F1	PF	WF	WT
	Finishing to Light Cutting	**SI**	SMG	JS,CM,PSS	CK,SKS		YL,1L						SA
		LB	LP,LM		XQ		AM2		LF				
	Light to Medium Cutting	**SC**			GQ, SK,Standard		AF1,CL		MP	MF2			
		SU,GU (SK,SF)	SV,MQ	PS,TSF TM	HQ,XQ GK	JE	AZ8,AM2 AM5	PM,UM XM		F1	MP4,MM4 FP6,PM5	SM,14	FG,PC
	Medium Cutting	**MU**	MP,MM MK,MV	PM				PR,UR,MMC MPC,XR	MF	F2,M3 M5	RP4,RM4	19	MT,PMR
M Stainless Steel	Fine Finishing / Finishing	**FF**											
	Finishing	**FC**	FM,FV	PSF,PF SS,JSS			AZ7	MF,XF	11,UF	FF1	FM4	PF	FA,FX
	Finishing to Light Cutting	**SI**	SMG				YL,1L,CL	UF	LF,FP				FG
		LB	LM		MQ					F1			
	Light to Medium Cutting	**SU,GU**	SV		HQ		AM5	MM	MP	MF2	MM4,PS5	SM	PC
	Medium Cutting	**MU**	MM,MV Blank	PM				UM,MR XR,UR	MF	F2,M3 M5	PM5,RM4		MT,PMR
K Cast Iron	Fine Finishing / Finishing	**FF**			CF								
	Finishing	**FC**		CM				KF,XF	11,UF		FK6		
	Light to Medium Cutting	**MU**	MK				AF1,FM	KM,UM,XR	FP,LF MF,MP	M5	MK4,RK4		MT
N Non-Ferrous Metal	Finishing	**AG,AW,AY**	AZ	AL,PP	AH,AP			AL	HP	AL	PM2	AS,AF	FL
	Finishing to Light Cutting	**LD*,GD***											SA
S Exotic Alloy	Fine Finishing / Finishing	**FF**			CF								
	Finishing	**FC,SI**	FS	PSS	PP,MQ			WF,MF					
	Light to Medium Cutting	**SU,GU**	LS,MS	PS,PM	HQ,GK			UM,PM		MF2,R2 R3	FV4,MV4		
H Hardened Steel	Finishing	**FV***		HP*									
	Light Cutting	**LV***	BF*										

( ) indicates a discontinued item. * mark indicates CBN/PCD tool breaker

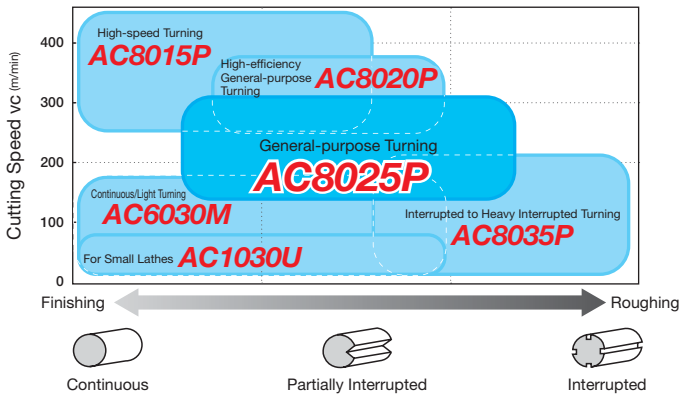
Note: The above data was collected from various published catalogues. The information may therefore not be up to date.

Grades

● Fine Finishing to Finishing (Cermet)

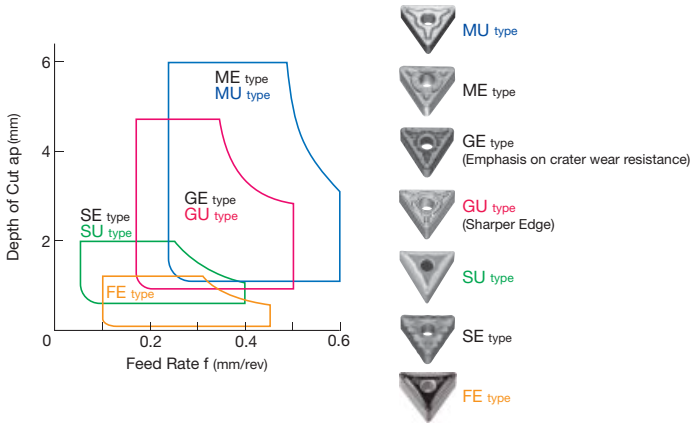


● Finishing to Roughing (Coated Carbide)

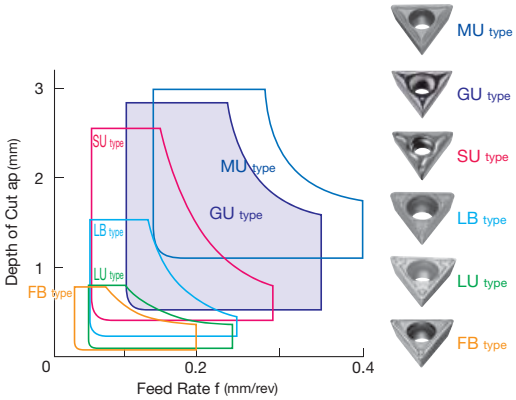


Main Chipbreakers

Negative type



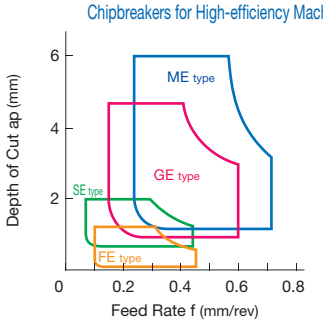
Positive type



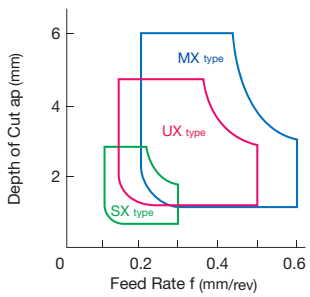
Sub-Chipbreakers

Negative type

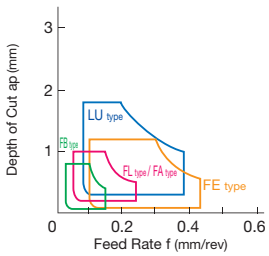
Chipbreakers for High-efficiency Machining



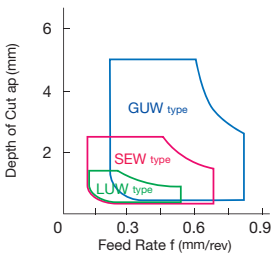
Strong Cutting Edge Chipbreakers



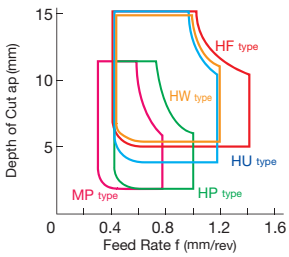
Chipbreakers for Small Depth of Cut



Wiper Insert



Chipbreakers for Heavy Cutting



Grades

Uncoated Cermet / Coated Cermet

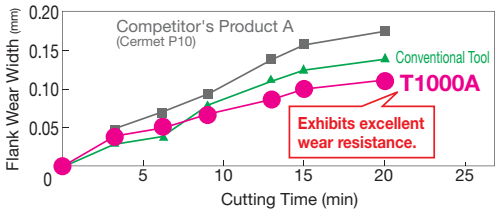
T1000A / T1500A / T1500Z / T2500Z

T1000A: High-hardness cermet with outstanding wear resistance and toughness. Realises high dimensional accuracy for continuous steel machining or finishing of sintered alloy or cast iron.
T1500A: General-purpose cermet made from hard grains with different grain sizes, delivering functionality that provides an excellent balance of wear resistance and toughness. Also achieves good surface finish quality.
T1500Z: Employs Brilliant Coat PVD coating with excellent lubricity to provide better wear resistance and consistent surface finishes in low-speed cutting applications such as machining of small products or low carbon steel.
T2500Z: A new cermet substrate with excellent thermal conductivity is used to achieve outstanding thermal crack resistance. Also uses Brilliant Coat, which has excellent lubricity.

Cutting Performance

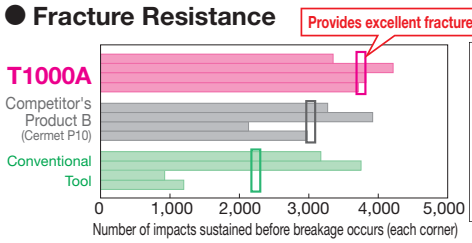
T1000A

● Wear Resistance



Work Material: SCM435
Insert: CNMG120408N-SU
Cutting Conditions: vc= 320m/min, f= 0.20mm/rev, ap= 1.5mm Dry

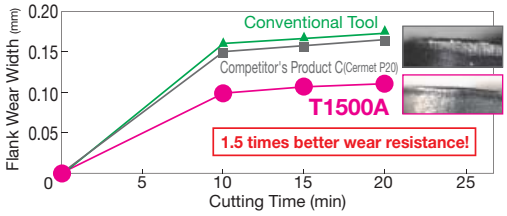
● Fracture Resistance



Work Material: SCM435 (Interrupted Cutting)
Insert: CNMG120408N-SU
Cutting Conditions: vc= 230m/min, f= 0.20mm/rev, ap=1.0mm Wet

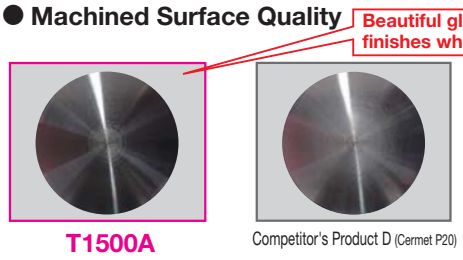
T1500A

● Wear Resistance



Work Material: SCM435
Insert: CNMG120408N-SU
Cutting Conditions: vc= 230m/min, f= 0.20mm/rev, ap=1.0mm Wet

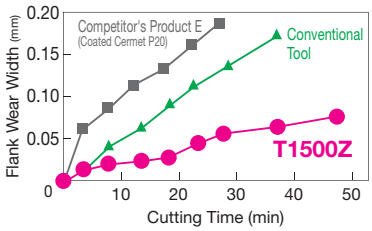
● Machined Surface Quality



Work Material: S25C
Insert: CNMG120408N-SU
Cutting Conditions: vc= 185 to 0m/min, f= 0.15mm/rev, ap=1.5mm Wet

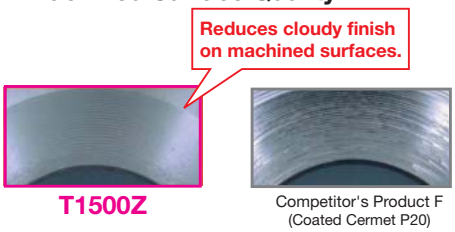
T1500Z

● Wear Resistance



Work Material: SCM435
Insert: CNMG120408N-SU
Cutting Conditions: vc= 230m/min, f= 0.20mm/rev, ap= 1.0mm Wet

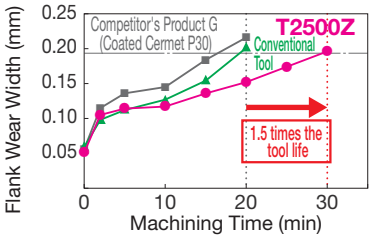
● Machined Surface Quality



Work Material: SNCM220H
Insert: DNMG150408N-SU
Cutting Conditions: vc= 150m/min, f= 0.20mm/rev, ap= 1.0mm Wet

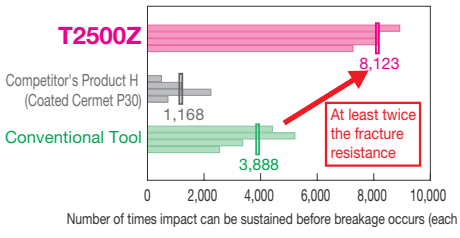
T2500Z

● Wear Resistance



Work Material: SCM435
Insert: CNMG120408N-SU
Cutting Conditions: vc= 260m/min f= 0.23mm/rev ap= 1.5mm Wet

● Fracture Resistance



Work Material: SCM435 (Interrupted Cutting)
Insert: CNMG120408N-SU
Cutting Conditions: vc= 260m/min f= 0.23mm/rev ap= 1.50mm Wet

Recommended Cutting Conditions

Work Material	Application	Chipbreaker	Grade	Cutting Conditions (Min. - **Optimum** - Max.)		
				Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Mild Steel (SS400, etc.)	Fine Finishing	FB/FL	T1500Z	0.2-**0.5**-1.0	0.05-**0.15**-0.25	150-**280**-400
	Finishing	FE/LU	T2500Z	0.3-**1.0**-1.8	0.08-**0.20**-0.35	150-**280**-400
Carbon Steel Alloy Steel (S45C, SCM435, etc.)	Fine Finishing	FB/FA	T1500A	0.2-**0.5**-1.0	0.05-**0.15**-0.25	100-**200**-300
	Finishing	FE/SU	T1500A	0.5-**1.0**-2.0	0.08-**0.20**-0.35	100-**200**-300
	Medium	GU	T1500Z	0.8-**2.2**-4.0	0.15-**0.25**-0.50	100-**200**-300
Hard Steel Alloy Steel (SCM440H, etc.)	Fine Finishing	FB/FA	T1000A	0.2-**0.5**-1.0	0.05-**0.15**-0.25	50-**150**-250
	Finishing	FE/SU	T1500Z	0.5-**1.0**-2.0	0.08-**0.20**-0.35	50-**150**-250
	Medium	GU	T1500Z	0.8-**2.2**-4.0	0.15-**0.25**-0.50	50-**150**-250

Grades

ABSOTECH AC8015P / ABSOTECH AC8020P / ABSOTECH AC8025P / ABSOTECH AC8035P / ABSOTECH AC1030U

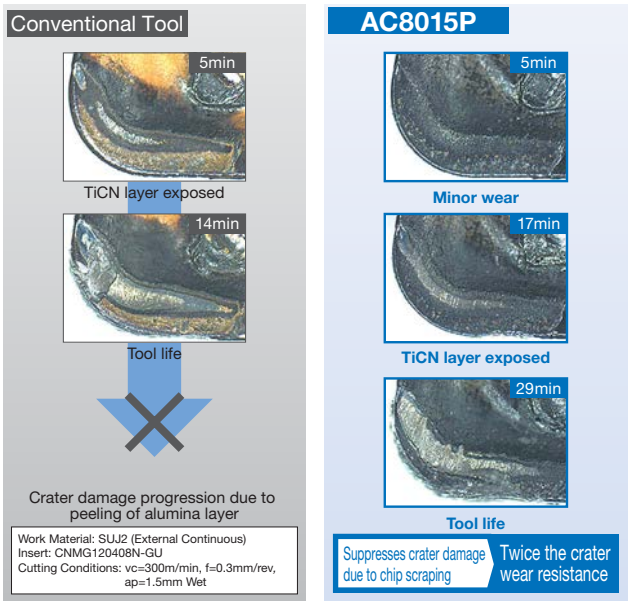
Covers a wide range of machining applications from high-speed to interrupted cutting and small lathes

AC8015P: Development of crater damage is suppressed by controlling the orientation of the alumina crystal grains. Achieves long, stable tool life during high-speed and high feed cutting.
AC8020P: Alumina coating with even higher strength balances outstanding stability and wear resistance in turning mill-scale on forged material. Gold-colored coating makes used corners easily identifiable.
AC8025P: Our 1st recommended grade for turning steel. Surface smoothing technology significantly suppresses adhesion of work material components. Achieves long, stable tool life with various cutting speeds and work materials.
AC8035P: Tensile stress removal of the coating layer greatly improves fracture resistance. Achieves long, stable tool life during heavy interrupted cutting.
AC1030U: Employs a new PVD coating, and a dedicated tough carbide substrate. High-quality cutting edge grade suppresses adhesion and micro-chipping, realizing excellent machined surface quality.

Cutting Performance

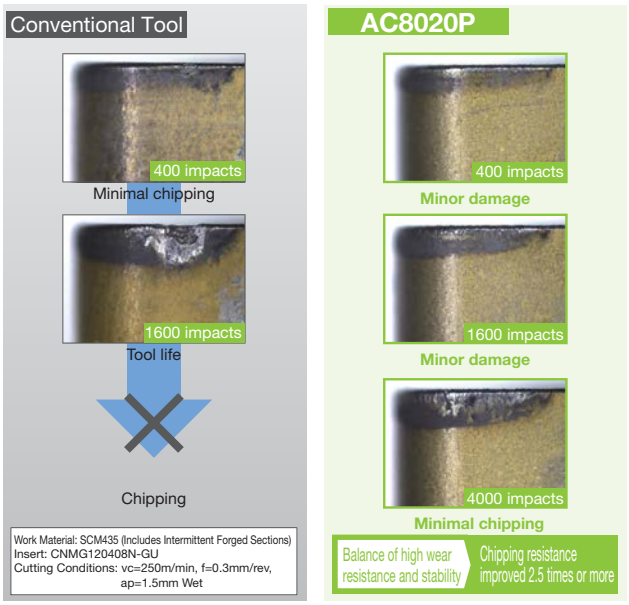
AC8015P

● Alumina crystal grain orientation control technology suppresses crater damage due to chip abrasion



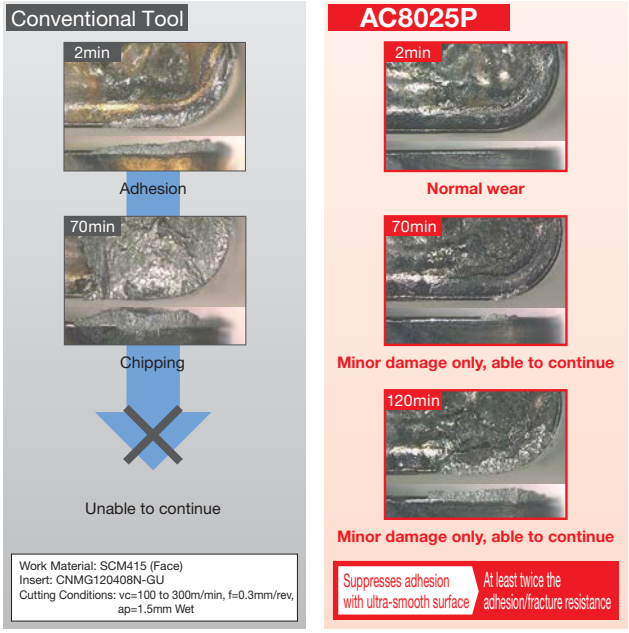
AC8020P

● Alumina coating with even higher strength suppresses chipping



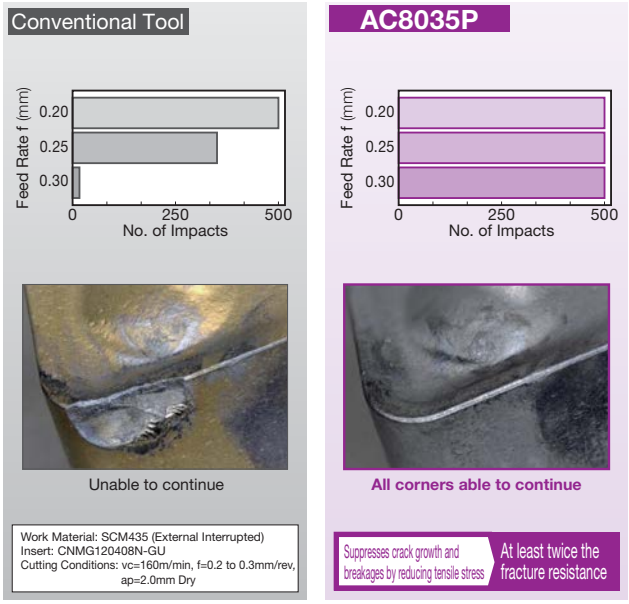
AC8025P

● Surface smoothing treatment significantly suppresses adhesion and chipping



AC8035P

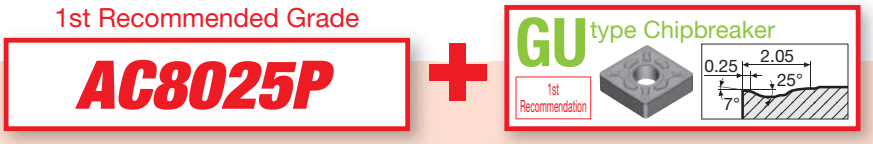
● Special surface treatment reduces tensile stress in the coating layer, significantly suppressing breakages



■ Application Guide

1st Recommended Grade

AC8025P + **GU** type Chipbreaker (1st Recommendation)



	Chipbreakers for High-efficiency Machining	Main Chipbreakers	Strong Cutting Edge Chipbreakers
Finishing to Small depth of Cut	FE type, SE type	SU type	SX type
General-purpose	GE type	GU type (1st Recommendation)	UX type
Roughing to Large Depth of Cut	ME type	MU type	MX type

For high-speed continuous machining of mild steel

High-speed Machining AC8015P

To improve tool life at small depths of cut	FE type
To improve finishing efficiency	SE type

For heavy interrupted cutting emphasizing stability

Interrupted Machining AC8035P

To improve tool life	GU type
To improve machining stability	UX type

For high-efficiency machining of hardened steel and forged material

High Efficiency AC8020P

To increase feed rate	GE type	To increase cutting speed	GU type

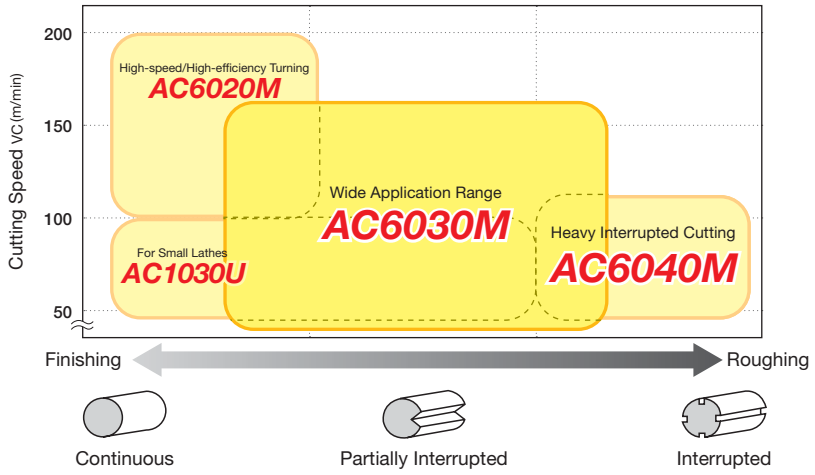
P Steel Recommended Cutting Conditions

(Red text indicates 1st recommendation.)

Work Material	Application	Chipbreaker	Grade	Cutting Conditions (Min. - **Optimum** - Max.)		
				Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Mild Steel Low Carbon Steel (SS400, S15C, etc.)	Fine Finishing	FB, FE	T1500Z	0.2-**0.6**-1.0	0.05-**0.15**-0.25	100-**250**-400
	Continuous	GU, GE	AC8015P	1.0-**2.5**-4.0	0.1-**0.25**-0.4	260-**350**-440
	General to Interrupted	**GU, GE**	**AC8025P**	1.0-**2.5**-4.0	0.2-**0.35**-0.5	200-**260**-320
	Heavy Interrupted	MU, ME	AC8035P	1.5-**4.0**-6.0	0.3-**0.45**-0.6	140-**150**-220
Medium to High Carbon Steel Alloy Steel Hard Steel (S45C, SCM435, SCM440H, etc.)	Fine Finishing	FB, FE	T1500Z	0.2-**0.6**-1.0	0.05-**0.15**-0.25	50-**200**-300
	Continuous to General	**GU, GE**	**AC8020P**	1.0-**2.5**-4.0	0.2-**0.35**-0.5	150-**235**-290
	Interrupted	GU, GE	AC8025P	1.0-**2.5**-4.0	0.2-**0.35**-0.5	130-**165**-230
	Heavy Interrupted	MU, ME	AC8035P	1.5-**4.0**-6.0	0.3-**0.45**-0.6	90-**135**-160

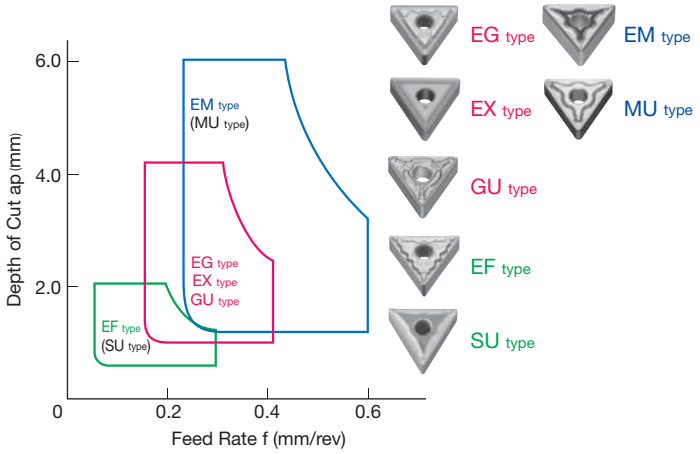
Stainless Steel M

Grades

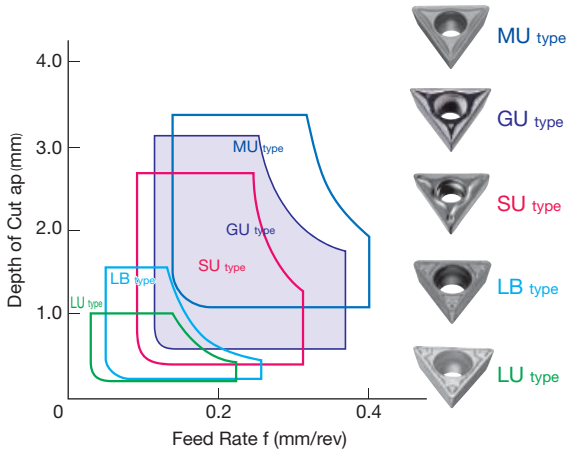


Chipbreakers

Negative type



Positive type



Refer to the Tools for Small Lathes chapter D7 for the Chipbreaker Selection Guide for ground (G Class) inserts.

Recommended Cutting Conditions

(Red text indicates 1st recommendation.)

Work Material			Application	Chipbreaker	Grade	Cutting Conditions Min. - **Optimum** - Max.		
						Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Cr-based	Ferritic	SUS405, SUS410L, SUS430, SUS430F, SUS434, SUS447FJ1	Finishing	EF(SU)	**AC6020M**	0.5-**1.5**-2.0	0.05-**0.15**-0.25	170-**230**-300
			Medium	EG/GU/EX	**AC6030M**	1.0-**2.5**-4.0	0.10-**0.25**-0.40	140-**170**-250
			Roughing	EM	**AC6040M**	1.5-**3.5**-6.0	0.20-**0.35**-0.60	140-**170**-200
	Martensitic	SUS403, SUS410, SUS420J2,SUS420F, SUS440F	Finishing	EF(SU)	**AC6020M**	0.5-**1.5**-2.0	0.05-**0.15**-0.25	120-**180**-240
			Medium	EG/GU/EX	**AC6030M**	1.0-**2.5**-4.0	0.10-**0.25**-0.40	100-**150**-200
			Roughing	EM	**AC6040M**	1.5-**3.5**-6.0	0.20-**0.35**-0.60	80-**130**-180
Cr/Ni-based	Austenitic	SUS304, SUS304L, SUS316, SUS316L, SUS303, SUS321	Finishing	EF(SU)	**AC6020M**	0.5-**1.5**-2.0	0.05-**0.15**-0.25	120-**180**-240
			Medium	EG/GU/EX	**AC6030M**	1.0-**2.5**-4.0	0.10-**0.25**-0.40	100-**150**-200
			Roughing	EM	**AC6040M**	1.5-**3.5**-6.0	0.20-**0.35**-0.60	80-**130**-180
	Duplex (Austenitic/ Ferritic)	SUS329J1, SUS329J3L, SUS329J4L	Finishing	EF(SU)	**AC6020M**	0.5-**1.5**-2.0	0.05-**0.15**-0.25	100-**145**-180
			Medium	EG/GU/EX	**AC6030M**	1.0-**2.5**-4.0	0.10-**0.25**-0.40	80-**120**-160
			Roughing	EM	**AC6040M**	1.5-**3.5**-6.0	0.20-**0.35**-0.60	70-**100**-140
	Deposition Hardened Structures	SUS630, SUS631, SUS632J1	Finishing	EF(SU)	**AC6020M**	0.5-**1.5**-2.0	0.05-**0.15**-0.25	90-**115**-140
			Medium	EG/GU/EX	**AC6030M**	1.0-**2.5**-4.0	0.10-**0.25**-0.40	70- **90**-130
			Roughing	EM	**AC6040M**	1.5-**3.5**-6.0	0.20-**0.35**-0.60	50- **80**-120

Stainless Steel M Stainless Steel

Grades

ABSOTECH AC6020M / ABSOTECH AC6030M / ABSOTECH AC6040M / ABSOTECH AC1030U

AC6020M: Combines a high-hardness carbide substrate with excellent wear resistance and a new CVD coating with improved coating strength to achieve both excellent wear resistance and fracture resistance. Achieves long, stable tool life during high-speed cutting.

AC6030M: Our 1st recommended grade for turning of stainless steel, achieving long and stable machining.
Drastically reduces the abnormal damage common in stainless steel machining, thanks to the improved coating strength and excellent adhesion.

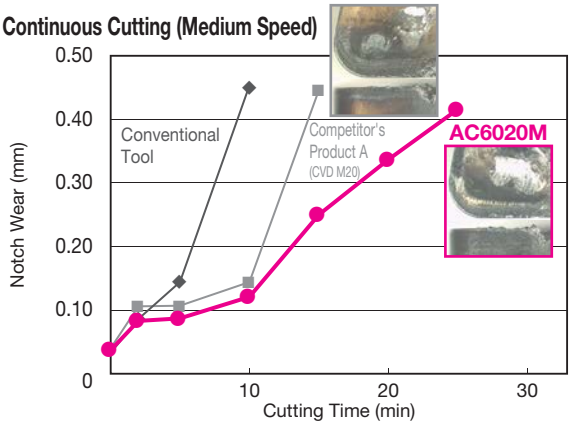
AC6040M: Drastically improves the reliability in the unstable cutting regions, thanks to the excellent adhesion and peel-off resistance of the new PVD coating, as well as the improved fracture resistance of the dedicated carbide substrate.

AC1030U: High-quality cutting edge suppresses adhesion and micro-chipping, realizing excellent machined surface quality.

Cutting Performance

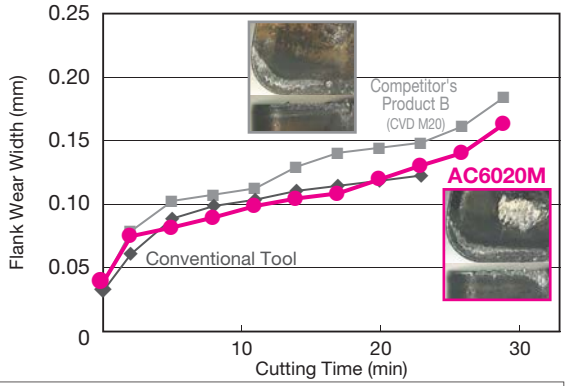
AC6020M

● Continuous Cutting (Medium Speed)



Work Material: SUS316L Insert: CNMG120408N-GU
Cutting Conditions: vc= 150m/min, f= 0.3mm/rev, ap= 2.0mm Wet

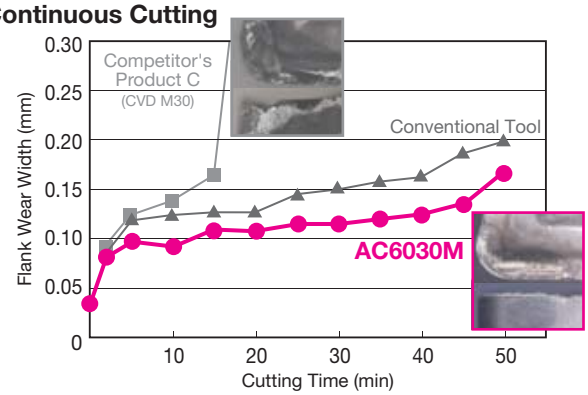
● Continuous Cutting (High Speed)



Work Material: SUS316L Insert: CNMG120408N-GU
Cutting Conditions: vc= 200m/min, f= 0.3mm/rev, ap= 2.0mm Wet

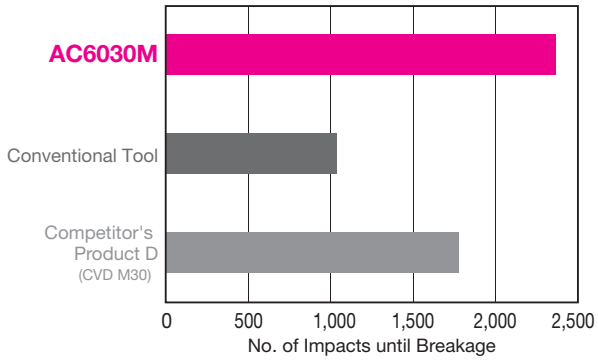
AC6030M

● Continuous Cutting



Work Material: SUS316 Insert: CNMG120408N-EX
Cutting Conditions: vc=200m/min, f=0.2mm/rev, ap=2.0mm Wet

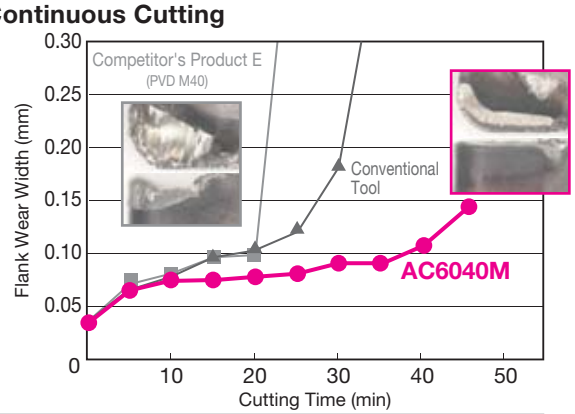
● Interrupted Cutting



Work Material: SUS316 Insert: CNMG120408N-GU
Cutting Conditions: vc=100m/min, f=0.1mm/rev, ap=1.0mm Wet

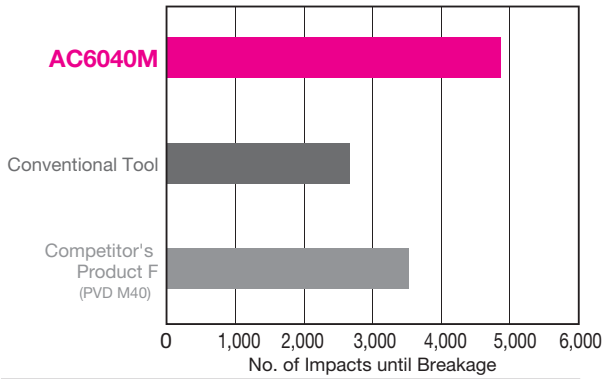
AC6040M

● Continuous Cutting



Work Material: SUS316 Insert: CNMG120408N-GU
Cutting Conditions: vc=150m/min, f=0.2mm/rev, ap=2.0mm Wet

● Interrupted Cutting

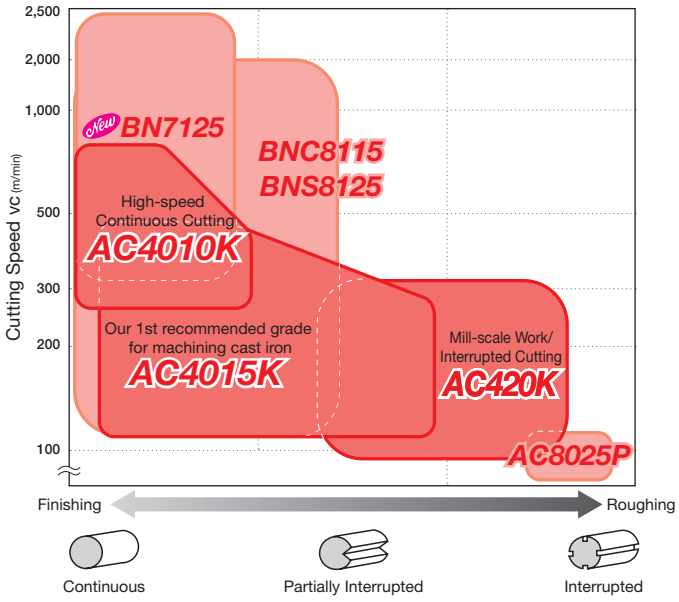


Work Material: SUS316 Insert: CNMG120408N-GU
Cutting Conditions: vc=230m/min, f=0.23mm/rev, ap=0.8mm Dry

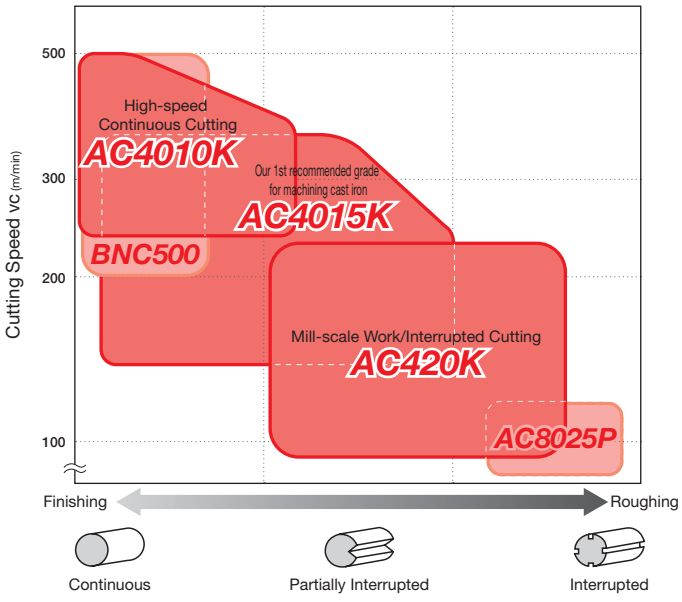
Grades

CBN Coated SUMIBORON BNC500 / SUMIBORON BN7125 / Solid SUMIBORON BNC8115 / Solid SUMIBORON BNS8125 ··· L7

● FC (Gray Cast Iron)

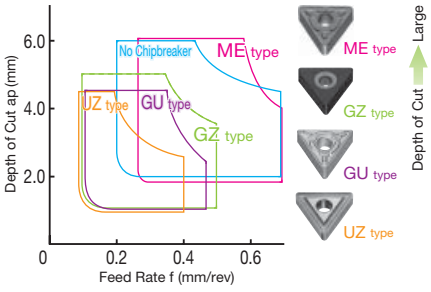


● FCD (Ductile Cast Iron)

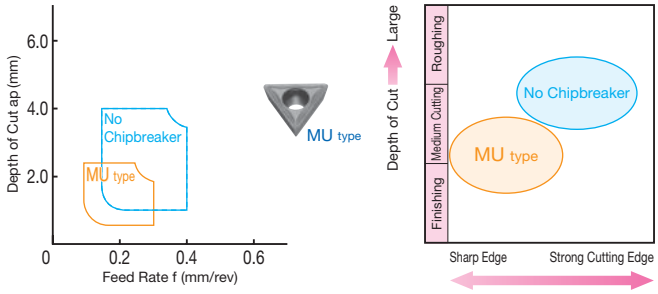


Chipbreakers

Negative type



Positive type



Recommended Cutting Conditions

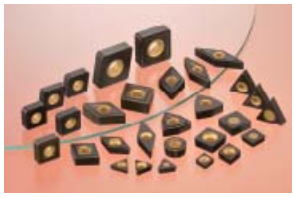
(Red text indicates 1st recommendation.)

Work Material	Application	Grade	Cutting Conditions Min. -Optimum- Max.		
			Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Gray Cast Iron (FC250, etc.)	High-speed	BN7125	0.1 - **0.3** - 1.0	0.10 - **0.20** - 0.50	500 - **1,500** - 2,000
	Continuous to General	**AC4010K**	0.5 - **2.0** - 6.0	0.10 - **0.25** - 0.40	200 - **400** - 700
	Interrupted	AC4015K	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.50	180 - **300** - 450
	Heavy Interrupted	AC420K	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.60	150 - **200** - 300
Ductile Cast Iron (FCD450, etc.)	High-speed	BNC500	0.1 - **0.2** - 0.5	0.10 - **0.20** - 0.40	150 - **350** - 500
	Continuous to General	AC4010K	0.5 - **2.0** - 6.0	0.10 - **0.25** - 0.40	180 - **300** - 450
	Interrupted	**AC4015K**	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.50	160 - **250** - 400
	Heavy Interrupted	AC420K	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.60	120 - **170** - 250
High-strength Ductile Cast Iron (FCD700, etc.)	High-speed	BNC500	0.1 - **0.2** - 0.5	0.10 - **0.20** - 0.40	200 - **350** - 500
	Continuous to General	AC4010K	0.5 - **2.0** - 6.0	0.10 - **0.25** - 0.40	160 - **250** - 400
	Interrupted	**AC4015K**	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.50	140 - **200** - 350
	Heavy Interrupted	AC420K	0.5 - **2.0** - 6.0	0.10 - **0.30** - 0.60	80 - **150** - 220

Grades

ABSOTECH AC4010K / ABSOTECH AC4015K / AC420K

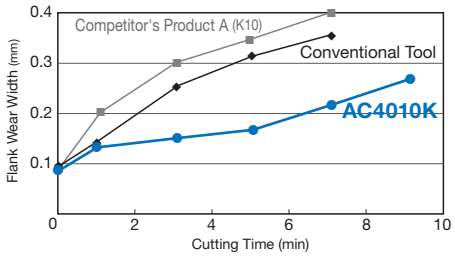
AC4010K: Our 1st recommended grade for machining gray cast iron.
New ultra-thick CVD coating enables vc= 700m/min ultra-high-speed machining.
AC4015K: Our 1st recommended grade for ductile cast iron.
New high-adhesion, high-strength CVD coating realises both wear resistance and chipping resistance.
AC420K: Superior fracture resistance, providing excellent stability in unstable or interrupted cutting and when turning mill-scaled work.

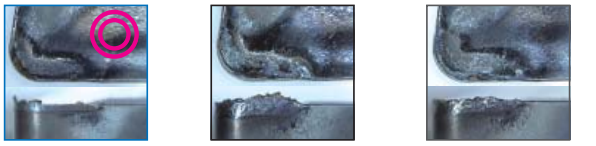


Cutting Performance

AC4010K/AC4015K Wear Resistance

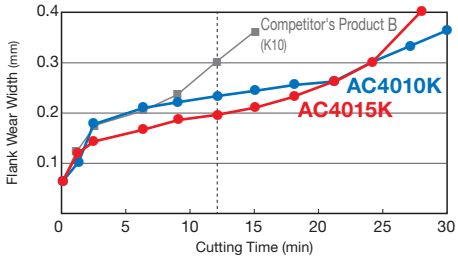
● Gray Cast Iron





Work Material: FC250 Continuous Insert: CNMG120408N-GZ
Cutting Conditions: vc= 600m/min, f= 0.4mm/rev, ap= 2.0mm Dry

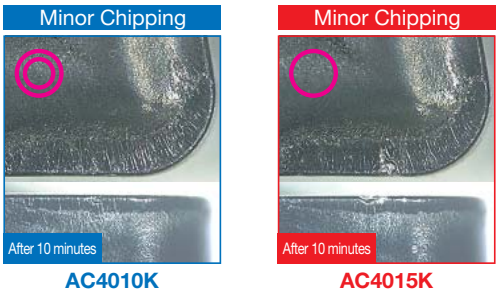
● Ductile Cast Iron



Work Material: FCD700 Continuous Insert: CNMG120408N-GZ
Cutting Conditions: vc= 140m/min, f= 0.3mm/rev, ap= 1.5mm Wet

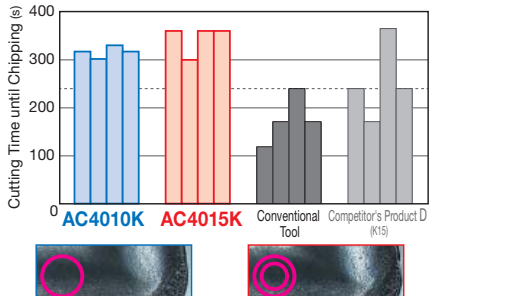
AC4010K/AC4015K Chipping Resistance

● Gray Cast Iron



Work Material: FC250 Interrupted Insert: CNMG120408N-GZ
Cutting Conditions: vc= 400m/min, f= 0.3mm/rev, ap= 2.0mm Wet

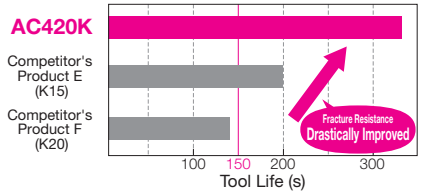
● Ductile Cast Iron



Work Material: FCD450 Interrupted Insert: CNMG120408N-GZ
Cutting Conditions: vc= 450m/min, f= 0.3mm/rev, ap= 1.5mm Wet

AC420K Fracture Resistance

FCD450 Grooved (Heavy Interrupted Acceleration Test)



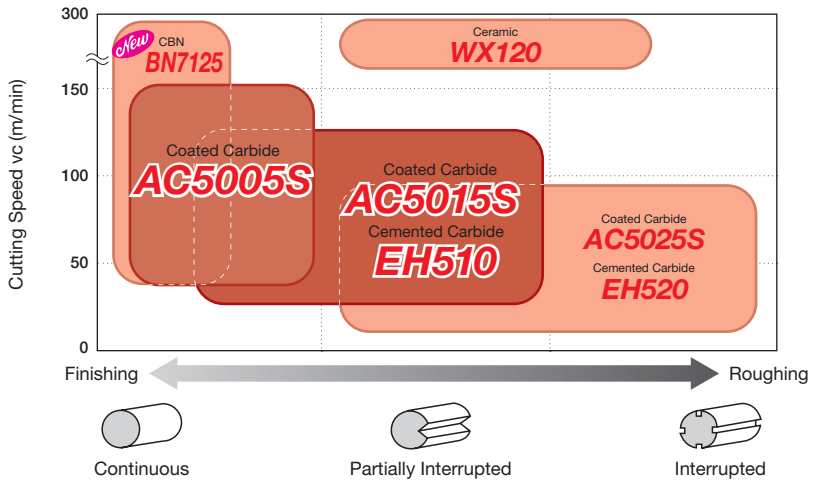
Edge Wear Comparison (After 150s)

Work Material: FCD450 Interrupted Insert: CNMG120408N-GZ
Cutting Conditions: vc=350m/min, f=0.25mm/rev, ap=1.5mm Wet

Exotic Alloy

Grades

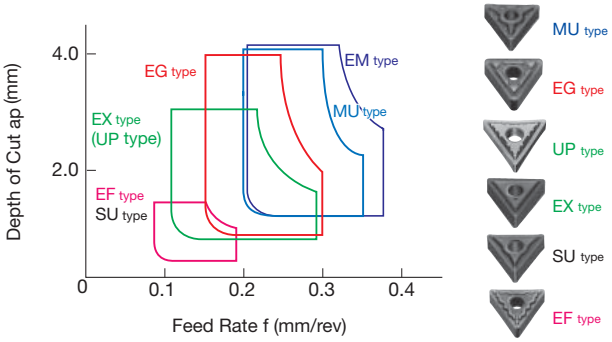
SUMIBORON BN7125 ••• L10



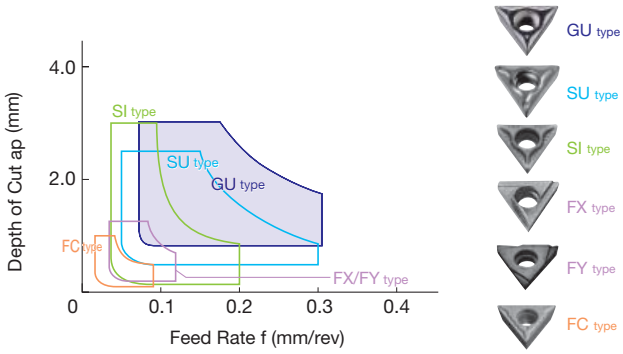
★WX120 is only sold in Japan.

Chipbreakers

Negative type



Positive type



Recommended Cutting Conditions

(Red text indicates 1st recommendation.)

Work Material	Application	Chipbreaker	Grade	Cutting Conditions (Min. - **Optimum** - Max.)		
				Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Heat-Resistant Alloy (Ni-based Material, Fe-based Material, Co-based Material)	Finishing	EF	AC5005S AC5015S AC5025S	0.2-**0.5**-1.5	0.10-**0.12**-0.20	50-**70**-110
	Light	EX	AC5005S AC5015S AC5025S	0.5-**1.0**-3.0	0.10-**0.20**-0.30	40-**60**-90
	Medium	EG	AC5005S AC5015S AC5025S	0.5-**2.0**-4.0	0.15-**0.25**-0.30	40-**60**-90
	Roughing	MU/EM	AC5015S AC5025S	1.0-**2.0**-4.0	0.20-**0.25**-0.40	30-**55**-80
Titanium Alloy (Pure Titanium (99.5%), α + β Alloy)	Finishing	EF(SU)	EH510 (AC5005S, AC5015S)	0.2-**0.5**-1.5	0.1-**0.15**-0.2	50-**65**-80
	Light	EX	AC5005S, AC5015S	0.5-**1.0**-2.5	0.1-**0.20**-0.25	40-**55**-70
	Medium	EG	EH510 (AC5005S, AC5015S)	0.5-**2.0**-3.5	0.15-**0.25**-0.3	40-**55**-70
	Roughing	MU/EM	AC5025S	1.0-**2.0**-3.5	0.2-**0.25**-0.3	30-**40**-50

Grades

ABSOTECH ABSOTECH ABSOTECH

AC5005S / AC5015S / AC5025S / EH510 / EH520

- New PVD coated grades with excellent wear and thermal resistance

AC5005S: High-speed, high-efficiency grade with excellent high-thermal strength and outstanding wear resistance in high-efficiency turning.
AC5015S: Our 1st recommended grade for turning exotic alloys as it realises stable tool life in high-speed, high-efficiency machining.
AC5025S: High-toughness grade that achieves stable and long tool life in interrupted cutting and turning mill-scaled work.

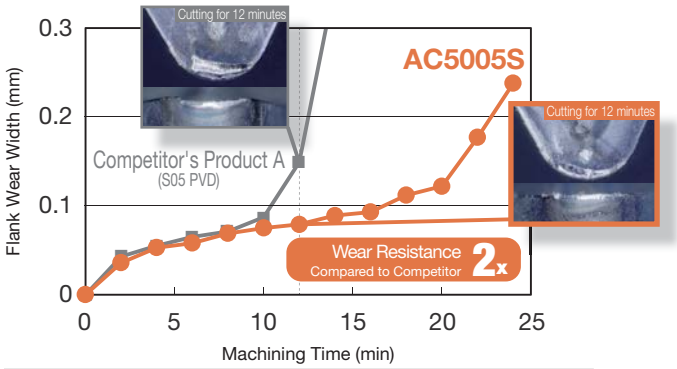
- Dedicated cemented carbide grades with excellent thermal, wear and fracture resistance for machining titanium alloys

EH510: General-purpose grade for titanium machining that features excellent wear and thermal resistance. For applications from roughing to finishing.
EH520: Tough grade for titanium machining with excellent fracture and thermal resistance.
Perfect for interrupted cutting and turning mill-scaled work.

Cutting Performance

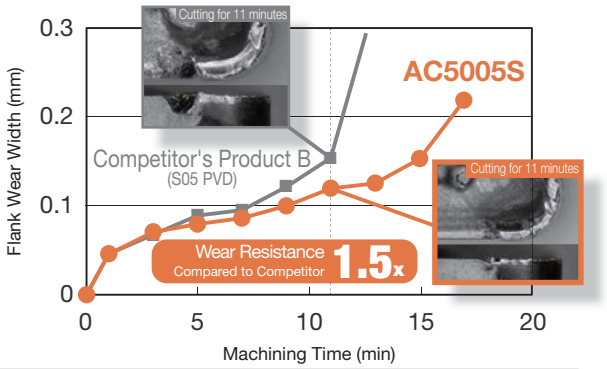
AC5005S

- Wear Resistance (High-speed)



Work Material: Inconel 718 (44HRC) Insert: DNMG150408
Cutting Conditions: vc= 100m/min, f= 0.15mm/rev, ap= 0.5mm, Wet

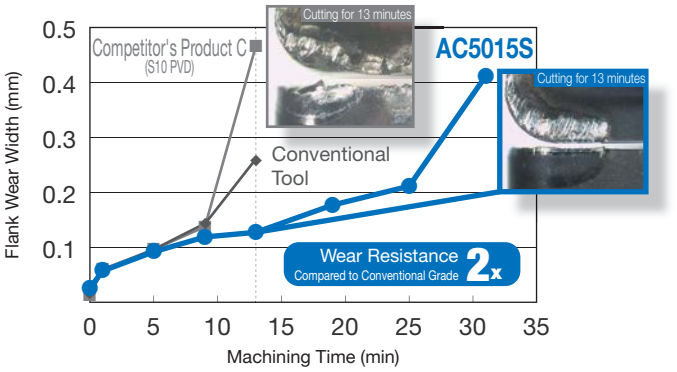
- Wear Resistance (High-feed)



Work Material: Inconel 718 (44HRC) Insert: CNMG120408
Cutting Conditions: vc= 50m/min, f= 0.25mm/rev, ap= 1.5mm, Wet

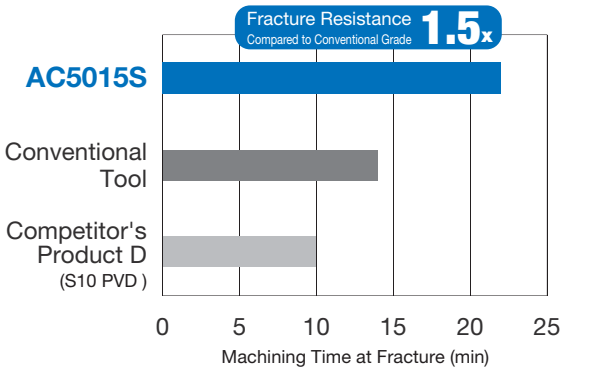
AC5015S

- Wear Resistance



Work Material: Inconel 718 (44HRC) Insert: CNMG120408
Cutting Conditions: vc= 40m/min, f= 0.1mm/rev, ap= 1.5mm Wet

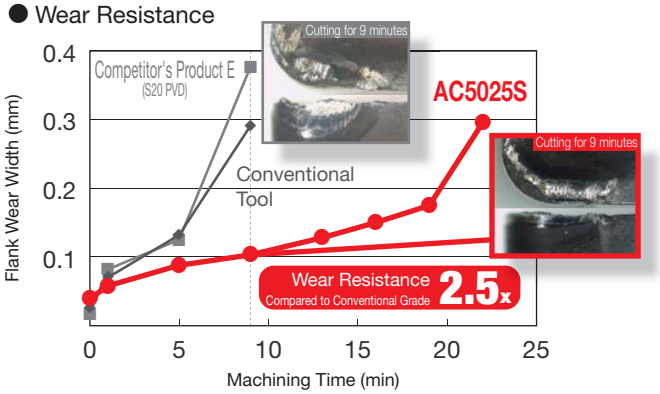
- Fracture Resistance



Work Material: Hastelloy (22HRC) Insert: CNMG120408
Cutting Conditions: vc= 50m/min, f= 0.1mm/rev, ap= 1.5mm Wet

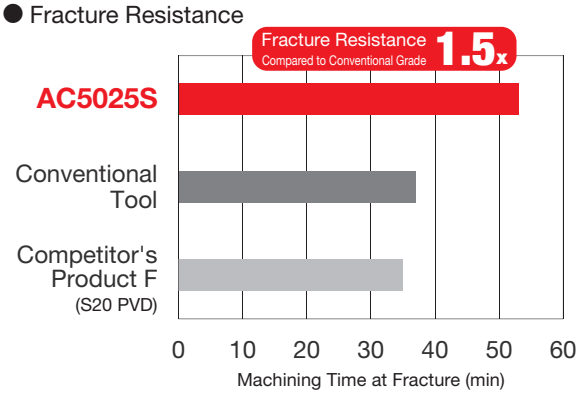
AC5025S

- Wear Resistance



Work Material: Inconel 718 (44HRC) Insert: CNMG120408
Cutting Conditions: vc= 40m/min, f= 0.1mm/rev, ap= 1.5mm Wet

- Fracture Resistance

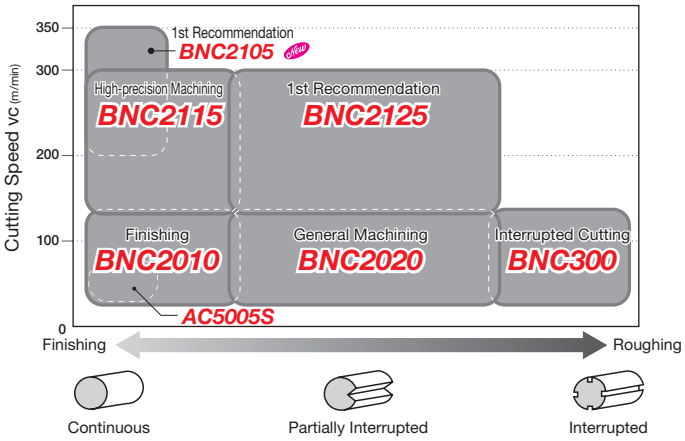


Work Material: Hastelloy (22HRC) Insert: CNMG120408
Cutting Conditions: vc= 50m/min, f= 0.1mm/rev, ap= 1.5mm Wet

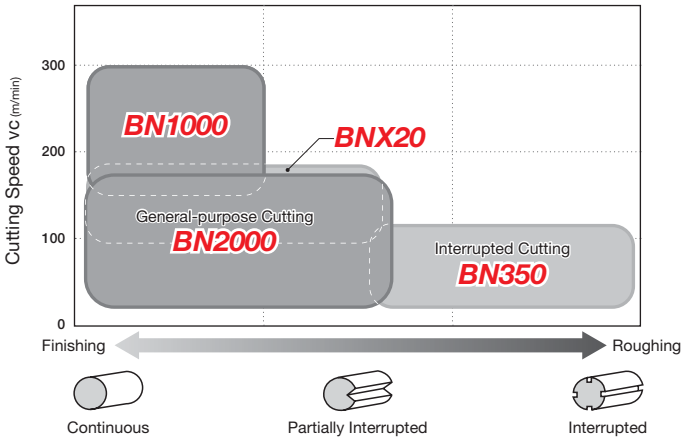
Hardened Steel

Grades

● Coated SUMIBORON, Coated Carbide



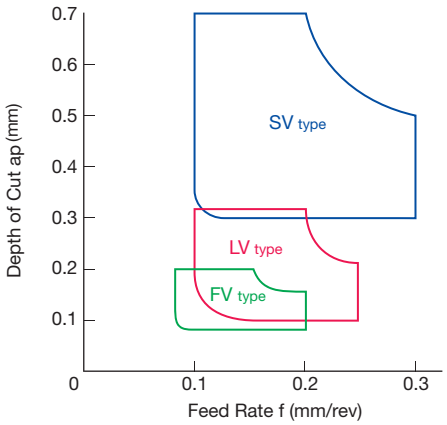
● Uncoated SUMIBORON

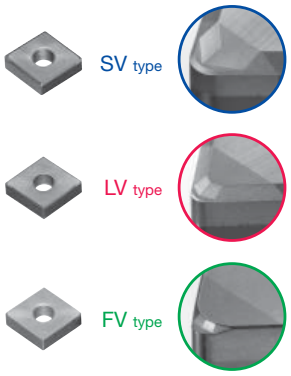


CBN SUMIBORON••• L2

Chipbreakers

LV type/FV type Chipbreaker: For chip control during hardened steel finishing
SV type Chipbreaker: For chip control during carburised layer removal





CBN SUMIBORON BREAK MASTER ••• L30

Recommended Cutting Conditions

(Red text indicates 1st recommendation.)

Application	Grade	Cutting Conditions (Min. - **Optimum** - Max.)		
		Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Continuous	**BNC2105**	0.03-**0.15**-0.20	0.03-**0.10**-0.15	150-**200**-350
	BNC2115	0.03-**0.20**-0.35	0.03-**0.10**-0.20	110-**180**-300
	BNC2010	0.03-**0.20**-0.35	0.03-**0.10**-0.20	50-**140**-180
	BN1000	0.03-**0.15**-0.20	0.03-**0.10**-0.15	120-**180**-300
	AC5005S	0.03-**0.50**-1.00	0.02-**0.05**-0.10	40- **70**-100
General	**BNC2125**	0.05-**0.30**-0.50	0.05-**0.20**-0.40	110-**160**-300
	BNC2020	0.05-**0.30**-0.50	0.03-**0.20**-0.40	50-**120**-180
	BN2000	0.03-**0.20**-0.30	0.03-**0.10**-0.20	30-**100**-200
	BNX20	0.03-**0.30**-0.50	0.03-**0.15**-0.30	70-**130**-170
Interrupted	**BNC300**	0.03-**0.20**-0.30	0.03-**0.10**-0.20	50-**100**-150
	BN350	0.03-**0.20**-0.30	0.03-**0.10**-0.20	50-**100**-150

Grades

NEW BNC2105 / BNC2115 / BNC2125 / BN1000 / BN2000

BNC2105 / BNC2115 / BNC2125

BNC2105: Grade for high-speed finishing.
Stable performance in high-speed machining of hardened steel, thanks to outstanding wear resistance.

BNC2115: High-precision grade realizing long tool life with excellent surface roughness and stable machining.
Maintains excellent surface roughness thanks to a coating with high notch wear resistance and tough CBN substrate.

BNC2125: 1st recommended grade, balancing excellent wear resistance and fracture resistance in hardened steel machining.
Along with a tough CBN substrate, the coating combines wear resistance and toughness to achieve long, stable tool life even in high-efficiency and interrupted machining.

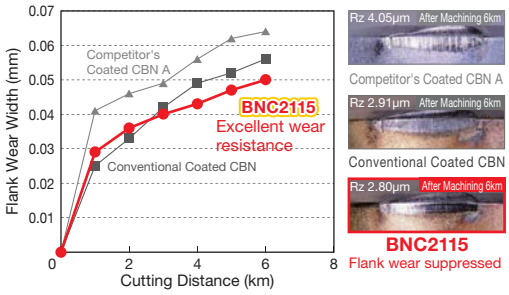
BN1000: For high-speed machining, BN1000 provides the highest wear resistance of all uncoated SUMIBORON grades, improving fracture resistance while maintaining an emphasis on wear resistance.

BN2000: General-purpose grade for general hardened steel machining with a high degree of fracture and wear resistance.

Cutting Performance

BNC2115

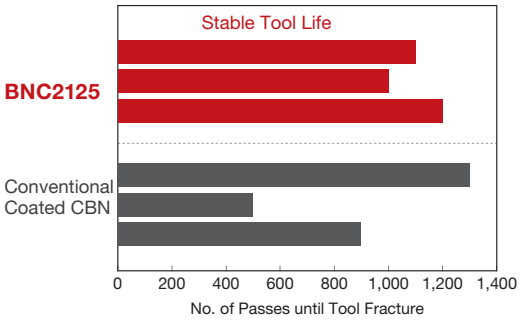
● Wear Resistance (Continuous Cutting)



Work Material: SCM415H (58 to 62HRC)
Tool Cat. No.: 4NC-DNGA150408
Cutting Conditions: vc= 200m/min, f= 0.1mm/rev, ap= 0.15mm Wet

BNC2125

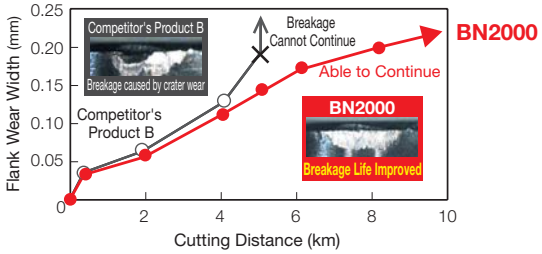
● Fracture Resistance (High-load Cutting)



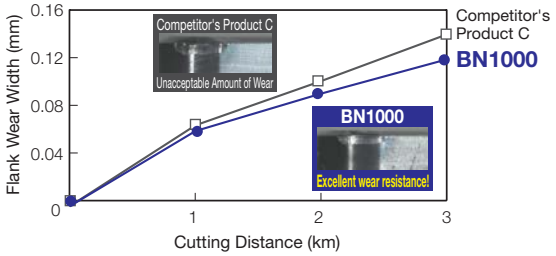
Work Material: SUJ2 (58 to 62HRC)
Tool Cat. No.: 4NC-DNGA150408
Cutting Conditions: vc= 150m/min, f= 0.15mm/rev, ap= 0.5mm, 63m/times Wet

BN1000 / BN2000

● Wear Resistance (Continuous Cutting)

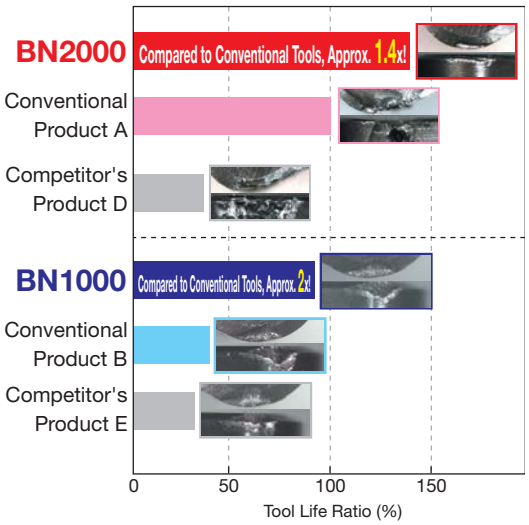


Work Material: SCM415H Round Bar (58 to 62HRC)
Insert: 2NU-CNGA120408
Cutting Conditions: v_c=100m/min, f=0.1mm/rev, a_p=0.2mm Dry



Work Material: SUJ2 Round Bar (62HRC)
Insert: 2NU-CNGA120408
Cutting Conditions: v_c=150m/min, f=0.1mm/rev, a_p=0.2mm Dry

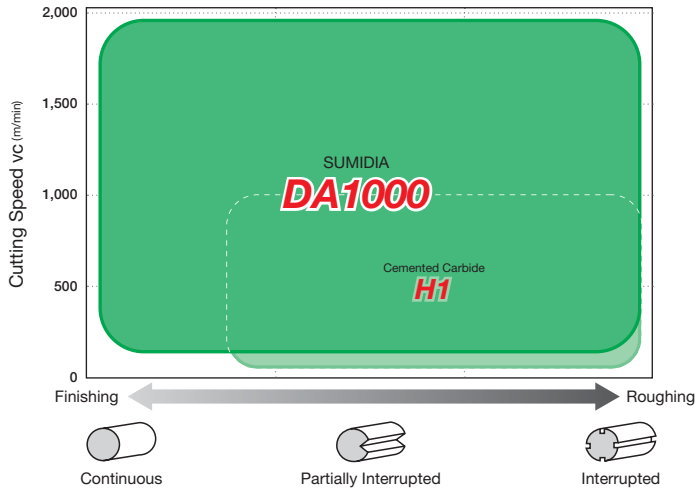
● Chipping Resistance (Interrupted Cutting)
(Conventional Tool A as 100%)



Work Material: SCM415H 8V Grooved (58-62HRC)
Insert: 2NU-CNGA120408
Cutting Conditions: v_c=150m/min, f=0.1mm/rev, a_p=0.2mm Dry

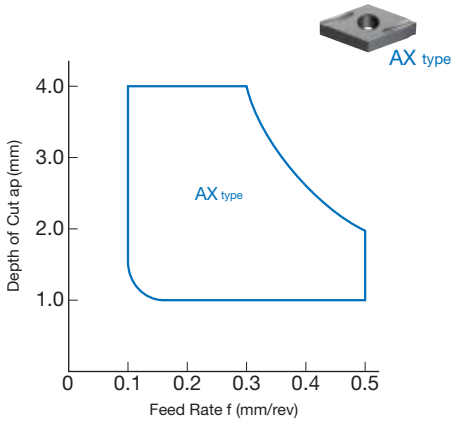
Grades

PCD SUMIDIA DA1000 ••• M6

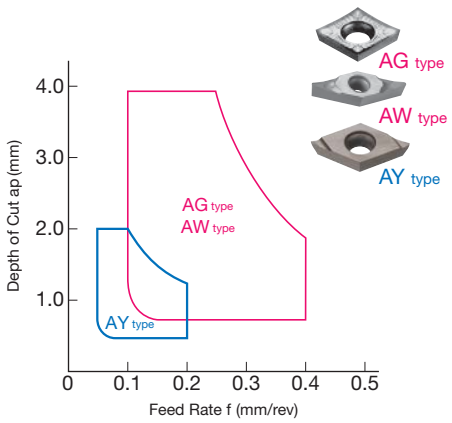


Main Chipbreakers

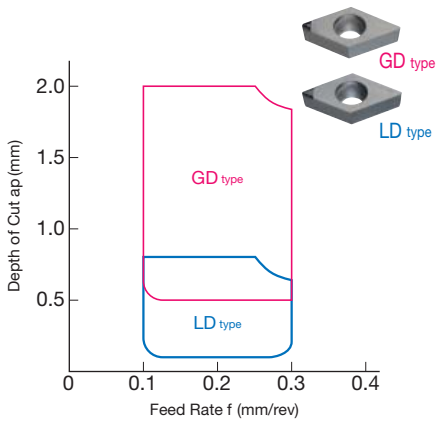
Negative type



Positive type



Positive type (PCD)



Recommended Cutting Conditions

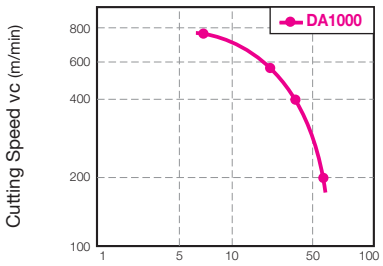
Application	Series	Grade	Cutting Conditions (Min. - **Optimum** - Max.)		
			Depth of Cut ap (mm)	Feed Rate f (mm/rev)	Cutting Speed vc (m/min)
Continuous General Interrupted	SUMIDIA	**DA1000**	0.1-**0.5**-3.0	0.05-**0.10**-0.20	up to 2,000
	Cemented Carbide	**H1**	0.3-**1.0**-5.0	0.1-**0.20**-0.5	up to 1,000

Grades DA1000

- Ultra-high-density sintered ultra-fine grained diamond
- Significantly improved surface roughness on machined surfaces
- World's highest wear resistance and strength
- Suitable for use on a wide variety of aluminum and non-ferrous alloys

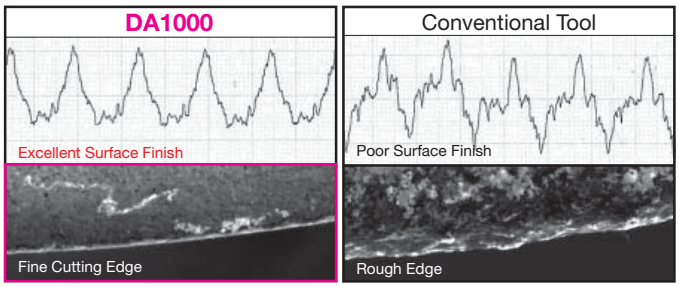
Cutting Performance

● Wear Resistance



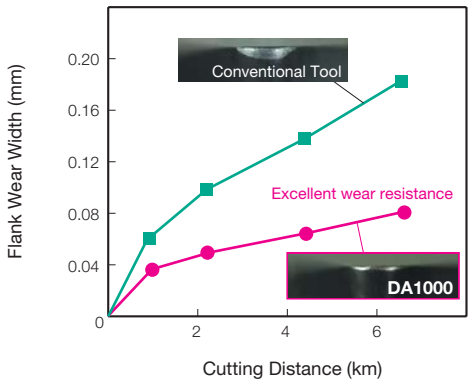
Work Material: 17% Si-Al Alloy
Insert: TPGN160304
Cutting Conditions: vc= 200 to 800m/min, f= 0.12mm/rev, ap= 0.5mm Wet

● Cutting Edge Surface Roughness Comparison



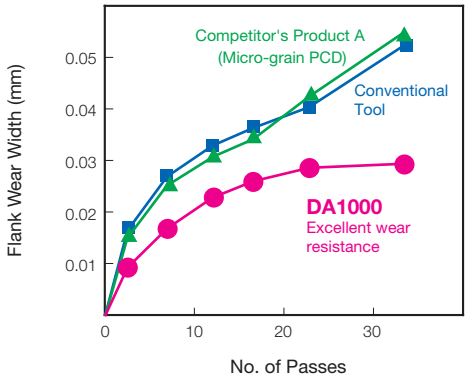
Work Material: 17% Si-Al Alloy
Insert: TPGW160308
Cutting Conditions: vc=1,000m/min, f=0.15mm/rev, ap=0.2mm Wet

● Wear Resistance in Turning Applications



Work Material: 17% Si-Al Alloy
Insert: TPGN160304
Cutting Conditions: vc=800m/min, f=0.12mm/rev, ap=0.5mm Wet

● Wear Resistance in Milling Applications



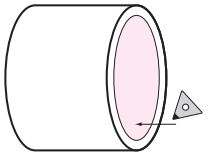
Work Material: ADC12 (12% Si-Al Alloy)
Insert: NF-SNEW1204ADFR
Cutting Conditions: vc=2,000m/min, f=0.15mm/rev, ap=3.0mm Wet

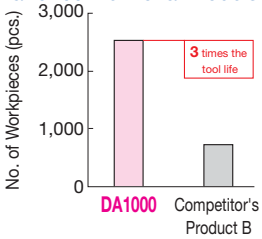
Application Examples

DA1000

[Copper Alloy Bushing]

Stable surface roughness with no cutting edge breakage (3.2S).
Tool life improved to 3 times that of conventional models.



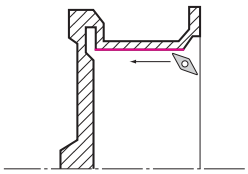


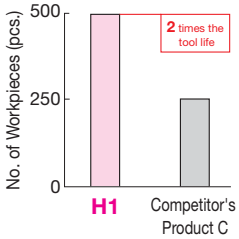
Insert: NF-TPGN160308
Cutting Conditions: vc=300m/min, f=0.07mm/rev, ap=0.08mm Wet

H1

[ADC12 Aluminum Wheel]

Excellent adhesion resistance.
Longer tool life.





Insert: VCGT160408N-AG
Cutting Conditions: vc=2,200m/min, f=0.25mm/rev. ap=2.0mm Wet

Chipbreaker and Grade Selection Guide for Turning

For Small Lathes

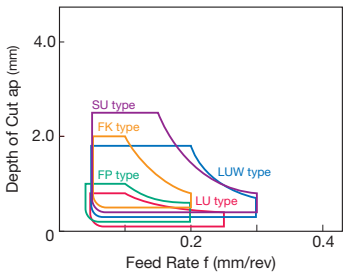
Grades

Insert Grade	Application Range: High-precision	Application Range: Finishing to Light Cutting	Application Range: Medium Cutting	P General Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	S Heat-Resistant Alloy	H Hardened Steel
Coated Carbide (PVD)	ACZ150	ACZ150	ACZ150	◎	◎		○		
	AC5015S	AC5015S		○	◎	○		◎	
	AC5025S	AC5025S		○	◎	○		◎	
	AC530U	AC530U		◎	◎	○	○	○	
	AC1030U	AC1030U		◎	◎	○	○	○	
Uncoated Cermet Coated Cermet	T1000A	T1000A		◎	○	◎	○		
	T1500A/T1500Z	T1500A/T1500Z		◎	○	○	○		
Cemented Carbide	BL130	BL130		○	○	○	○		
	H1	H1	H1	○	○	○	◎		
	EH510	EH510	EH510	○	○	○	○	◎	
CBN (SUMIBORON)	BN1000/BN2000	BN1000/BN2000	BN1000/BN2000						◎
	New BN7125	New BN7125	New BN7125			◎		○	
PCD (SUMIDIA)	DA1000	DA1000	DA1000				◎		

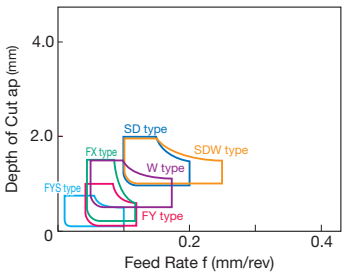
◎ 1st Recommendation ○ 2nd Recommendation

Chipbreakers

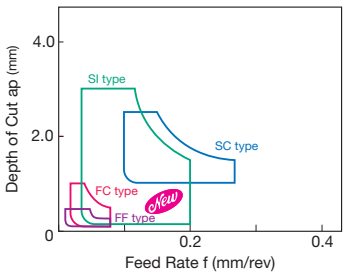
● M Class Finishing to Light Cutting



● G Class Ground type



● G Class Chipbreaker



Recommended Cutting Conditions

(Red text: 1st Recommendation Blue text: 2nd Recommendation)

Work Material / Insert Grade	P Free-Cutting Steel vc (m/min)	P Free-Cutting Steel f (mm/rev)	P Carbon Steel vc (m/min)	P Carbon Steel f (mm/rev)	M Stainless Steel vc (m/min)	M Stainless Steel f (mm/rev)	S Heat-Resistant Alloy vc (m/min)	S Heat-Resistant Alloy f (mm/rev)	H Hardened Steel vc (m/min)	H Hardened Steel f (mm/rev)	N Aluminum Alloy vc (m/min)	N Aluminum Alloy f (mm/rev)	N Brass vc (m/min)	N Brass f (mm/rev)
ACZ150	50 to 200	0.02 to 0.10	50 to 150	0.01 to 0.08	50 to 150	0.01 to 0.05					70 to 300	0.05 to 0.20	70 to 300	0.05 to 0.20
AC5015S	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 200	0.02 to 0.10	30 to 100	0.02 to 0.10					70 to 300	0.05 to 0.20
AC5025S	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 200	0.02 to 0.10	30 to 100	0.02 to 0.10					70 to 300	0.05 to 0.20
AC530U	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 200	0.02 to 0.10							70 to 300	0.05 to 0.20
AC1030U	50 to 200	0.02 to 0.15	50 to 150	0.02 to 0.10	50 to 150	0.02 to 0.10							70 to 300	0.05 to 0.20
T1000A	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 150	0.02 to 0.10					70 to 300	0.05 to 0.20	70 to 300	0.05 to 0.20
T1500A	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 150	0.02 to 0.10					70 to 300	0.05 to 0.20	70 to 300	0.05 to 0.20
T1500Z	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 150	0.02 to 0.10					70 to 300	0.05 to 0.20	70 to 300	0.05 to 0.20
BN1000									120 to 300	0.03 to 0.15				
BN2000									50 to 200	0.03 to 0.20				
BN7125							50 to 200	0.05 to 0.25						
DA1000											70 to 300	0.02 to 0.10	70 to 300	0.02 to 0.10

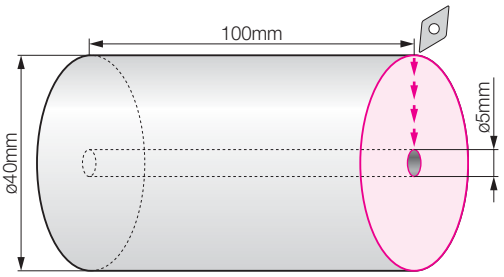
Grades

ABSOTECH
AC1030U

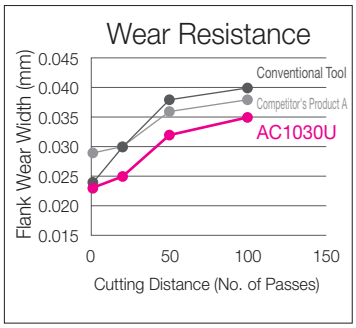
Employs a new PVD coating, and a dedicated tough carbide substrate.
High-quality cutting edge suppresses adhesion and micro-chipping, realizing excellent machined surface quality.

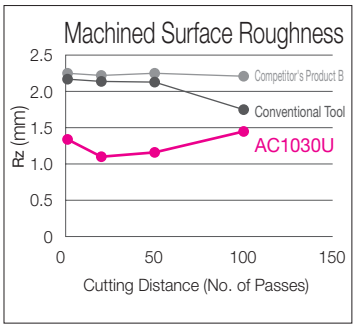
Cutting Performance

AC1030U



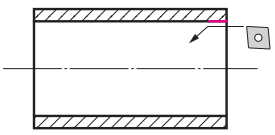
Work Material: SUS304 Insert: DCGT11T302R-FY
Cutting Conditions: vc= 100m/min, f= 0.05mm/rev, ap=0.1mm Wet (oil-based)

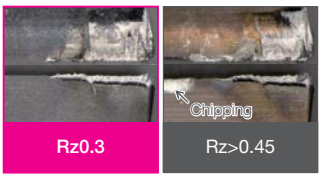




Application Examples

[STKM12C-EC Pipe]

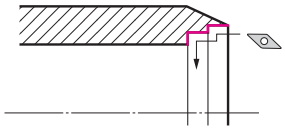


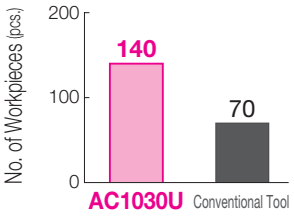


AC1030U (1,700pcs.) Conventional Tool (1,650pcs.)

Insert: CCGT060201L-FX
Cutting Conditions: vc=196m/min, f=0.04mm/rev, ap=0.4mm Wet

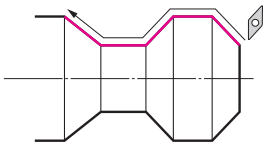
[S45C Shaft Stator]

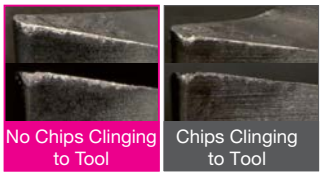




Insert: VCGT110302R-FX
Cutting Conditions: vc=195m/min, f=0.12mm/rev, ap=0.175 to 0.25mm Wet

[SUS304 Body Valve]

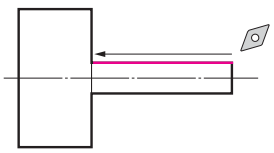


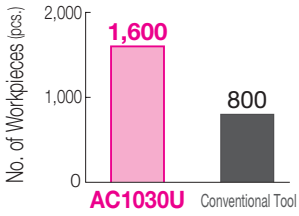


AC1030U (1,500pcs.) Competitor's Product C (1,000pcs.)

Insert: VCGT110301R-FY
Cutting Conditions: vc=131.5m/min, f=0.025mm/rev, ap=0.2mm Wet

[SUS430 Sensor Housing]





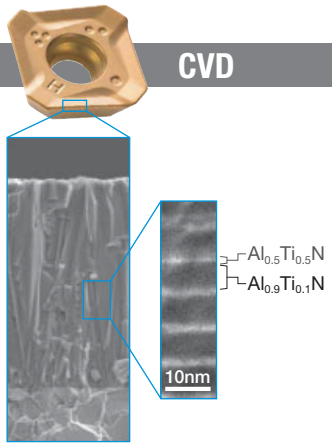
Insert: DCGT11T304MN-FC
Cutting Conditions: vc=150m/min, f=0.06mm/rev, ap=0.2mm Wet

Coated Carbide

Features

ABSOTECH X : Revolutionary coating technology that realises superb tool life

CVD



Pure cubic crystal AlTiN with high Al content:
With proprietary structural control technology, differently composed layers of AlTiN are stacked at the nanometre level.
With a high-Al composition containing over 80% Al on average, it also maintains a cubic crystalline structure to achieve excellent thermal resistance and high hardness. Vastly improved wear resistance.

Special Surface Treatment:
Proprietary surface treatment introduces high compression stress to the coating, suppressing the development of cracks. Greatly improved fracture and thermal crack resistance.

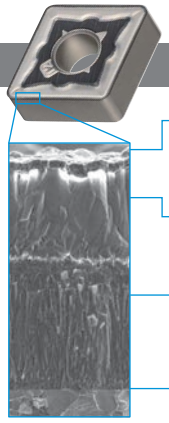
- Realises extremely long tool life for general machining through high-efficiency machining, using revolutionary technology combining wear resistance and fracture resistance

[ABSOTECH X] For CVD Milling

■ Applicable Grades (for Milling): XCS2000, XCU2500, XCK2000

ABSOTECH : New coating technology that realises absolute stability

CVD



Special Surface Treatment:
Chipping resistance and adhesion resistance are significantly improved by special surface treatments applied to suit the application

High Strength Alumina Layer:
Significantly improves the coating strength by controlling crystal growth direction

High Hardness Micro-Grain TiCN Layer:
Significantly improves the coating hardness by using a fine and uniform crystal structure

High Adhesion Technology:
Significantly improves adhesion strength through a smooth interface between the coating and carbide substrate

- Suppresses abnormal damage such as chipping and adhesion. Stable machining is achieved in various situations.
- Next-level high strength and high hardness coating is achieved. Achieves long, stable tool life even in high-efficiency machining.

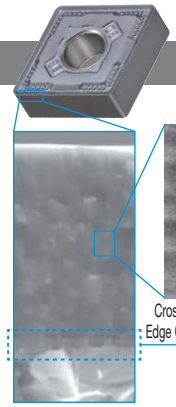
[ABSOTECH] For CVD Turning

■ Applicable Grades (For Turning)

Steel	: AC8015P, AC8020P, AC8025P, AC8035P
Stainless Steel	: AC6020M, AC6030M
Cast Iron	: AC4010K, AC4015K

■ Applicable Grades (For Milling) : ACP2000, ACK2000

PVD



Our proprietary super multi-layered coating structure: Advanced nanotechnology enables nanometre-level thickness (1 nanometre is one billionth of a metre). Hardness, thermal resistance and toughness are significantly improved by alternately layering one thousand layers of super thin film

High Adhesion Technology:
Significantly improves adhesion strength through advanced control technology at the interface of the coating and carbide substrate

- Optimised coating composition according to application. Achieves stable machining regardless of the work material.
- Significantly improves chipping resistance by improving coating adhesion strength. Stable machining is realised even under high load conditions.

[ABSOTECH] For PVD Turning/Milling

■ Applicable Grades (For Turning)

Stainless Steel	: AC6040M
Exotic Alloy	: AC5005S, AC5015S, AC5025S
For Small Lathes	: AC1030U

■ Applicable Grades (For Milling) : ACS2500, ACS3000, ACU2500, ACP3000, ACK3000

Brilliant Coat — PVD

Brilliant Coat provides excellent lubricity for higher quality machining

- PVD coating with excellent wear resistance and lubricity
- Suppresses reactions with work material and realises beautiful machined surfaces

Brilliant Coat

Conventional coating

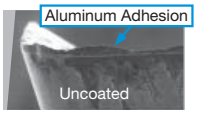
Work Material: STKM13A
Insert: CNMG120408N-LU
Cutting Conditions: vc= 100m/min
f= 0.15 mm/rev
ap= 1.0mm Wet

■ Applicable Grades: (For Turning) T1500Z, T2500Z

AURORA Coat (DLC:DiamondLikeCarbon) — PVD

Using our proprietary PVD process technology, we have developed a hydrogen-free DLC coating that is extremely hard, flat and smooth

- Comparison of Cutting Edge Adhesion after Cutting ADC12



Work Material: ADC12
Cutting Conditions: vc = 300m/min
fz = 0.15mm/t
ap = 5mm
ae = 5mm Dry

- Second only to diamond in terms of hardness, this flat and smooth coating has a low coefficient of friction and provides excellent adhesion resistance to deliver better quality machined surfaces
- Can be used for high-speed, high-efficiency cutting of aluminum alloys, copper alloys, resins and more

■ Applicable Grades: (For Milling) DL1000, DL2000 (For Endmilling) DL1000, DL1200 (For Drilling) DL1300, DL1500

Coated Carbide

Characteristic Values

For Turning (CVD)

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grades
P Steel	**AC810P**	91.0	2.2	Super FF Coat	18	· For high-speed and high-efficiency machining of steel · Grade emphasising wear resistance for high- to medium-speed cutting	AC700G
	AC8015P	91.0	2.3	ABSOTECH	14	· For high-speed and high-efficiency machining of steel · Crystal orientation control technology is used to drastically suppress the advancement of crater wear, achieving long, stable tool life during high-speed and high feed cutting	AC810P
	AC820P	90.1	2.2	Super FF Coat	14	· General-purpose grade with a superior balance of fracture and wear resistance	AC2000
	AC8020P	90.5	2.2	ABSOTECH	18	· Our 1st recommended grade for turning mill-scale on forged material · Alumina coating with even higher strength balances outstanding stability and wear resistance in turning mill-scale work	AC820P
	AC8025P	90.1	2.3	ABSOTECH	12	· Our 1st recommended grade for turning steel · Smooth surface treatment suppresses abnormal damage from adhesion/chipping while realizing stable tool life over a wide range of work materials and cutting speeds	AC820P
	AC830P	89.4	2.6	Super FF Coat	8	· For interrupted machining of steel · Tough grade with an emphasis on fracture resistance	AC3000
	AC8035P	89.4	2.6	ABSOTECH	9	· For interrupted machining of steel · Coating layer tensile stress removal technology greatly improves fracture resistance and achieves long, stable tool life during heavy interrupted cutting	AC830P
M Stainless Steel	**AC610M**	91.0	2.2	Super FF Coat	5	· For high-speed machining of stainless steel · Grade emphasising wear resistance for high-efficiency machining	—
	AC6020M	90.1	2.3	ABSOTECH	5	· For high-speed machining of stainless steel · Adopts a high-hardness carbide substrate and new coating to realise excellent wear resistance and fracture resistance, resulting in stable long tool life in high-speed machining	AC610M
	AC6030M	89.5	2.7	ABSOTECH	5	· Our 1st recommended grade for turning stainless steel · Drastically reduces the occurrence of abnormal damage in stainless steel machining and achieves long and stable tool life thanks to the new coating	AC630M
	AC630M	89.5	2.7	Super FF Coat	5	· General-purpose grade with a superior balance of fracture and wear resistance for stainless steel machining · Supports continuous and light cutting of steel with low cutting speeds	AC304
K Cast Iron	**AC405K**	92.0	2.4	Super FF Coat	18	· For high-speed cast iron turning · Grade emphasising wear resistance for high- to medium-speed cutting	AC410K
	AC4010K	91.1	2.5	ABSOTECH	20	· Our 1st recommended grade for turning gray cast iron · For high-speed cast iron turning · New thick coating realises stable long tool life even with ultra-high-speed machining of gray cast iron at vc= 700 m/min	AC405K
	AC4015K	91.1	2.5	ABSOTECH	16	· Our 1st recommended grade for turning ductile cast iron · New high-adhesion, high-strength coating realises high wear resistance and chipping resistance for stable long tool life over a wide range of cutting conditions	AC415K
	AC415K	91.1	2.5	Super FF Coat	18	· General-purpose grade with a superior balance of fracture and wear resistance	AC410K
	AC420K	91.1	2.5	Super FF Coat	12	· For interrupted machining of cast iron · Designed as a grade with emphasis on fracture resistance and chipping resistance, outstanding stability is realised in heavy interrupted cutting and unstable cutting of cast iron	AC700G

For Milling (CVD)

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grades
P Steel	**ACP100**	89.3	3.1	Super FF Coat	6	· For high-speed machining of steel · Grade emphasising wear resistance for high-speed cutting	AC230
	ACP2000	89.5	3.2	ABSOTECH	10	· For high-speed machining of steel · Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal crack resistance	ACP100
	XCU2500	89.5	3.2	ABSOTECH X	6	· General-purpose grade for a wide variety of materials such as steel, cast iron and stainless steel · New coating combining wear and fracture resistance realises long tool life in medium-speed to high-speed machining	—
M Stainless Steel	**ACM200**	89.8	3.4	Super FF Coat	6	· For machining high-hardness stainless steel · Adopts newly developed high-strength carbide substrate with excellent wear resistance and thermal resistance, realizing outstanding stability when machining hardened stainless steel	AC230
K Cast Iron	**ACK100**	92.0	2.4	Super FF Coat	6	· For high-speed cast iron milling · Adopts a high-hardness substrate with high wear resistance	—
	ACK200	91.7	2.5	Super FF Coat	6	· For high-speed cast iron milling · Adopts a tough carbide substrate with excellent wear resistance and thermal crack resistance	AC211
	ACK2000	91.7	3.1	ABSOTECH	10	· For high-speed cast iron milling · Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal resistance	ACK100 ACK200
	XCK2000	91.7	2.5	ABSOTECH X	6	· For high-speed cast iron milling · Along with a high-hardness carbide substrate, the new coating combining wear and fracture resistance realises superb long tool life in medium-speed to high-speed machining	—
S Exotic Alloy	New **XCS2000**	89.8	3.4	ABSOTECH X	4	· For high-speed machining of exotic alloys · New coating combining wear and fracture resistance realises overwhelming long tool life in medium-speed to high-speed machining	—

Coated Carbide

Characteristic Values

For Turning (PVD)

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grades
P Steel	**T1500Z** (Cermet)	92.0	2.2	Brilliant Coat*	3	· For finishing of steel · Adopts Brilliant Coat for excellent lubricity and higher machined surface quality	T2000Z
	T2500Z (Cermet)	91.8	2.4	Brilliant Coat*	3	· For finishing of steel · The use of Brilliant Coat with excellent lubricity and a tough cermet substrate realises excellent machined surface quality and superb stability	T3000Z
	AC530U	91.4	3.3	Super ZX Coat	3	· For interrupted machining of steel and stainless steel · Adopts a micro-grained tough carbide substrate and super multi-layered coating to realise outstanding fracture resistance	ACZ310
M Stainless Steel	**AC6040M**	91.6	3.8	ABSOTECH	3	· Our 1st recommended grade for interrupted machining of stainless steel · New coating with excellent adhesion resistance and peel-off resistance, together with the tough carbide substrate, realise stable tool life in heavy interrupted machining	AC530U
S Exotic Alloy	**AC5005S**	93.1	2.8	ABSOTECH	5	· Grade for high-speed and high-efficiency machining of exotic alloys · The use of a dedicated carbide substrate with great high-temperature strength realises excellent wear resistance in high-speed, high-efficiency machining	—
	AC510U	92.6	2.6	Super ZX Coat	3	· For continuous to partially interrupted machining of exotic alloys · Grade with an emphasis on wear resistance and thermal resistance for continuous machining of exotic alloys · Can also be used for interrupted machining of cast iron	EH510Z EH10Z
	AC5015S	92.7	3.2	ABSOTECH	5	· Our 1st recommended grade for turning exotic alloys · Adopts a carbide substrate with excellent thermal resistance and a new coating with excellent wear resistance and chipping resistance, realizing stable long tool life over a wide range of cutting conditions	AC510U
	AC520U	91.7	3.0	Super ZX Coat	3	· For interrupted machining of exotic alloys · Grade with an emphasis on fracture resistance for interrupted machining of exotic alloys · Also suitable for interrupted machining of stainless steel	EH520Z EH20Z
	AC5025S	91.8	3.6	ABSOTECH	5	· For partially interrupted to interrupted machining of exotic alloys · Adopts a carbide substrate with excellent fracture resistance and a new coating with excellent wear resistance and chipping resistance, realizing stable long tool life under unstable cutting conditions	AC520U
H Hardened Steel	**AC503U**	93.2	1.7	Super ZX Coat	3	· For roughing of hardened steel · Adopts a high-hardness carbide substrate and super multi-layered coating to realise outstanding wear resistance	—
For Small Lathes	**AC1030U**	91.6	3.8	ABSOTECH	2	· Our 1st recommended grade for high-precision machining · Adopts a new coating with excellent adhesion resistance and peel-off resistance which realises outstanding stability and machined surface quality due to the improved cutting edge quality	—
	ACZ150	91.4	3.3	ZX Coat	1	· For high-precision machining · Adopts an ultra-thin coating and micro-grain tough carbide substrate to realise excellent machined surface quality	—

For Milling (PVD)

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grades
P Steel	**ACU2500**	91.6	3.8	ABSOTECH	3	· General-purpose grade covering steel, stainless steel, and cast iron machining · Adopts a carbide substrate with excellent fracture resistance and wear resistance, plus a new coating with excellent wear resistance and chipping resistance, realising stable long tool life on various work materials	—
	ACP200	89.5	3.2	(New) Super ZX Coat	3	· Our 1st recommended grade for steel applications · General-purpose grade with an excellent balance of wear and fracture resistance · Also suitable for machining stainless steel	ACZ330
	ACP300	89.3	3.1	(New) Super ZX Coat	3	· For interrupted machining of steel · Tough grade with an emphasis on fracture resistance · Also suitable for interrupted machining of stainless steel	ACZ350
	ACP3000	89.5	3.2	ABSOTECH	3	· Our 1st recommended grade for milling steel · Carbide substrate with excellent thermal crack resistance, plus a new coating with excellent wear resistance and chipping resistance, realises stable long tool life over a wide range of cutting conditions	ACP200 ACP300
M Stainless Steel	**ACM100**	91.4	3.3	(New) Super ZX Coat	3	· For high-speed machining of stainless steel · Adopts high-hardness micro-grained carbide substrate and super multi-layered coating to realise outstanding wear resistance	ACZ310
	ACM300	89.8	3.4	(New) Super ZX Coat	3	· Our 1st recommended grade for milling stainless steel · Adopts high-strength carbide substrate and super multi-layered coating for next-level wear resistance and fracture resistance	—
K Cast Iron	**ACK300**	91.4	3.3	(New) Super ZX Coat	3	· General-purpose grade with an excellent balance of wear and fracture resistance	ACZ310
	ACK3000	91.7	3.1	ABSOTECH	3	· Our 1st recommended grade for milling cast iron · Adopts a high thermal conductivity carbide substrate and a new coating with excellent wear resistance and chipping resistance, realizing stable long tool life over a wide range of cast iron machining operations	ACK300
N Non-Ferrous Metal	**DL1000**	92.9	2.1	AURORA Coat (DLC)	0.5	· Grade for milling non-ferrous metal, utilising DLC coat with a low coefficient of friction and excellent adhesion resistance	—
	DL2000	91.6	3.8	AURORA Coat (DLC)	0.5	· Grade for milling non-ferrous metal, utilising DLC coat with a low coefficient of friction and excellent adhesion resistance	—
S Exotic Alloy	New **ACS2500**	90.8	4.2	ABSOTECH	3	· First recommendation for titanium alloy applications · Carbide substrate with excellent wear and adhesion resistance, coupled with a chipping-resistant coating, balances excellent wear and fracture resistance	ACZ310
	New **ACS3000**	89.8	3.4	ABSOTECH	3	· Suitable for a wide range of exotic alloy machining applications · Realises superb stability due to a high-toughness carbide substrate with a highly chipping-resistant coating	—

*Brilliant Coat may appear a slightly different colour or lustre due to light interference, but these variations do not affect the performance.

Cermet

Various grades and expanded range of catalogue items meet a wide range of finishing needs.

Grade with Better Wear Resistance T1000A, General-purpose Grade T1500A, General-purpose Coated Grade T1500Z, Grade with Better Toughness T2500Z in the Lineup. Expanded lineup of catalogue items for a wide variety of finishing applications.

Features

Uncoated

T1000A

High-hardness grade with superior wear resistance

- Improved wear and fracture resistance.
- Solid solution hard phase reduces reaction with steel.
- Perfect for high-speed continuous finishing of steel, cast iron, and sintered alloys.

Coated

T1500Z

General-purpose coated grade that employs our proprietary Brilliant Coat* PVD coating with excellent lubricity

- Excellent wear resistance provides long tool life.
- Reduces adhesion of work material for beautiful finished machined surfaces.

Uncoated

T1500A

A general-purpose grade that provides both wear and fracture resistance with higher-quality surface finishes

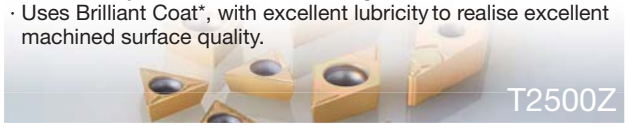
- Mixing hard phases of different functionality, grain size and composition improves balance of wear and fracture resistance.
- Improved cutting edge treatment technology provides beautiful finished machined surfaces.

Coated

T2500Z

Tough grade with excellent fracture resistance and thermal crack resistance

- Fine, uniform grain structure greatly improves toughness.
- Improves thermal crack resistance due to high thermal conductivity and realises stable, long tool life.
- Uses Brilliant Coat*, with excellent lubricity to realise excellent machined surface quality.



Characteristic Values

For Turning

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grades
P Steel / K Cast Iron	**T1000A**	93.3	1.8	—	—	· For continuous machining of steel · High-hardness grade with superior wear resistance · Supports finishing of cast iron and sintered alloys	T110A
	T1500A	92.0	2.2	—	—	· Our 1st recommended cermet grade for turning steel · General-purpose grade with an excellent balance of wear and fracture resistance, achieving an excellent machined surface over a wide range of cutting conditions	T1200A
	T2500A	91.8	2.4	—	—	· For interrupted machining of steel · Fine, uniform grain structure greatly improves toughness, realising long tool life and excellent surface finishes even with interrupted cutting	—
	T1500Z	92.0	2.2	Brilliant Coat*	3	· Adopts Brilliant Coat for excellent lubricity and higher machined surface quality	T2000Z
	T2500Z	91.8	2.4	Brilliant Coat*	3	· For finishing of steel · The use of Brilliant Coat with excellent lubricity and a tough cermet substrate realises excellent machined surface quality and superb stability	T3000Z

For Milling

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grades
P Steel / M Stainless Steel	**T1500A**	92.0	2.2	—	—	· For finishing of steel and stainless steel · Excellent balance of wear and fracture resistance, achieving excellent machined surface quality over a wide range of cutting conditions	T1200A
	T250A	91.4	2.1	—	—	· For finishing of steel and stainless steel · Tough grade with enhanced crack development resistance	—
	T2500A	91.8	2.4	—	—	· For finishing of steel and stainless steel · Fine, uniform grain structure greatly improves toughness, realising long tool life and excellent surface finishes	T250A
	T4500A	91.0	2.3	—	—	· For finishing of steel and stainless steel · Tough grade with excellent fracture resistance and reduced thermal cracking	—

*Brilliant Coat may appear a slightly different colour or lustre due to light interference, but these variations do not affect the performance.

Cemented Carbide

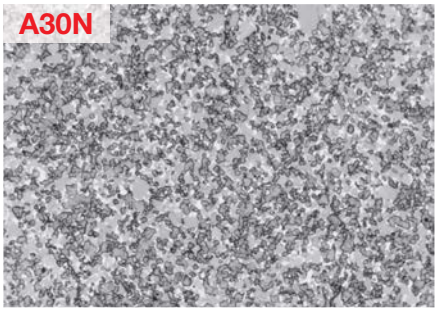
IGETALLOY cemented carbides have a solid history and a wide variety of grades to suit many different applications. They are widely used and appreciated for their superior performance.

The IGETALLOY range consists of cemented carbide grades with various characteristics that correspond to the cutting tool application. This is achieved by varying the carbide components: the WC structure (main component) and additives such as TiC, TaC, and Co (binder).

The wide selection of IGETALLOY grades provides excellent wear resistance and toughness in various cutting conditions.

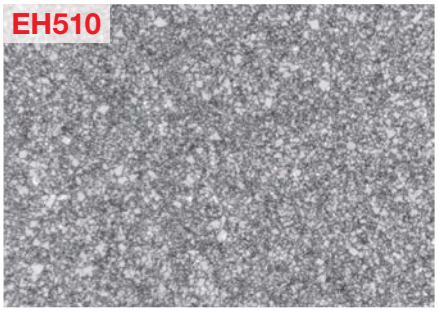
● For Steel

A30N



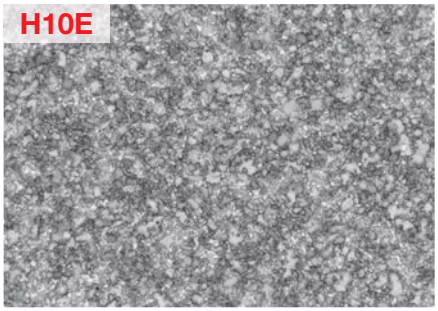
● For Stainless Steel

EH510



● For Cast Iron

H10E



Characteristic Values

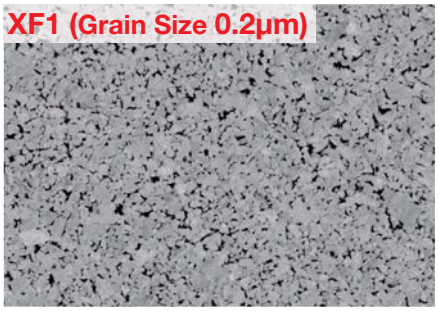
Work Material	Grade	Hardness (HRA)	TRS (GPa)	Thermal Conductivity (W/m/°C)	Young's Modulus (GPa)
P Steel	ST10P	92.1	1.9	25	470
	ST20E	91.8	1.9	42	550
	A30	91.3	2.1	35	520
	A30N	91.2	2.2	35	520
	ST40E	90.4	2.6	75	—
M Stainless Steel	EH510	92.6	2.6	76	630
	EH520	91.7	3.0	78	600
	A30	91.3	2.1	35	520
	A30N	91.0	2.4	35	500
K Cast Iron	BL130	94.3	2.9	56	660
	H2	93.2	1.8	105	600
	H1	92.9	2.1	109	650
	EH510	92.6	2.6	76	630
	H10E	92.3	2.0	67	560
	EH520	91.7	3.0	78	600
	G10E	91.1	2.2	105	620
N Non-Ferrous Metal	H1	92.9	2.1	109	650
	H20	91.6	3.8	—	590
S Exotic Alloy	EH510	92.6	2.6	76	630
	EH520	91.7	3.0	78	600

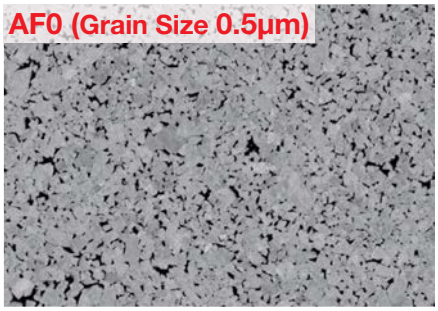
Cemented Carbide

The IGETALLOY micro-fine grained carbide series performs at a world-class level to deliver superior performance in small drills and other tools.

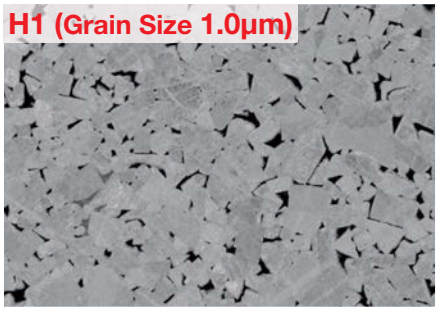
IGETALLOY micro-fine grained cemented carbides feature a WC structure between 0.2 and 1μm and are extremely strong and hard. They also provide excellent sharpness and superb surface quality on machined surfaces.
These features provide excellent performance in a variety of applications from ø0.1mm PCB drills and endmill materials to thin-bladed slitters and precision molds.

● Ultra-fine Grained Carbide





● Micro-grained Carbide



Characteristic Values

Classification	Grade	Properties					Features	Applications
		Grain Size (μm)	Co Content (wt%)	TRS (GPa)	Hardness (HRA)	Hardness HV (GPa)		
Ultra-fine Grained Carbide	**XF1**	0.2	9.0	4.0	93.5	19.2	World's smallest grain size ultra-fine grained carbide	Microdrills, Very Small Diameter Drills
	AF1	0.5	12.0	4.4	92.5	17.3	World's toughest ultra-fine grained carbide	Microdrills, Mini-tools, Punches
	AF0	0.5	10.0	4.1	93.0	18.0	Tough, wear-resistant ultra-fine grained carbide	Microdrills, Routers
	AFU	0.5	8.0	3.8	93.6	19.4	Wear-resistant ultra-fine grained carbide	PCB Drills, Endmills for High-Hardness Materials
Micro-fine Grained Carbide	**A1**	0.7	13.0	3.2	91.4	15.6	Tough micro-fine grained carbide	Endmills, Taps, Drills for Cast Iron, Punches
	KH12	0.7	10.0	4.0	92.4	17.2	Micro-fine grained carbide with excellent wear resistance and toughness	Endmills, Drills for Steel
	F0	0.7	5.0	2.0	93.6	20.1	Micro-fine grained carbide with superior wear resistance	PCB Drills, Routers
Micro-grained Carbide	**KH03**	1.0	10.0	3.3	91.4	15.2	Micro-grained carbide with excellent strength and toughness	Molds/Dies, Drills, Endmills
	KH05	1.0	13.0	3.5	90.4	13.6	Tough, micro-grained carbide	Molds/Dies
	H1	1.0	5.0	2.1	92.9	17.7	Micro-grained carbide with superior wear resistance	Drills for Cast Iron and High-Hardness, Reamers
	ZF16	1.0	6.0	3.5	93.0	18.6	Wear- and chipping-resistant micro-grained carbide for high-speed machining	PCB Drills

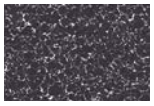
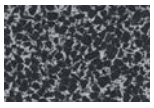
Carbide Materials ••• ☞K2

CBN

High hardness and thermal resistance for cutting hardened steel and hard cast iron.
High-speed finishing of gray cast iron with long tool life is also possible.

"SUMIBORON" was first successfully developed in Japan by our company in 1977. "Coated SUMIBORON" with a special ceramic coating and "SUMIBORON BINDERLESS" made by directly bonding CBN particles without a binder are new additions to our product lineup.

Features

Structure Features	Structure	CBN Content	Hardness (GPa)	Grades	Work Materials/Applications	Features
Pure CBN particles, firmly bonded		High	54	NCB100	Cast Iron, Titanium Alloy, Pure Titanium, Cobalt-chrome Alloy, Cemented Carbide, Cermet	· Containing no binder, its structure of directly bonded nano- to sub-micron CBN particles provides high hardness and thermal conductivity, making it highly efficient with a longer tool life when machining exotic alloys such as titanium alloys and cobalt-chrome alloys
Mainly CBN grains fused together				BN7125 New BN7115 BNC8115 BNS8125	Cemented Carbide, Chilled Cast Iron, Ni-Hard Cast Iron, Sintered Ferrous Alloy, Heat-Resistant Alloy	· High CBN content. Structure consists of strongly fused CBN grains · Suited to cutting cast iron, heat-resistant alloy, cemented carbide and other high-hardness materials
Mainly CBN grains held together with a binder		Low	27	BN1000/BN2000/BN350 BNX10/BNX20/BN500 BNC2115/BNC2125/BNC2105 New BNC2010/BNC2020/BNC300 BNC100/BNC160/BNC200/BNC500	Alloy Steel, Case Hardened Steel, Carbon Tool Steel, Bearing Steel, Die Steel, Ductile Cast Iron	· CBN grains are fused together strongly with a special ceramic binder · Strong CBN binding provides superior wear resistance and toughness when cutting hardened steel and cast iron

Grade Range Map

Work Material	Series	High-speed Cutting	Finishing to Light Cutting	Medium Cutting		Rough to Heavy Cutting
H Hardened Steel	Classification	—	H01	H10	H20	H30
	Coated SUMIBORON		New BNC2105 BNC2115 BNC2010 BNC100	BNC2125 BNC2020 BNC160 BNC200		BNC300
	Uncoated SUMIBORON		BN1000 BNX10	BN2000	BNX20	BN350
Sintered Alloy	Classification	—	01	10	20	30
	Uncoated SUMIBORON		BN7115	New BN7125		
K Cast Iron	Classification	—	K01	K10	K20	K30
	Coated SUMIBORON		BNC500*		BNC8115	
	Uncoated SUMIBORON		NCB100 BN500 New BN7125		BNS8125	
S Exotic Alloy	Classification	—	S01	S10	S20	S30
	Uncoated SUMIBORON		NCB100 New BN7125	BNS8125		

*Dedicated for Ductile Cast Iron

CBN

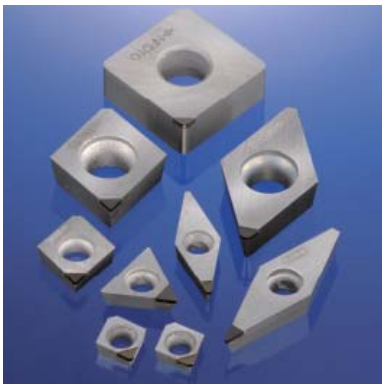
Characteristic Values

Work Material	Grade	Binder	CBN Content (%)	Grain Size (μm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (μm)	Features
H Hardened Steel	New BNC2105	TiCN	45 to 50	3	30 to 32	1.1 to 1.2	TiAlN Super Multi-layered Coating	3	Grade with excellent wear resistant coating and a CBN substrate ideal for high-speed finishing applications.
	BNC2115	TiN	60 to 65	3	31 to 33	1.3 to 1.4	TiAlSiN Super Multi-layered Coating	3	Utilizing a coating with exceptional notch wear resistance and a tough CBN substrate to achieve stable and excellent surface finish.
	BNC2125	TiN	65 to 70	4	33 to 35	1.5 to 1.6	TiAlBN Super Multi-layered Coating	3	Combination of a tough CBN substrate and a coating that has a balance of wear resistance and toughness, to achieve even more stable machining.
	BNC2010	TiCN	50 to 55	2	30 to 32	1.1 to 1.2	TiCN Multi-layered Coating	2	Improved wear resistance from coating and substrate, achieves excellent and consistent surface finish.
	BNC2020	TiN	70 to 75	5	34 to 36	1.4 to 1.5	TiAlN Multi-layered Coating	2	Utilising a tough substrate along with a highly wear-resistant and adhesive coating layer, to achieve long tool life in general-purpose to high-efficiency machining.
	BNC300	TiN	60 to 65	1	33 to 35	1.5 to 1.6	TiAlN	1	Suitable for finishing of workpieces with a mixture of continuous and interrupted cutting portions.
	BNC100	TiN	40 to 45	1	29 to 32	1.0 to 1.1	TiAlN/TiCN	3	Grade suitable for high-speed finishing thanks to highly wear-resistant coating.
	BNC160	TiN	60 to 65	3	31 to 33	1.2 to 1.3	TiAlN/TiCN	3	Achieves stable, high-precision finishing of hardened steel.
	BNC200	TiN	65 to 70	4	33 to 35	1.4 to 1.5	TiAlN	3	A tough CBN substrate and a coating with high wear resistance provide a long tool life.
	BN1000	TiCN	40 to 45	1	27 to 31	0.9 to 1.0	—	—	Grade with ultimate wear and fracture resistance, suitable for high-speed cutting.
	BN2000	TiN	50 to 55	2	31 to 34	1.1 to 1.2	—	—	General-purpose grade for hardened steel machining with a high degree of fracture and wear resistance.
	BNX20	TiN	55 to 60	3	31 to 33	1.0 to 1.1	—	—	Grade with excellent crater wear resistance, suitable for high-efficiency cutting under high-temperature conditions.
	BN350	TiN	60 to 65	1	33 to 35	1.5 to 1.6	—	—	Grade with the highest cutting edge strength, suitable for heavy interrupted cutting.
	BNX10	TiCN	40 to 45	3	27 to 31	0.9 to 1.0	—	—	Highly wear-resistant grade, suitable for high-speed continuous machining.
K Cast Iron / Sintered Alloy	BN7115	Co Compound	90 to 95	1	41 to 44	2.2 to 2.3	—	—	Grade suitable for finishing of sintered alloys that combines the highest cutting edge sharpness with fracture resistance.
	New BN7125	Co Compound	90 to 95	2	41 to 44	1.9 to 2.0	—	—	General-purpose grade with excellent wear resistance, fracture resistance, and thermal shock resistance, suitable for machining of cast iron and exotic alloys
	BNS8125	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	—	—	Grade with 100% solid CBN structure that exhibits excellent wear and fracture resistance
	BNC8115	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	TiAlN	2	Grade with 100% solid CBN structure, using PVD coating with excellent wear resistance to enable roughing operations.
	BNC500 (For Ductile Cast Iron)	TiC	60 to 65	4	32 to 34	1.1 to 1.2	TiAlN	3	Grade suitable for machining of hard-to-cut cast iron, thanks to the highly wear-resistant substrate and coating.
	BN500	TiC	65 to 70	6	32 to 34	1.0 to 1.1	—	—	Grade optimised for cast iron cutting. Provides superior wear and fracture resistance.
	BN7000	Co Compound	90 to 95	2	41 to 44	1.8 to 1.9	—	—	Grade exhibiting improved wear and fracture resistance in roughing of sintered materials.
	BN7500	Co Compound	90 to 95	1	41 to 44	2.0 to 2.1	—	—	Grade maintaining good cutting edge sharpness, suitable for finishing of sintered alloys
S Exotic Alloy	NCB100	—	100	to0.5	51 to 54	1.8 to 1.9	—	—	Achieves high efficiency, improved machining accuracy, and longer tool life in machining of exotic alloys such as titanium alloy and cobalt-chrome alloys

TRS measured with test piece equivalent to the insert's CBN layer

CBN SUMIBORON Coated SUMIBORON series ••• L2~

Polycrystalline Diamond



Excellent wear resistance, longer tool life and high-speed, high-efficiency, high-precision cutting of non-ferrous metals and non-metals.

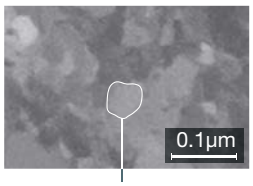
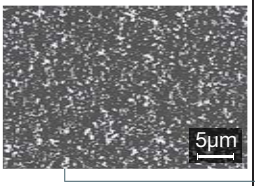
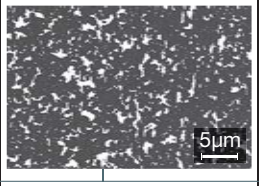
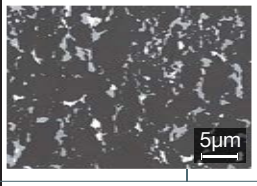
SUMIDIA is a polycrystalline diamond material made from sintered diamond powder that was first created using our proprietary technology in 1978.
SUMIDIA's superior wear resistance achieves longer tool life in high speed, high-efficiency and high precision machining of non-metal and non-ferrous metal applications including aluminum, copper, magnesium and zinc alloys.

SUMIDIA BINDERLESS uses nano-polycrystalline diamond for the cutting edge, demonstrating excellent wear resistance and fracture resistance.
In particular, it achieves extended tool life and machining accuracy superior to conventional polycrystalline diamond when machining hard brittle materials such as cemented carbide.

Features

● High density sintered material made of diamond particles of various particle sizes ranging from sub-microns to tens of microns.

Structure

SUMIDIA BINDERLESS	SUMIDIA			
NPD10	**DA1000**	**DA2200**	**DA150**	**DA90**
				
Diamond particles		*Black areas in image are diamond particles		

Grade Range Map

Work Material	Series	Finishing to Light Cutting		Medium Cutting	Rough to Heavy Cutting
Hard Brittle Material	Classification	01	10	20	30
	SUMIDIA BINDERLESS	NPD10			
	SUMIDIA		DA90		
N Non-Ferrous Metal	Classification	N01	N10	N20	N30
	SUMIDIA	DA1000			
			DA2200		
			DA150		
		DA90			

Polycrystalline Diamond

Characteristic Values

Work Material	Grade	Binder	CBN Content (%)	Grain Size (μm)	Hardness HK (GPa)	TRS (GPa)	Features
Hard Brittle Material	**NPD10**	—	100	up to 0.05	120 to 130	≈ 3.15	100% diamond structure that directly binds nano-order diamond particles with high strength. Demonstrates optimum wear and fracture resistance as well as the best edge sharpness.
N Non-Ferrous Metal	**DA1000**	Co	90 to 95	up to 0.5	50 to 60	≈ 2.60	High-density sintered material made of ultra-fine grain diamond that exhibits optimum wear and fracture resistance as well as excellent edge sharpness.
	DA2200	Co	85 to 90	0.5	45 to 55	≈ 2.45	Sintered material made of ultra-fine grain diamond that demonstrates both wear and fracture resistance and excellent edge sharpness.
	DA150	Co	85 to 90	5	50 to 60	≈ 1.95	Micro-grained sintered diamond particles with both machinability and wear resistance.
	DA90	Co	90 to 95	50	50 to 65	≈ 1.10	Coarse sintered diamond particles, with high diamond content for excellent wear resistance.

TRS measured with test piece equivalent to insert PCD layer

PCD **SUMIDIA series** ••• ☞M2

PCD **SUMIDIA BINDERLESS** ••• ☞M4

Ceramic

Superb wear resistance enables ultra-high-speed machining.

Sumitomo Electric Hardmetal's Advanced Ceramic utilises a special process to produce extremely tough grades.
This new development permits ultra-high-speed cutting of cast iron, heat-resistant alloy, and ultra-hard rolled material with stability.

Grade Range Map

For Turning

For Turning	High-speed Cutting	Finishing to Light Cutting		Medium Cutting	Rough to Heavy Cutting	
	—	01	10	20	30	40
K Cast Iron	NB90S					
S Exotic Alloy			WX120★			
H Hardened Steel		NB100C				

Characteristic Values

For Turning

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Main Coating Components	Coating Thickness (μm)	Features
K Cast Iron	**NB90S**	94.8	0.9	—	—	Al_2O_3+ carbon-based ceramics Suitable for medium cutting to finishing of cast iron
S Exotic Alloy	**WX120★**	90.0	1.2	—	—	Reinforced with SiC whiskers For heat-resistant alloy and ultra-hard roll cutting
H Hardened Steel	**NB100C**	95.0	1.0	TiAlN type	2	Al_2O_3-based high strength ceramic with ZX Coat Low-speed/continuous light cutting of hardened steel

★WX120 is only sold in Japan.

Material Properties

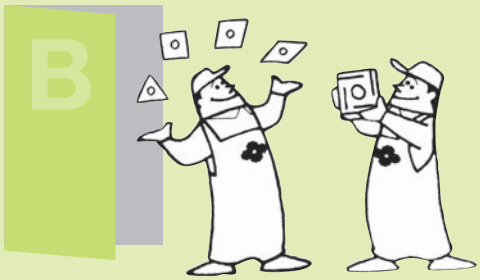
■ Material Properties

Material		Specific Gravity	Hardness (mHv) (GPa)	Young's Modulus (GPa)	Thermal Conductivity (W/m/°C)	Coefficient of Linear Expansion (X 10^{-6}/°C)	Melting Point (°C)
Tungsten Carbide	**WC**	15.6	21	690	126	5.1	2,900
Titanium Carbide	**TiC**	4.94	31	450	17	7.6	3,200
Tantalum Carbide	**TaC**	14.5	18	280	21	6.6	3,800
Niobium Carbide	**NbC**	8.2	20	340	17	6.8	3,500
Titanium Nitrate	**TiN**	5.43	20	260	29	9.2	2,950
Aluminum Oxide	**Al_2O_3**	3.98	29	410	29	8.5	2,050
Silicon Nitride	**Si_3N_4**	3.17	25	310	29	3.0	>1,900 (decomposes)
Cubic Boron Nitride	**cBN**	3.48	44	700	1,300	4.7	—
Diamond	**C**	3.52	> 90	970	2,100	3.1	—
Cobalt	**Co**	8.9	—	100 to 180	69	12.3	1,495
Nickel	**Ni**	8.9	—	200	92	13.3	1,455
Cemented Carbide	**WC-5% Co**	15.0	18	630	79	5.0	—
	WC-10% Co	14.6	14	580	75	5.0	—
	WC-20% Co	13.5	10	530	67	6.0	—
High Speed Steel		8.7	8	210	17	11.0	—

Indexable Inserts for Turning

Negative / Positive / Ceramic B1 to B132

B



Indexable Insert Identification Code ····B2
Chipbreaker Selection ····B4

New Fine Cutting Chipbreaker for G-class Positive Inserts FF type ···B10
General-purpose Chipbreaker for M-class Positive Inserts: GU type ··· B11
M-class Positive Insert Chipbreakers for Low Carbon and General Steel Turning: FB type / LB type ···B12
M-class Negative Insert Chipbreakers for Low Carbon and General Steel Turning: FB type / FE type ····B13

Negative Inserts
C / 80° Diamond type (With Hole) ····B14
D / 55° Diamond type (With Hole) ····B25
S / Square type (With Hole) ····B33
S / Square type (Without Hole) ····B46
T / Triangular type (With Hole) ····B48
T / Triangular type (Without Hole) ····B58
V / 35° Diamond type (With Hole) ····B60
W / Trigon type (With Hole) ····B63

Positive Inserts
C / 80° Diamond type (With Hole) ····B68
D / 55° Diamond type (With Hole) ····B80
R / Round type (With Hole) ····B88
S / Square type (With Hole) ····B90
S / Square type (Without Hole) ····B96
T / Triangular type (With Hole) ····B100
T / Triangular type (Without Hole) ····B101
V / 35° Diamond type (With Hole) ····B118
W / Trigon type (With Hole) ····B126

Ceramic Negative Insert (With Hole/Without Hole) ··· B128
Ceramic Positive Insert (Without Hole) ····· B129
Solid SUMIBORON ····· B130

Precautions when Using Wiper Inserts ····B131

Format of This Chapter

(1) Turning insert listing order is negative type inserts followed by positive type inserts.
(2) The order of listing in each type group is as follows: C (80° Diamond type) ➞ D (55° Diamond type) ➞ R (Round type) ➞ S (Square type) ➞ T (Triangular type) ➞ V (35° Diamond type) ➞ W (Trigon type).
(3) Listings of inserts with the same relief angle starts with those with holes and then those without holes.
(4) Inserts are grouped by shape and then further divided by size (small to large according to cutting edge length and thickness).

●Structure Diagram

	(Shape ➞ relief angle)	(Hole Y/N)	(Order of appearance)
Negative	C (80° Diamond type)	With hole	By size (small ➞ large)
		Without hole	By size (small ➞ large)
Positive	D (55° Diamond type)	With hole	By size (small ➞ large)
		Without hole	By size (small ➞ large)

Symbols in Insert Diagrams

*Symbols conform to ISO13399.

L: Cutting edge length, IC: Inscribed circle, S: Thickness, RE: Corner radius, D1: Hole diameter (For SUMIBORON and SUMIDIA, L indicates side length.)

Handed Inserts

*Typically, photos show right-handed inserts.

Insert Grades

(1) For IGETALLOY, the grades listed include Coated Carbide (CVD/PVD), Cermet, Cemented Carbide, and Ceramic.
(2) SUMIBORON and SUMIDIA are described only in SUMIBORON section (➞ L34 onward), and SUMIDIA section (➞ M10 onward).

Stock Markings and Symbols

●● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

Indexable Insert Identification Code

Example

C (1) N (2) M (3) G (4)

- (1) Insert Shape — Refer to Table 1
- (2) Relief Angle — Refer to Table 2
- (3) Tolerance — Refer to Table 3
- (4) Insert Hole — Refer to Table 4

Table 1: (1) Insert Shape

Symbol	Insert Shape		Apex Angle
C		Diamond type	80°
D			55°
E			75°
F			50°
V			35°
R		Round type	-
S		Square type	90°
T		Triangular type	60°
W		Trigon type	80°
A		Parallelogram type	85°
B			82°
K			55°
H		Hexagonal type	120°
O		Octagonal type	135°
P		Pentagonal type	108°
L		Rectangular type	90°
M		Diamond type	86°

Table 2: (2) Relief Angle

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P*	11°
O	Others

★ mark indicates inserts that are sometimes used with a 10° relief angle.

Table 3: (3) Tolerance (mm)

Symbol	Corner Height	Inscribed Circle	Thickness
A	± 0.005	± 0.025	± 0.025
F	± 0.005	± 0.013	± 0.025
C	± 0.013	± 0.025	± 0.025
H	± 0.013	± 0.013	± 0.025
E	± 0.025	± 0.025	± 0.025
G	± 0.025	± 0.025	± 0.13
J*	± 0.005	± 0.05 to ± 0.15	± 0.025
K*	± 0.013	± 0.05 to ± 0.15	± 0.025
L*	± 0.025	± 0.05 to ± 0.15	± 0.025
M*	± 0.08 to ± 0.2	± 0.05 to ± 0.15	± 0.13
N*	± 0.08 to ± 0.2	± 0.05 to ± 0.15	± 0.025
U*	± 0.13 to ± 0.38	± 0.08 to ± 0.25	± 0.13

★ mark indicates inserts that generally have sintered side surfaces. Refer to the table below (reference) for details on M class precision.

Table 4: (4) Insert Hole

Symbol	Insert Hole	Hole Style	Chipbreaker	Shape (Cross Section)	Symbol	Insert Hole	Hole Style	Chipbreaker	Shape (Cross Section)
N	No	No	No		A	Yes	Cylindrical	No	
R			One Face		M			One Face	
F			Double-sided		G			Double-sided	
W	Yes	Straight hole + Single chamfer (40° to 60°)	No		B	Yes	Straight hole + Single chamfer (70° to 90°)	No	
T			One Face		H			One Face	
Q	Yes	Straight hole + Double chamfer (40° to 60°)	No		C	Yes	Straight hole + Double chamfer (70° to 90°)	No	
U			Double-sided		J			Double-sided	
					X	-	-	-	Special

(Reference) Breakdown of M-Class Tolerance by Shape and Size

● Corner Height Tolerance (mm)

Inscribed Circle	Triangular type	Square type	80° Diamond type	55° Diamond type	35° Diamond type	Round type
6.35	± 0.08	± 0.08	± 0.08	± 0.11	± 0.16	-
9.525	± 0.08	± 0.08	± 0.08	± 0.11	± 0.16	-
12.70	± 0.13	± 0.13	± 0.13	± 0.15	-	-
15.875	± 0.15	± 0.15	± 0.15	± 0.18	-	-
19.05	± 0.15	± 0.15	± 0.15	± 0.18	-	-
25.40	± 0.18	± 0.18	± 0.18	-	-	-
31.75	-	± 0.20	-	-	-	-

● Inscribed Circle Tolerance (mm)

Inscribed Circle	Triangular type	Square type	80° Diamond type	55° Diamond type	35° Diamond type	Round type
6.35	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05	-
9.525	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05	± 0.05
12.70	± 0.08	± 0.08	± 0.08	± 0.08	-	± 0.08
15.875	± 0.10	± 0.10	± 0.10	± 0.10	-	± 0.10
19.05	± 0.10	± 0.10	± 0.10	± 0.10	-	± 0.10
25.40	± 0.13	± 0.13	± 0.13	-	-	± 0.13
31.75	-	± 0.15	-	-	-	± 0.15

Indexable Insert Identification Code

12 04 08 N - GE

(5) Cutting Edge Length — Refer to Table 5
(6) Thickness — Refer to Table 6
(7) Corner Radius — Refer to Table 7
(8) Feed Direction — Refer to Table 8
(9) Chipbreaker — Refer to Table 9

Picture of insert shown as example

Table 5: (5) Cutting Edge Length (Typical Examples)

Note: Cutting edge length indicated is measured without corner radii. (mm)

Shape	Symbol	Cutting Edge Length	Inscribed Circle	Shape	Symbol	Cutting Edge Length	Inscribed Circle	Shape	Symbol	Cutting Edge Length Negative	Cutting Edge Length Positive	Inscribed Circle Negative	Inscribed Circle Positive
C 80° Diamond type	03	3.55	3.50	D 55° Diamond type	07	7.7	6.35	W Trigon type	03	3.8		5.56	
	04	4.97	4.30		09	9.7	7.94		04	4.3		6.35	
	06	6.4	6.35		11	11.6	9.525		05	5.4		7.94	
	08	8.0	7.94		15	15.5	12.70		06	6.5	3.2	9.525	3.97
	09	9.7	9.525		19	19.4	15.875		08	8.7	4.6	12.70	4.76
	12	12.9	12.70						10	10.9		15.875	
	16	16.1	15.875	V 35° Diamond type	08	8.3	4.76		11		4.3		6.35
	19	19.3	19.05		09	9.7	5.56		16		6.5		9.525
	25	25.8	25.4		11	11.1	6.35	R Round type	08	8.0		8.0	
					16	16.6	9.525		10	10.0		10.0	
					22	22.1	12.7		12	12.0		12.0	
S Square type	06	6.35	6.35	T Triangular type	06	6.9	3.97		12	12.70		12.70	
	S7	7.14	7.14		08	8.2	4.76		15	15.875		15.875	
	07	7.94	7.94		09	9.6	5.56		16	16.0		16.0	
	09	9.525	9.525		11	11.0	6.35		19	19.05		19.05	
	12	12.70	12.70		13	13.7	7.94		20	20.0		20.0	
	15	15.875	15.875		16	16.5	9.525		24	24.0		24.0	
	19	19.05	19.05		22	22.0	12.70		25	25.0		25.0	
	25	25.40	25.40		27	27.5	15.875		25	25.40		25.40	
	31	31.75	31.75		33	33.0	19.05		32	32.0		32.0	

Table 6: (6) Thickness

Symbol	Thickness (mm)
X1	*
01	1.59
02	2.38
T2	2.78
03	3.18
T3	3.97
04	4.76
05	5.56
06	6.35
07	7.94
09	9.52

(*)
CC□T03X1 Insert Thickness: 1.40
CC□T04X1 Insert Thickness: 1.80

Table 7: (7) Corner Radius

Symbol	Corner Radius (mm)
00	Sharp Edged
003	0.03
008	0.08
01	0.1
015	0.15
018	0.18
02	0.2
035	0.35
04	0.4
08	0.8
10	1.0
12	1.2
16	1.6
20	2.0
24	2.4
32	3.2
M0	Round type (Metric)
00	Round type (Inch)
00	Round Insert (Imperial)

"M" after the corner radius code indicates a negative tolerance.

Table 8: (8) Feed Direction

Symbol	Feed Direction
R	Right-Hand
L	Left-Hand
N	Neutral

Table 9: (9) Chipbreaker

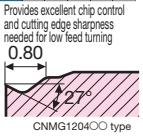
Symbol	Applications	3D type (Bumpy type)	Standard	Handed type
F□	Fine Finishing to Finishing	FA, FL, FE, FF, FB, FC, FK, FP		FT, FX, FZ FYS,FY, FW
S□ L□	Light Cutting	SE, SEW, SI, SC, SF, SS, SU, SX LU, LUW, LB		SD SDW ST
G□ U□	General Machining	GE, GU, GUW UG, UP US, UX	GZ UZ	UM
M□	Roughing	MP, MU, MX, ME	MC	MM HM
H□	Heavy Cutting	HG, HP, HF	HU HW	

Other Specials	
Wide Chipbreaker	W
Double Positive Chipbreaker	GX
For Chamfering	C
For Round type Inserts	RD, RP, RX, RH
For Exotic Alloy Turning	EF, EG, EX, EM
For Aluminum Alloy Turning	AW, AG, AX, AY, LD, GD
For Hardened Steel Turning	FV, LV, GH
For Carburised Layer Removal	SV
For Stainless Steel Turning	EF, EG, EM

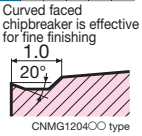
Chipbreaker Selection

Negative type Finishing to Medium Cutting

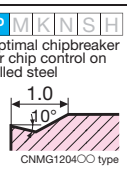
Fine Cutting

FB type — Provides excellent chip control and cutting edge sharpness needed for low feed turning


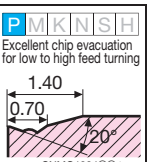
P M K N S H | 0° | C D R S T V W

FA type — Curved faced chipbreaker is effective for fine finishing


P M K N S H | 0° | C D R S T V W

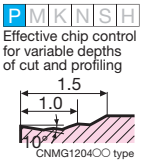
FL type — Optimal chipbreaker for chip control on rolled steel


P M K N S H | 0° | C D R S T V W

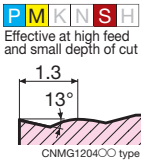
FE type — Excellent chip evacuation for low to high feed turning


P M K N S H | 0° | C D R S T V W

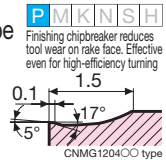
Finishing

LU type — Effective chip control for variable depths of cut and profiling


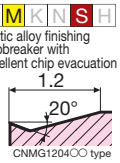
P M K N S H | 0° | C D R S T V W

SU type — Effective at high feed and small depth of cut


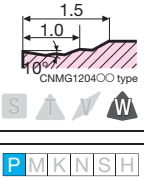
P M K N S H | 0° | C D R S T V W

SE type — Finishing chipbreaker reduces tool wear on rake face. Effective even for high-efficiency turning


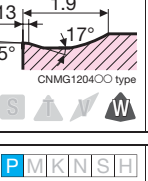
P M K N S H | 0° | C D R S T V W

EF type — Exotic alloy finishing chipbreaker with excellent chip evacuation


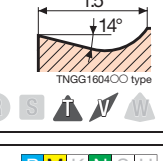
P M K N S H | 0° | C D R S T V W

LUW type — High-efficiency finishing chipbreaker with wiper edge


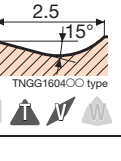
Wiper Insert | P M K N S H | 0° | C D R S T V W

SEW type — New high-feed finishing chipbreaker with wiper edge


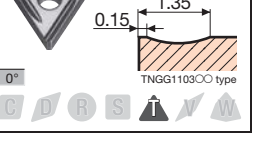
Wiper Insert | P M K N S H | 0° | C D R S T V W

FX type — Parallel chipbreaker with superior cutting edge sharpness


P M K N S H | 0° | C D R S T V W

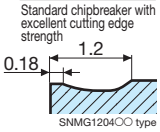
FY type — Wide chipbreaker with cutting edge sharpness


P M K N S H | 0° | C D R S T V W

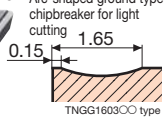
FT type — Arc-shaped ground type finishing chipbreaker


P M K N S H | 0° | C D R S T V W

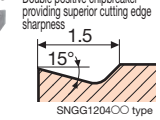
Light to Medium Cutting

SJ type — Standard chipbreaker with excellent cutting edge strength


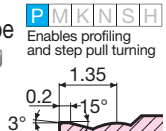
P M K N S H | 0° | C D R S T V W

ST type — Arc-shaped ground type chipbreaker for light cutting


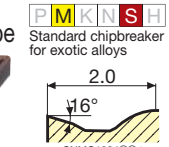
P M K N S H | 0° | C D R S T V W

GX type — Double positive chipbreaker providing superior cutting edge sharpness


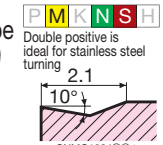
P M K N S H | 0° | C D R S T V W

SX type — Enables profiling and step pull turning


P M K N S H | 0° | C D R S T V W

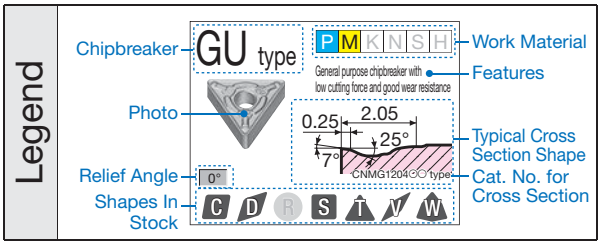
EX type — Standard chipbreaker for exotic alloys


P M K N S H | 0° | C D R S T V W

UP type — Double positive is ideal for stainless steel turning


P M K N S H | 0° | C D R S T V W

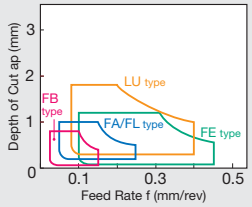
Legend

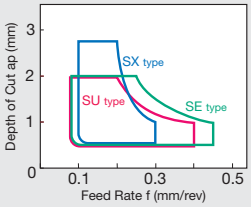


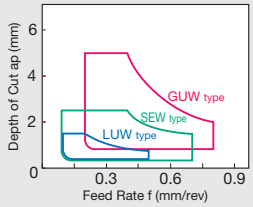
Bumpy Chipbreaker | Standard Chipbreaker | Handed Chipbreaker
BREAK MASTER (CBN/PCD) | For Chamfering

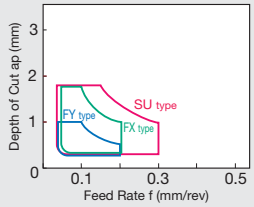
Applicable Work Materials: P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Chipbreaker Application Range (Inscribed Circle of Insert up to ø12.7mm)

Fine Finishing to Finishing


Finishing to Light Cutting


Wiper Insert


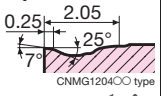
High-precision Cutting (Ground)


Indicated chipbreaker application ranges and shapes are representative values only. Actual values may change according to the actual catalogue number (size, class, etc.). For details, refer to "Stock Items" in Chapter B.

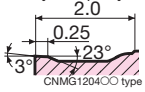
Chipbreaker Selection

Negative type Medium Cutting to Roughing

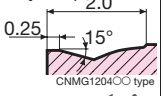
Medium Cutting

GU type — P M K N S H
General purpose chipbreaker with low cutting force and good wear resistance


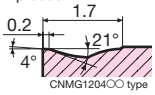
0° — C D R S T V W

GE type — P M K N S H
General purpose chipbreaker with high rake face wear resistance even in high-efficiency turning


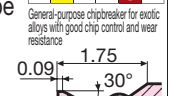
0° — C D R S T V W

UX type — P M K N S H
General purpose chipbreaker with strong cutting edge and high reliability


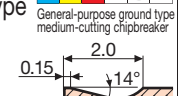
0° — C D R S T V W

UG type — P M K N S H
Highly versatile, long-selling product


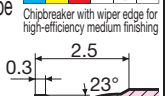
0° — C D R S T V W

EG type — P M K N S H
General-purpose chipbreaker for exotic alloys with good chip control and wear resistance


0° — C D R S T V W

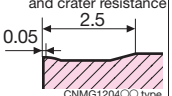
UM type — P M K N S H
General-purpose ground type medium-cutting chipbreaker


0° — C D R S T V W

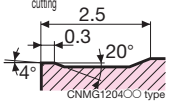
GUW type — P M K N S H
Chipbreaker with wiper edge for high-efficiency medium finishing
Wiper Insert


0° — C D R S T V W

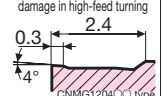
Medium to Roughing

EM type — P M K N S H
Chipbreaker with excellent fracture and crater resistance


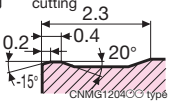
0° — C D R S T V W

MU type — P M K N S H
Economical double-sided chipbreaker with low cutting force for high-feed cutting


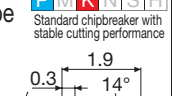
0° — C D R S T V W

ME type — P M K N S H
Roughing chipbreaker that suppresses rake face damage in high-feed turning


0° — C D R S T V W

MX type — P M K N S H
Strong cutting edge for interrupted cutting


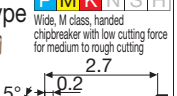
0° — C D R S T V W

UZ type — P M K N S H
Standard chipbreaker with stable cutting performance


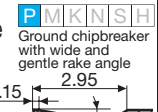
0° — C D R S T V W

GZ type — P M K N S H
Extremely reliable standard chipbreaker with cutting edge strength

0° — C D R S T V W

HM type — P M K N S H
Wide, M class, handed chipbreaker with low cutting force for medium to rough cutting


0° — C D R S T V W

MM type — P M K N S H
Ground chipbreaker with wide and gentle rake angle


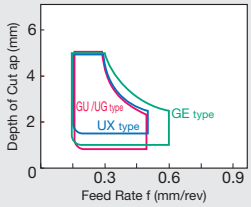
0° — C D R S T V W

Bumpy Chipbreaker | Standard Chipbreaker | Handed Chipbreaker
BREAK MASTER (CBN/PCD) | For Chamfering

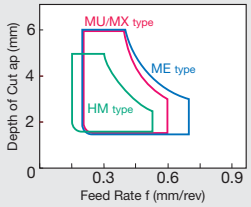
Applicable Work Materials: P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Chipbreaker Application Range (Inscribed Circle of Insert up to ø12.7mm)

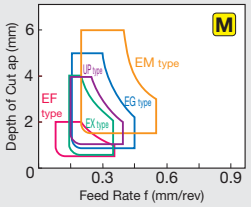
Medium Cutting



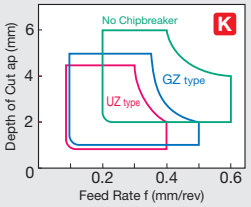
Roughing



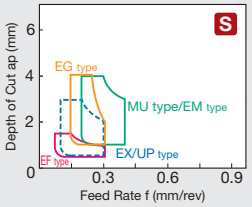
Stainless Steel



Cast Iron



Exotic Alloy



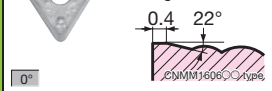
Indicated chipbreaker application ranges and shapes are representative values only. Actual values may change according to the actual catalogue number (size, class, etc.). For details, refer to "Stock Items" in Chapter B.

Chipbreaker Selection

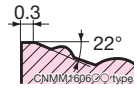
Negative type Roughing

Rough to Heavy Cutting

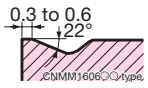
HG type — P M K N S H
Excellent chip control for heavy cutting



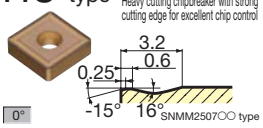
MP type — P M K N S H
Single-sided chipbreaker with low cutting force for roughing



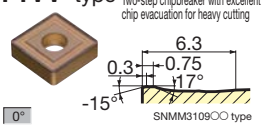
HP type — P M K N S H
Strongest cutting edge for heavy cutting



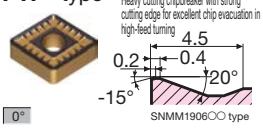
HU type — P M K N S H
Heavy cutting chipbreaker with strong cutting edge for excellent chip control



HW type — P M K N S H
Two-step chipbreaker with excellent chip evacuation for heavy cutting



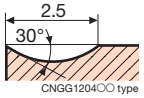
HF type — P M K N S H
Heavy cutting chipbreaker with strong cutting edge for excellent chip evacuation in high-feed turning



Negative type Aluminum Alloy Cutting

Finishing

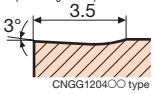
AX type — P M K N S H
Parallel Al chipbreaker with cutting edge sharpness



Negative type Hardened Steel Cutting

Finishing

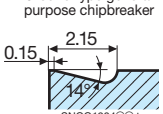
GH type — P M K N S H
Hardened steel chipbreaker reduces cutting force and provides good chip evacuation



Negative type Chamfering

Chamfering

C type — P M K N S H
Ground type general-purpose chipbreaker

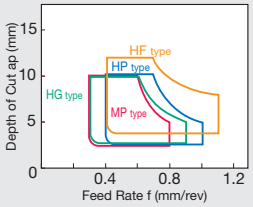


Bumpy Chipbreaker | Standard Chipbreaker | Handed Chipbreaker
BREAK MASTER (CBN/PCD) | For Chamfering

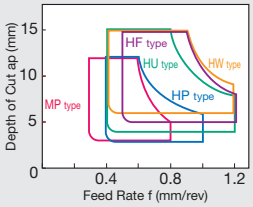
Applicable Work Materials: P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Chipbreaker Application Range

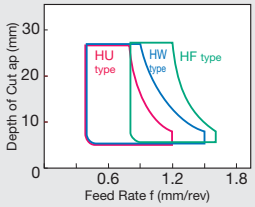
Rough to Heavy Cutting (Inscribed Circle ø15.875 to 19.05mm)



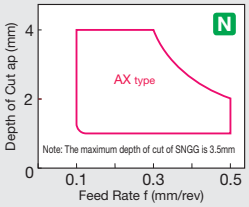
Rough to Heavy Cutting (Inscribed Circle ø25.4mm)



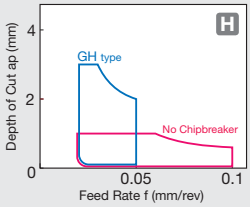
Rough to Heavy Cutting (Inscribed Circle ø31mm)



Aluminum Alloy



Hardened Steel

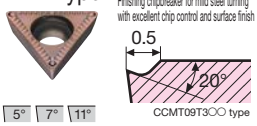


Indicated chipbreaker application ranges and shapes are representative values only. Actual values may change according to the actual catalogue number (size, class, etc.). For details, refer to "Stock Items" in Chapter B.

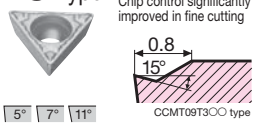
Chipbreaker Selection

Positive type M Class (Finishing to Medium Cutting)

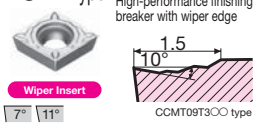
Finishing to Light Cutting

FB type — P M K N S H
Finishing chipbreaker for mild steel turning with excellent chip control and surface finish


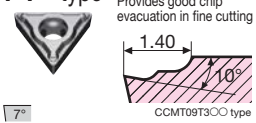
5° 7° 11° — CCMT09T3○○ type
C D R S T V W

LU type — P M K N S H
Chip control significantly improved in fine cutting


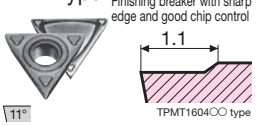
5° 7° 11° — CCMT09T3○○ type
C D R S T V W

LUW type — P M K N S H
High-performance finishing breaker with wiper edge


Wiper Insert
7° 11° — CCMT09T3○○ type
C R S T V W

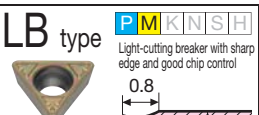
FP type — P M K N S H
Provides good chip evacuation in fine cutting


7° — CCMT09T3○○ type
C D S T W

FK type — P M K N S H
Finishing breaker with sharp edge and good chip control


11° — TPMT1604○○ type
C D R S T V W

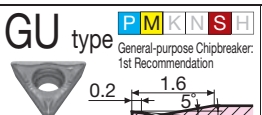
Light to Medium Cutting

LB type — P M K N S H
Light-cutting breaker with sharp edge and good chip control


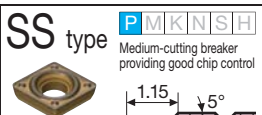
5° 7° 11° — CCMT09T3○○ type
C D R S T V W

SU type — P M K N S H
General purpose chipbreaker with excellent sharpness

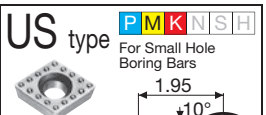
5° 7° 11° — TPMT1103○○ type
C D R S T V W

GU type — P M K N S H
General-purpose Chipbreaker: 1st Recommendation


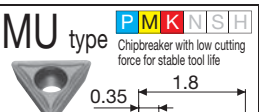
5° 7° 11° — CCMT09T3○○ type
C D R S T V W

SS type — P M K N S H
Medium-cutting breaker providing good chip control


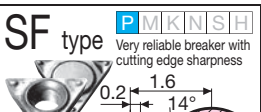
11° — CPMH0903○○ type
C D R S T W

US type — P M K N S H
For Small Hole Boring Bars


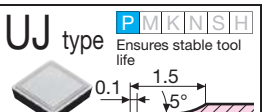
11° — CPMH0903○○ type
C D R S W

MU type — P M K N S H
Chipbreaker with low cutting force for stable tool life


7° 11° — TPMT1604○○ type
C D R S T W

SF type — P M K N S H
Very reliable breaker with cutting edge sharpness


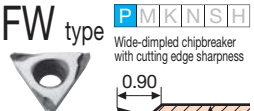
11° — TPMT1604○○ type
C D R S T V W

UJ type — P M K N S H
Ensures stable tool life


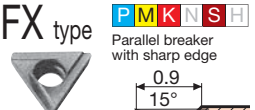
11° — TPMR1603○○ type
C D R S T W

Positive type G Class (Ground type)

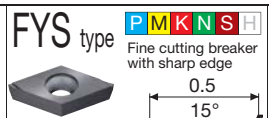
Finishing to Light Cutting

FW type — P M K N S H
Wide-dimpled chipbreaker with cutting edge sharpness


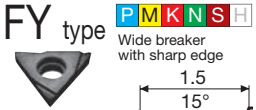
5° 11° — TPMT1102○○ type
C D R S T V W

FX type — P M K N S H
Parallel breaker with sharp edge


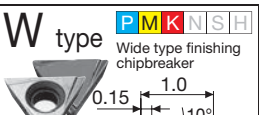
5° 7° 11° — TPGT1103○○ type
C D R S T V W

FYS type — P M K N S H
Fine cutting breaker with sharp edge


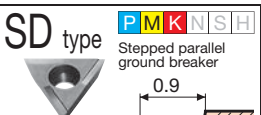
5° 7° — CCGT04X1○○ type
C D R S T V W

FY type — P M K N S H
Wide breaker with sharp edge


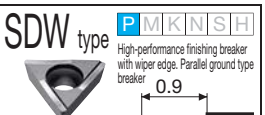
5° 7° 11° — TPGT1103○○ type
C D R S T V W

W type — P M K N S H
Wide type finishing chipbreaker


5° 11° — TPGR1103○○ type
C D R S T W

SD type — P M K N S H
Stepped parallel ground breaker


7° 11° — TPGT1103○○ type
C D R S T V W

SDW type — P M K N S H
High-performance finishing breaker with wiper edge. Parallel ground type breaker


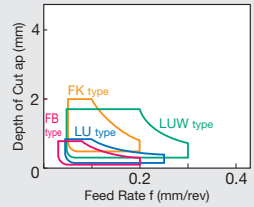
Wiper Insert
11° — TPGX1103○○ type
C D R S T W

Bumpy Chipbreaker | Standard Chipbreaker | Handed Chipbreaker
BREAK MASTER (CBN/PCD) | For Chamfering

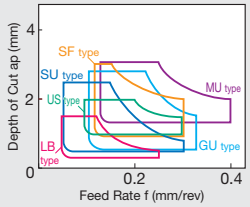
Applicable Work Materials: P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Chipbreaker Application Range

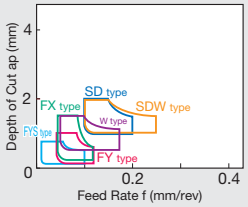
M Class Finishing to Light Cutting



M Class Light to Medium Cutting



G Class Ground type



Indicated chipbreaker application ranges and shapes are representative values only. Actual values may change according to the actual catalogue number (size, class, etc.). For details, refer to "Stock Items" in Chapter B.

Chipbreaker Selection

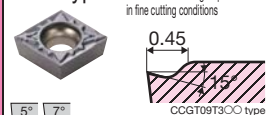
Positive type G Class

Finishing to Light Cutting

FF type (New)

P M K N S H

Realises outstanding chip evacuation in fine cutting conditions



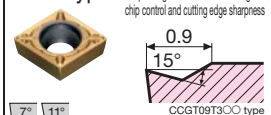
5° 7°

C D R S T V W

FC type

P M K N S H

Peripheral ground 3D breaker with good chip control and cutting edge sharpness



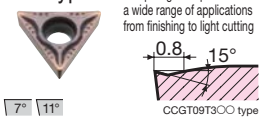
7° 11°

C D R S T V W

SI type

P M K N S H

Sharp-edged chipbreaker for a wide range of applications from finishing to light cutting



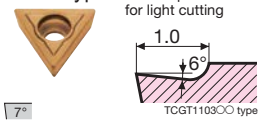
7° 11°

C D R S T V W

SC type

P M K N S H

Two-step breaker for light cutting



7°

C D R S T V W

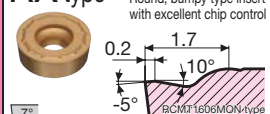
Positive type Round type Inserts

Round type

RX type

P M K N S H

Round, bumpy type insert with excellent chip control



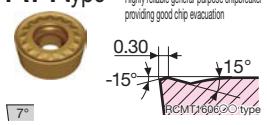
7°

C D R S T V W

RH type

P M K N S H

Highly reliable general-purpose chipbreaker providing good chip evacuation



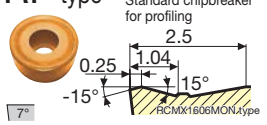
7°

C D R S T V W

RP type

P M K N S H

Standard chipbreaker for profiling



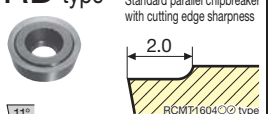
7°

C D R S T V W

RD type

P M K N S H

Standard parallel chipbreaker with cutting edge sharpness



11°

C D R S T V W

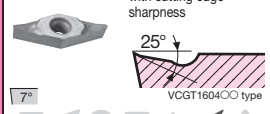
Positive type Aluminum Alloy Cutting

Finishing

AW type

P M K N S H

Finishing Al chipbreaker with cutting edge sharpness



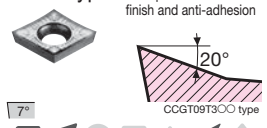
7°

C D R S T V W

AG type

P M K N S H

Al chipbreaker for mirror finish and anti-adhesion



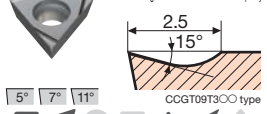
7°

C D R S T V W

AY type

P M K N S H

High-quality ground aluminum breaker achieving excellent machined surface quality



5° 7° 11°

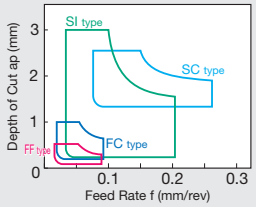
C D R S T V W

Bumpy Chipbreaker | Standard Chipbreaker | Handed Chipbreaker
BREAK MASTER (CBN/PCD) | For Chamfering

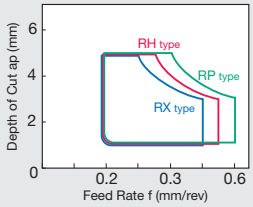
Applicable Work Materials: P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Chipbreaker Application Range

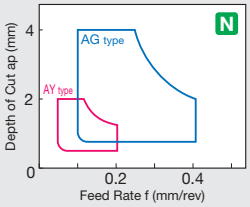
G Class Chipbreaker



Round type Inserts (Inscribed Circle up to 12.7mm)



Aluminum Alloy



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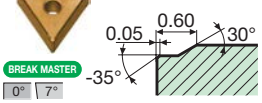
Chipbreaker Selection

SUMIBORON Insert CBN

Finishing to Light Cutting

LV type — P M K N S H

Dramatically improves chip control during hardened steel finishing

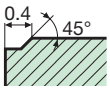


BREAK MASTER 0° 7°

C D R S T V W

FV type — P M K N S H

Dramatically improves chip control during hardened steel finishing



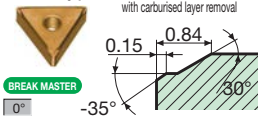
BREAK MASTER 0° 7°

C D R S T V W

Carburised Layer Removal

SV type — P M K N S H

Significantly improved chip control with carburised layer removal



BREAK MASTER 0°

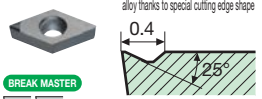
C D R S T V W

SUMIDIA Insert PCD

Finishing to Light Cutting

LD type — P M K N S H

Ideal chipbreaker for finishing of aluminum alloy thanks to special cutting edge shape



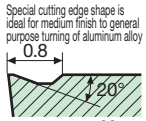
BREAK MASTER 7° 11°

NF-CCMT0602○○ type

C D R S T V W

GD type — P M K N S H

Special cutting edge shape is ideal for medium finish to general purpose turning of aluminum alloy



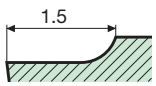
BREAK MASTER 7° 11°

NF-CCMT0602○○ type

C D R S T V W

DM type — P M K N S H

Perfect chipbreaker for high-speed finishing of aluminum alloy



BREAK MASTER 7° 11°

NU-CCMT09T3○○ type

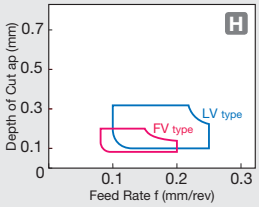
C D R S T V W

Bumpy Chipbreaker | Standard Chipbreaker | Handed Chipbreaker
BREAK MASTER (CBN/PCD) | For Chamfering

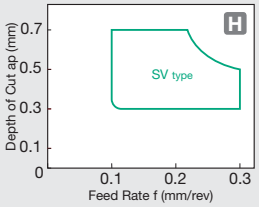
Applicable Work Materials: P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Chipbreaker Application Range

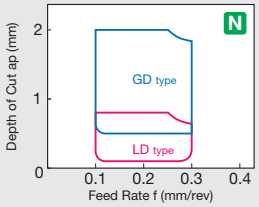
SUMIBORON (Hardened Steel) (Inscribed Circle up to 12.7mm)



SUMIBORON (Carburised Layer Removal) (Inscribed Circle up to 12.7mm)



SUMIDIA (Aluminum Alloy)



Indicated chipbreaker application ranges and shapes are representative values only. Actual values may change according to the actual catalogue number (size, class, etc.). For details, refer to "Stock Items" in Chapter B.

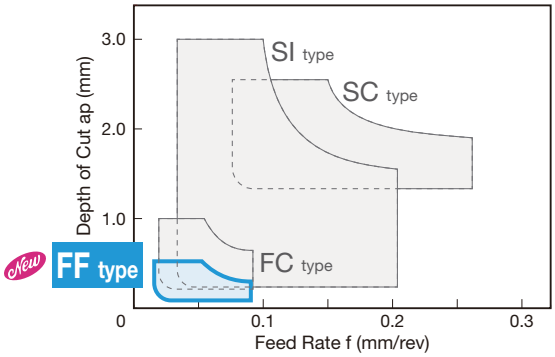
FF type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

New

- Breaks chips in fine cutting conditions where chip control is difficult
- Extensive lineup for external turning and internal boring for various work materials

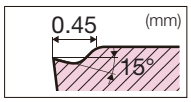
■ Application Range



Features

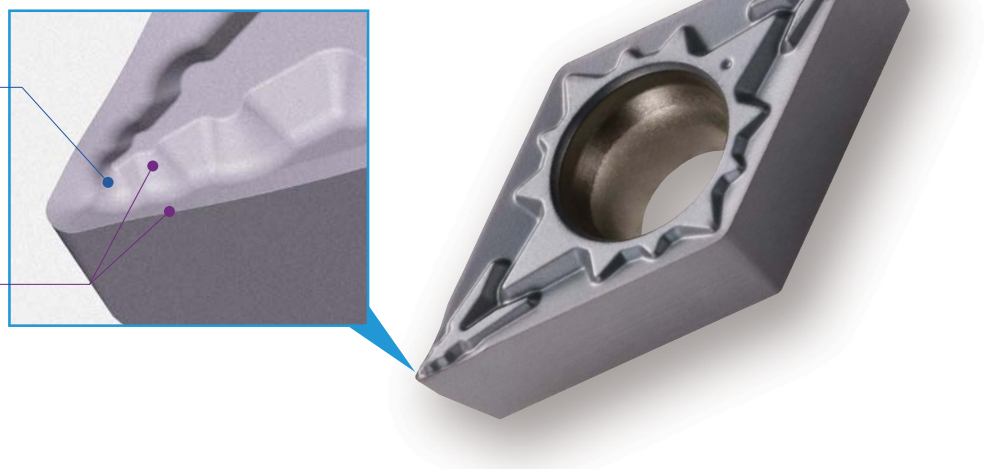
Outstanding chip control in fine cutting conditions

Breaks chips with a protrusion placed near the cutting edge



Cross Section of Chipbreaker

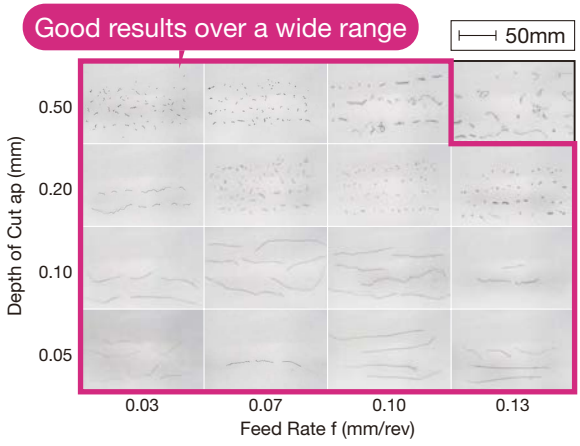
Wavy cutting edge and high-ridge design on the side for chip control in turning applications with fluctuating depths of cut



Cutting Performance

Chip Control Breaks chips in fine cutting conditions

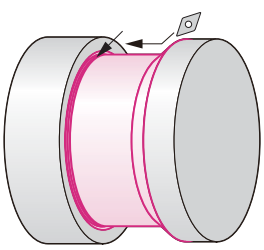
Work Material: SCM415 ø30mm External Turning, Insert: DCGT11T302MN-FF (AC1030U)
Cutting Conditions: vc = 100m/min f = 0.03-0.13mm/rev ap = 0.05-0.50mm Wet

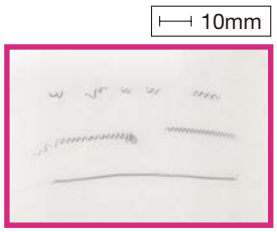


Application Examples

Excellent chip control in turning of tapers and necking operations

Work Material: SCM415 Automotive Parts ø12mm External Turning/Tapering/Necking
Insert: DCGT11T302MN-FF (AC1030U)
Cutting Conditions: vc = 100m/min f = 0.05-0.07mm/rev ap = 0.2-0.3mm Wet





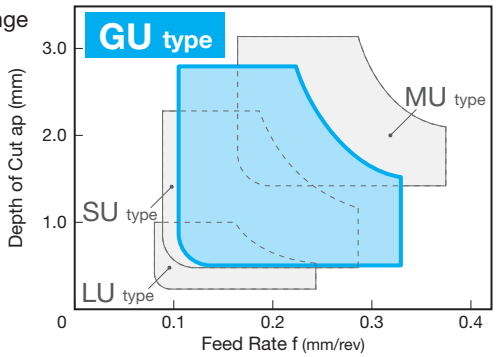
FF type Chipbreaker
(AC1030U)

GU type

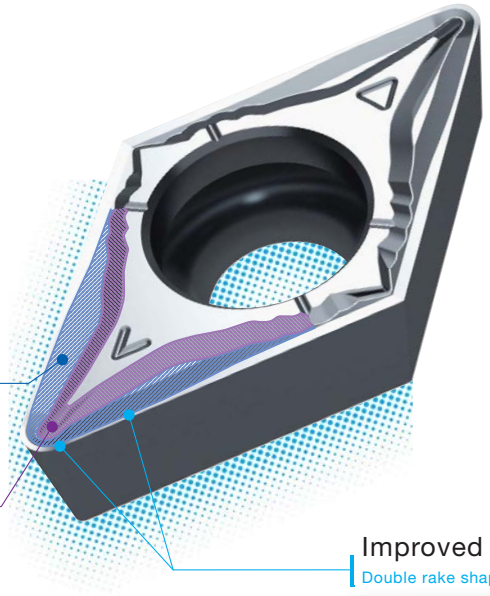
P Steel M Stainless Steel S Exotic Alloy

- Superb versatility handles processes from roughing to finishing.
- Stable turning is realised across a range of conditions through excellent cutting edge sharpness and strength.
- Item range covers a wide variety of applications.

■ Application Range

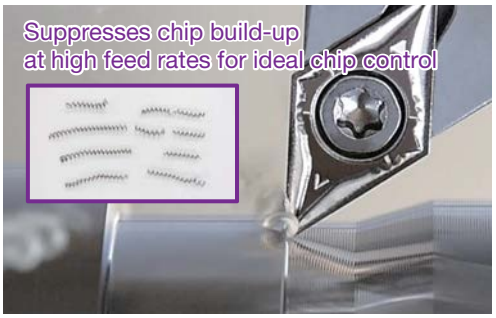


Features

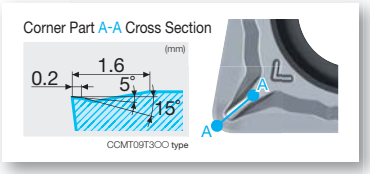


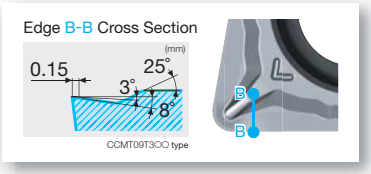
Excellent Chip Control Performance
Wide chip pocket supports various cutting conditions

Low Cutting Force Suppresses Chatter
Protrusion design controls chip flow



Improved Fracture Resistance
Double rake shape with excellent cutting edge sharpness and hardness

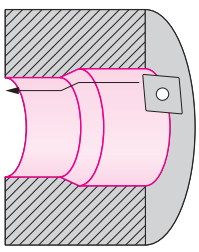


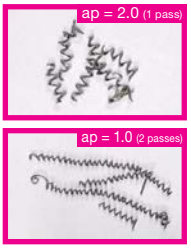


Application Examples

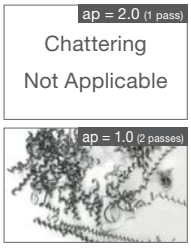
Improves turning efficiency by reducing chip entanglement

Work Material: Automotive Parts (SCM420H) Internal Tapered Boring
Insert: CPMT090308N-GU (AC8025P)
Cutting Conditions: vc = 200m/min f = 0.2mm/rev ap = 2.0mm Wet





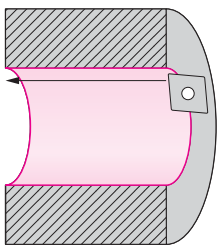
GU type Chipbreaker (AC8025P)



Conventional Tool

Strong design realizes 1.5x longer tool life

Work Material: Fastening Parts (SCr415) Internal Boring
Insert: CCMT09T308N-GU (AC8025P)
Cutting Conditions: vc = 190m/min f = 0.25mm/rev ap = 1.0mm Wet

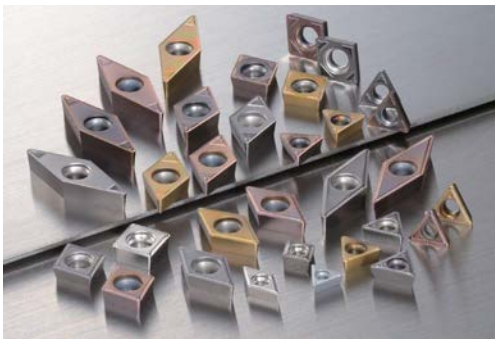


GU type Chipbreaker (AC8025P)

Competitor's Product

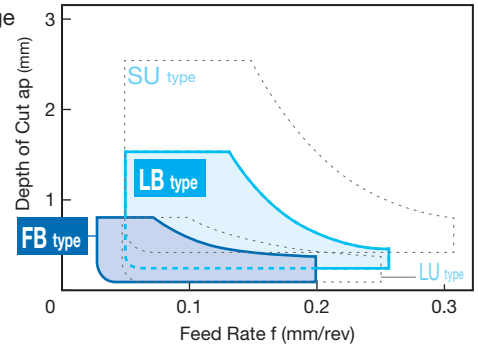
FB/LB type

P Steel

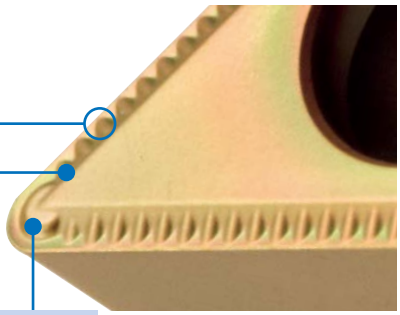


- FB type for finishing and LB type for light cutting have been added to the chipbreaker series for low carbon and general steel machining in addition to the existing LU type for finishing and SU type for light cutting.
- The FB and LB type chipbreakers improve chip control in finishing of low carbon and general steel.

■ Application Range



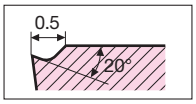
FB type Chipbreaker for Finishing



Ridge reduces edge fracture

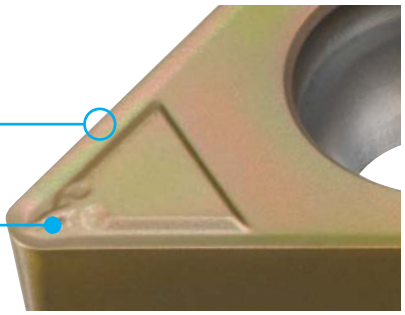
High rake breaker wall improves chip breaking performance

Variable rake angle in corner radius increases chip strain and improves chip breaking performance



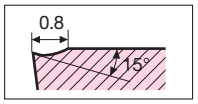
Cross Section of Chipbreaker

LB type Chipbreaker for Light turning



Strengthened edge reduces unexpected fracture

Special breaker ridge shape achieves stable chip control



Cross Section of Chipbreaker

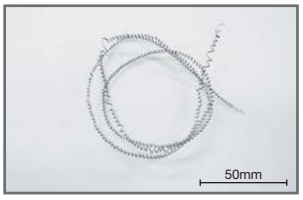
Cutting Performance

Chip Control

Work Material: Pipe material (STKM13A) ø30 Internal Boring, Insert: TPMT110304N-FB (T1500A)
Cutting Conditions: vc = 100m/min, f = 0.12mm/rev, ap = 0.1mm Wet

Achieves stable chip control at small depths of cut and low feeds

FB type Chipbreaker (T1500A)

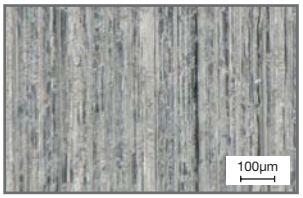


Competitor's Product

Comparison of Surface Roughness of Finished Surfaces

Work Material: Pipe material (STKM13A) ø100 Internal Boring, Insert: TPMT110304N-FB (T1500A)
Cutting Conditions: vc = 200m/min, f = 0.07mm/rev, ap = 0.1mm Wet

FB type Chipbreaker (T1500A)



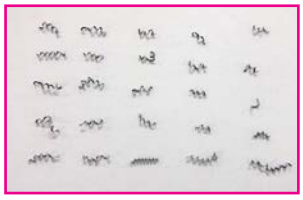
Competitor's Product

Cutting Performance

Chip Control (1)

Work Material: Pipe material (STKM13A) ø30 Internal Boring, Insert: TPMT110304N-LB (T1500A)
Cutting Conditions: vc = 200m/min, f = 0.15mm/rev, ap = 0.5mm Wet

Achieves stable chip control in light cutting

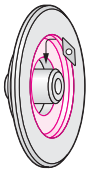


LB type Chipbreaker (T1500A)

Competitor's Product

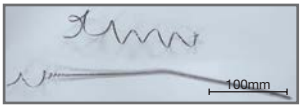
Chip Control (2)

Work Material: Hub (S45C) Insert: VBMT160408N-LB (T1500A)
Cutting Conditions: vc = 240m/min, f = 0.25 to 0.28mm/rev, ap = 0.6mm Wet



LB type Chipbreaker (T1500A)

Competitor's Product



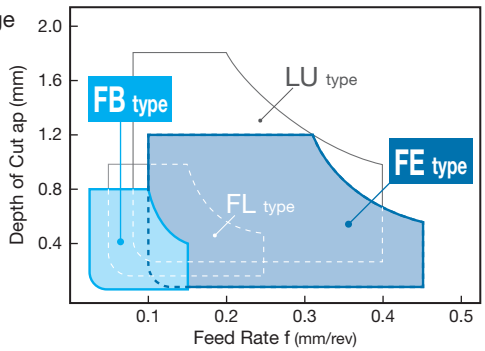
Doubles the tool life by improving chip control and reducing blemishes on machined surfaces

FB/FE type

P Steel

- The FE type main chipbreaker for finishing achieves stable chip evacuation over a wide range of feed rates for low carbon steel and general steel.
- Item range covers a wide variety of turning applications.
- The FB type for low feed finishing increases chip strain and thereby improves chip breaking performance thanks to the variable rake angle in the corner radius.

■ Application Range



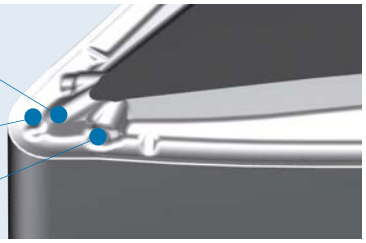
FE type Chipbreaker for Finishing

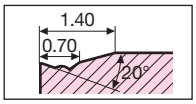
General-purpose to high feed turning

Arc-shaped main breaker design achieves stable chip evacuation over a wide range of feed rates

Two-step breaker achieves stable chip control at low feed rates of f=0.1mm/rev

Sub chipbreaker for chip control during profiling





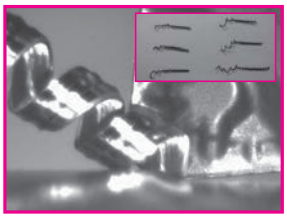
Cross Section of Chipbreaker

Cutting Performance

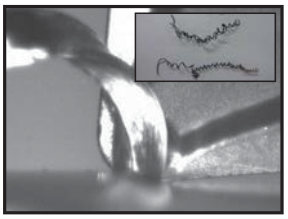
Chip Control

Work Material: Pipe material (STKM13A) Insert: CNMG120408N-FE (AC8025P)
Cutting Conditions: vc = 200m/min, f = 0.4mm/rev, ap = 0.2mm, Dry

Excellent chip control at small depth of cut, high feed conditions



FE type Chipbreaker (AC8025P)



Conventional Tool

Application Examples

Work Material: Iron plate (SPHC440) Facing, Insert: CNMG120408N-FE (AC8025P)
Cutting Conditions: vc = 200m/min, f = 0.15mm/rev, ap = 0.2-0.5mm Wet

Breaks chips with a steady curl even in facing of rolled steel

FE type Chipbreaker (AC8025P)

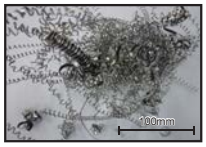
Competitor's Product

Application Examples

Work Material: S53C ø20-100 External Turning/Facing, Insert: DNMG150412N-FE (AC8025P)
Cutting Conditions: vc = 180m/min, f = 0.25mm/rev (Radius Portion), 0.45mm/rev (Straight Portion), ap = 0.3mm Wet

Stable chip control even at small depth of cut and variable feed conditions

FE type Chipbreaker (AC8025P)



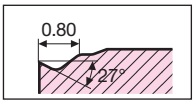
Conventional Tool

FB type Chipbreaker for Low Feed Finishing

Low feed turning

High-rake and smooth breaker connection achieves ultra-low cutting force

Variable rake angle in corner radius increases chip strain and improves chip breaking performance

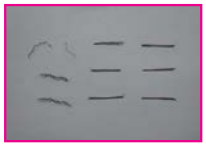


Cross Section of Chipbreaker

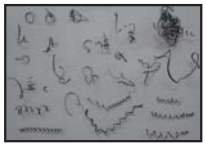
Application Examples

Work Material: Pipe material (STKM13C) Internal Boring, Insert: DNMG150404N-FB (T3000Z)
Cutting Conditions: vc = 352m/min, f = 0.03-0.2mm/rev, ap = 0.7mm Wet

Small curls of chips even for pipe material, achieving a steady chip length



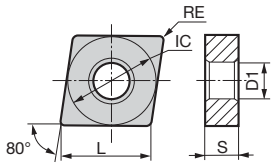
FB type Chipbreaker (T3000Z)

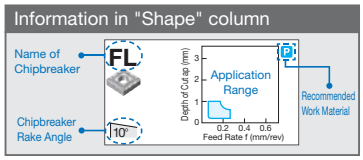


Competitor's Product

80° Diamond type Negative Inserts

CN 80° Diamond type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

CN■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Applicable External Holders C11 | Applicable Boring Bars E23 to E25

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	CVD AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FB 27°	(ap) 2 1 0 0.2 0.4 (f) P	CNMG 090304N-FB	0.4										●																	●	●	▲		●						
			090308N-FB	0.8										●																	●	●	▲		●						
	FL 10°	(ap) 2 1 0 0.2 0.4 (f) P	CNMG 090308N-FL	0.8			●			●						●																									
	FE 20°	(ap) 2 1 0 0.2 0.4 (f) P	CNMG 090304N-FE	0.4	●	●	●	●	●		●		●	●																	●	●	▲		●						
			090308N-FE	0.8	●	●	●	●	●		●		●	●																	●	●	▲		●						
Finishing	LU 10°	(ap) 2 1 0 0.2 0.4 (f) P	CNMG 090304N-LU	0.4	●	●	●		●	●				●		●															●	●	▲		●						
			090308N-LU	0.8	●	●	●		●	●				●		●															●	●	▲		●						
	SU 13°	(ap) 2 1 0 0.2 0.4 (f) P M S	CNMG 090304N-SU	0.4	●	●	●			●																															
			090308N-SU	0.8	●	●	●			●																															
Medium Cutting	GU 7°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	CNMG 090304N-GU	0.4	●	●	●	●		●	●						●	●																							
			090308N-GU	0.8	●	●	●	●		●	●						●	●																							
	UX 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P K	CNMG 090304N-UX	0.4				●			●																													
			090308N-UX	0.8				●			●																													
	UG 4°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	CNMG 090304N-UG	0.4			●	●		●	●																													
			090308N-UG	0.8			●	●		●	●																													

CN■■09T3●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

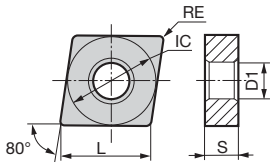
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	CVD AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	SU 13°	(ap) 2 1 0 0.2 0.4 (f) P M S	CNMG 09T304N-SU	0.4	●	●	●			●																															
			09T308N-SU	0.8	●	●	●			●																															
Medium Cutting	UG 4°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	CNMG 09T304N-UG	0.4			●			●																															
			09T308N-UG	0.8			●			●																															

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

CN■■0904●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

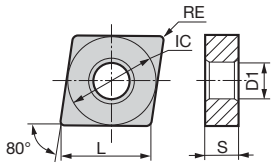
Applicable External Holders ☞ C11

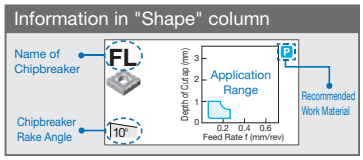
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC5003U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FB** 27°	(ap) 2 1 0 0.2 0.4 (f) P	CNMG 090404N-FB	0.4										●																●	●	▲		●								
			090408N-FB	0.8										●																●	●	▲		●								
	FE 20°	(ap) 2 1 0 0.2 0.4 (f) P	CNMG 090404N-FE	0.4	●	●	●	●	●		●	●	●	●																●	●	▲		●								
			090408N-FE	0.8	●	●	●	●	●		●	●	●	●																●	●	▲		●								
Finishing	**SU** 13°	(ap) 2 1 0 0.2 0.4 (f) P M S	CNMG 090404N-SU	0.4	●	●	●		●	●	●																			●			●	●								
			090408N-SU	0.8	●	●	●		●	●	●																			●			●	●								
			090412N-SU	1.2	●	●	●	●	●		●																			●			●	●								
	SEW → B131 Wiper 5°	(ap) 4 2 0 0.2 0.5 0.8 (f) P	CNMG 090404N-SEW	0.4	●	●	●	●	●		●																															
			090408N-SEW	0.8	●	●	●	●	●		●																															
	EF 20°	(ap) 2 1 0 0.2 0.4 (f) M S	CNMG 090404N-EF	0.4								●	●	●									●	●	●																	
			090408N-EF	0.8								●	●	●									●	●	●																	
Medium Cutting	**GU** 7°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	CNMG 090404N-GU	0.4			●		●		●																			●			●	●								
			090408N-GU	0.8			●		●		●																			●			●	●								
			090412N-GU	1.2	●	●	●	●	●		●						●	●												●			●	●								
	UG 4°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	CNMG 090404N-UG	0.4			●			●																															
			090408N-UG	0.8			●	●		●	●																															
	EG 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) M	CNMG 090408N-EG	0.8								●	●	●									●	●	●																	
			090412N-EG	1.2								●	●	●									●	●	●																	
Medium to Roughing	**GZ** 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) K	CNMG 090408N-GZ	0.8													●	●	●	▲	▲																					
			090412N-GZ	1.2													●	●	●	▲	▲																					

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

CN■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.9	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

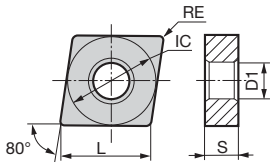
SUMIBORON (CBN) Inserts L34 on
SUMIDIA (PCD) Inserts M10
Ceramic Inserts B128
Applicable External Holders C10 to C12
Applicable Boring Bars E15, E23 to E25

					Coated Carbide																											Coated Cermet			Cermet	Cemented Carbide								
					CVD								PVD	CVD							PVD											PVD											
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FB** 27°		CNMG 120402N-FB	0.2										●																●	●	▲	●	●							
			120404N-FB	0.4										●																●	●	▲	●	●							
			120408N-FB	0.8										●																●	●	▲	●	●							
	FA 20°		CNMG 120402N-FA	0.2																										●	●	▲	●	●							
			120404N-FA	0.4																										●	●	▲	●	●							
			120408N-FA	0.8																										●	●	▲	●	●							
	FL 10°		CNMG 120404N-FL	0.4			●			●						●							●	●	●		●				●	●	▲	●	●							
			120408N-FL	0.8			●			●						●							●	●	●		●				●	●	▲	●	●							
	FE 20°		CNMG 120402N-FE	0.2	●	●	●	●	●		●			●																●	●	▲	●	●							
			120404N-FE	0.4	●	●	●	●	●		●			●																●	●	▲	●	●							
			120408N-FE	0.8	●	●	●	●	●		●			●																●	●	▲	●	●							
			120412N-FE	1.2	●	●	●	●	●		●			●																●	●	▲	●	●							
Finishing	**LU** 10°		CNMG 120402N-LU	0.2										●		●														●	●	▲	●	●							
			120404N-LU	0.4	●	●	●	●	●	●	●			●		●														●	●	▲	●	●							
			120408N-LU	0.8	●	●	●	●	●	●	●			●		●														●	●	▲	●	●							
			120412N-LU	1.2	●	●	●	●	●	●	●			●		●														●	●	▲		●							
			120416N-LU	1.6																																					
	LUW 10° B131 Wiper		CNMG 120404N-LUW	0.4	●	●	●		●	●				●		●														●	●	▲		●							
			120408N-LUW	0.8	●	●	●		●	●				●		●														●	●	▲		●							
			120412N-LUW	1.2	●	●	●		●	●				●		●														●	●	▲		●							
	SU 13°		CNMG 120402N-SU	0.2								●	●	●		●						●	●	●		●		●		●	●	▲	●	●							
			120404N-SU	0.4	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●	●		●		●	●	▲	●	●							
			120408N-SU	0.8	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●	●		●		●	●	▲	●	●							
			120412N-SU	1.2	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●	●		●		●	●	▲	●	●							
	SU 13°		CNGG 120402N-SU	0.2																			●	●	●					●	●	▲	●	●							
			120404N-SU	0.4																			●	●	●					●	●	▲	●	●							
			120408N-SU	0.8																			●	●	●					●	●		●	●							
	SE 5°		CNMG 120404N-SE	0.4	●	●	●	●	●	●	●																			●	●		●	●							
			120408N-SE	0.8	●	●	●	●	●	●	●																			●	●		●	●							
			120412N-SE	1.2	●	●	●	●	●	●	●																														
			120416N-SE	1.6																																					
	SEW 5° B131 Wiper		CNMG 120404N-SEW	0.4	●	●	●			●	●																			●	●			●							
			120408N-SEW	0.8	●	●	●			●	●																			●	●			●							
			120412N-SEW	1.2	●	●	●			●	●																														
	EF 20°		CNMG 120404N-EF	0.4	●	●	●	●				●	●	●		●							●	●	●	●													●	●	
			120408N-EF	0.8	●	●	●	●				●	●	●		●							●	●	●	●													●	●	
			120412N-EF	1.2	●	●	●	●				●	●	●		●							●	●	●		●													●	●	
	EF 20°		CNGG 120402N-EF	0.2												●							●	●	●	●													●	●	
			120404N-EF	0.4												●							●	●	●	●													●	●	
			120408N-EF	0.8												●							●	●	●	●													●	●	

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

CN■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.9	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

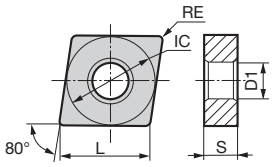
SUMIBORON (CBN) Inserts L34 on
SUMIDIA (PCD) Inserts M10
Ceramic Inserts B128
Applicable External Holders C10 to C12
Applicable Boring Bars E15, E23 to E25

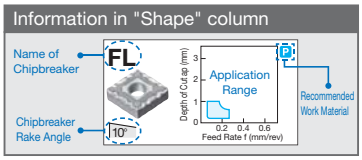
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	PVD AC6020M	AC6030M	AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	ST10P	Cemented Carbide ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	**SX** 3°	(ap) 2 1 0 0.2 0.4 (f) P	CNMG 120404N-SX	0.4	●	●	●	●	●	●	●																				●	●	▲		●							
			120408N-SX	0.8	●	●	●	●	●	●	●																				●	●	▲		●							
			120412N-SX	1.2	●	●	●	●	●	●	●																																
	EX 16°	(ap) 3 2 1 0 0.2 0.4 (f) M S	CNMG 120404N-EX	0.4								●	●	●	▲	●							●	●	●	●	●		●													
			120408N-EX	0.8								●	●	●	▲	●							●	●	●	●	●		●													
			120412N-EX	1.2								●	●	●	▲	●							●	●	●	●	●		●													
			120416N-EX	1.6																																						
	UP 10°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) M S	CNMG 120404N-UP	0.4						●	●	●	●	●		●							●	●	●	●	●		●										●			
			120408N-UP	0.8						●	●	●	●	●	▲	●							●	●	●	●	●		●										●			
			120412N-UP	1.2						●	●	●	●	●		●							●	●	●	●	●		●										●			
Medium Cutting	**GU** 7°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	CNMG 120404N-GU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●	●					●	●	●		●		●			●	●		●								
			120408N-GU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●	●					●	●	●		●		●			●	●		●								
			120412N-GU	1.2	●	●	●	●	●	●	●	●	●	●	▲	●	●					●	●	●		●		●														
			120416N-GU	1.6	●	●	●	●		●	●						●	●																								
	GE 3°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P	CNMG 120404N-GE	0.4	●	●	●	●	●	●	●																														
			120408N-GE	0.8	●	●	●	●	●	●	●																														
			120412N-GE	1.2	●	●	●	●	●	●	●																														
			120416N-GE	1.6	●	●	●	●	●	●	●																														
	GUW 0° → B131 Wiper	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P	CNMG 120408N-GUW	0.8	●	●	●		●	●																														
			120412N-GUW	1.2	●	●	●		●	●																														
	UX 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P K	CNMG 120404N-UX	0.4	●	●	●	●	●	●	●																														
			120408N-UX	0.8	●	●	●	●	●	●	●																														
			120412N-UX	1.2	●	●	●	●	●	●	●																														
			120416N-UX	1.6	●	●	●	●	●	●	●																														
	UG 4°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	CNMG 120404N-UG	0.4			●	●		●	●																										●					
			120408N-UG	0.8			●	●		●	●																										●					
			120412N-UG	1.2			●	●		●	●																														
			120416N-UG	1.6			●	●		●	●																														
	EG 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) M	CNMG 120404N-EG	0.4	●	●	●	●				●	●	●									●	●	●															●	●	
			120408N-EG	0.8	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●	
			120412N-EG	1.2	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●	
			CNMA 120404	0.4													●	●	●	▲	▲																					
			120408	0.8													●	●	●	▲	▲		●	●	●	●																
			120412	1.2													●	●	●	▲	▲																					
			120416	1.6													●	●	●	▲	▲																					
			CNGA 120402	0.2																		●																				
			120404	0.4																		●																				
			120408	0.8																		●																				

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

CN■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.9	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

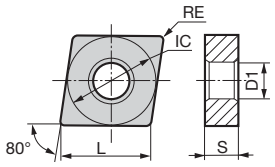
SUMIBORON (CBN) Inserts L34 on
SUMIDIA (PCD) Inserts M10
Ceramic Inserts B128
Applicable External Holders C10 to C12
Applicable Boring Bars E15, E23 to E25

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	CVD: AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	**MU**	P M S	CNMG 120408N-MU	0.8	●	●	●	●	●	●	●		●			●							●	●	●	●	●		●														
	4°		120412N-MU	1.2	●	●	●	●	●	●	●		●			●							●	●	●	●	●		●														
			120416N-MU	1.6	●	●	●	●	●	●	●												●	●	●		●		●														
	EM	M S	CNMG 120408N-EM	0.8	●	●	●	●				●	●	●									●	●	●																		
	0°		120412N-EM	1.2	●	●	●	●				●	●	●									●	●	●																		
			120416N-EM	1.6	●	●	●	●				●	●	●									●	●	●																		
	ME	P	CNMG 120408N-ME	0.8	●	●	●	●	●	●	●						●	●																								
	4°		120412N-ME	1.2	●	●	●	●	●	●	●						●	●																								
			120416N-ME	1.6	●	●	●	●	●	●	●						●	●																								
	MX	P	CNMG 120408N-MX	0.8		●	●	●		●	●																															
	-15°		120412N-MX	1.2		●	●	●		●	●																															
			120416N-MX	1.6		●	●			●																																
	UZ	K	CNMG 120404N-UZ	0.4			●			●							●	●	●	▲	▲																					
	4°		120408N-UZ	0.8			●	●		●	●						●	●	●	▲	▲		●	●	●	●	●												●	●		
			120412N-UZ	1.2			●	●		●	●						●	●	●	▲	▲		●	●	●	●	●													●		
			120416N-UZ	1.6			●			●							●	●	●	▲	▲																					
	GZ	K	CNMG 120404N-GZ	0.4						●							●	●	●	▲	▲																					
	0°		120408N-GZ	0.8						●							●	●	●	▲	▲																					
			120412N-GZ	1.2						●							●	●	●	▲	▲																					
			120416N-GZ	1.6						●							●	●	●	▲	▲																					
Roughing	**MP**	P	CNMM 120408N-MP	0.8	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●																
	0°		120412N-MP	1.2	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●																
			120416N-MP	1.6	●	●	●	●	●	●	●	●	●			●							●	●	●	●																
	HG	P	CNMM 120408N-HG	0.8	●	●	●	●	●	●	●					●																									
	0°		120412N-HG	1.2	●	●	●	●	●	●	●					●																									
			120416N-HG	1.6			●			●																															
	HP	P	CNMM 120408N-HP	0.8			●	●		●	●					●																									
	0°		120412N-HP	1.2			●	●		●	●					●																									
			120416N-HP	1.6			●	●		●	●					●																									

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

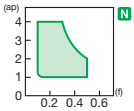
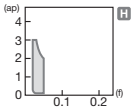
CN■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.9	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application

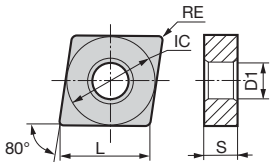
		Coated Carbide																								Coated Cermet		Cermet	Cemented Carbide								
		CVD							PVD	CVD					PVD							PVD															
		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
P	Steel	●	◔	◕	✖	○	◔	✪		◔		◔										✪		✪	◕			◕	✖	✪	●	◕							
M	Stainless Steel			✪				✪	●	◕	✖	○	◔									✪		✪	◕	✪													
K	Cast Iron			✪			✪							●	◕	✖	○	◔				✪		✪	◕						●								
N	Non-Ferrous Metal																																				◕
S	Exotic Alloy																		●	◕	✖	○	◔	✪	✪													
H	Hardened Steel																		●																			

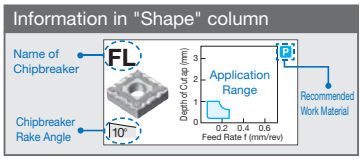
SUMIBORON (CBN) Inserts ☞ L34 on
SUMIDIA (PCD) Inserts ☞ M10
Ceramic Inserts ☞ B128
Applicable External Holders ☞ C10 to C12
Applicable Boring Bars ☞ E15, E23 to E25

	Shape	Application Range	Cat. No.	Corner Radius RE
For Aluminum	**AX** 30°		**CNGG 120402R-AX**	0.2
			120402L-AX	0.2
			120404R-AX	0.4
			120404L-AX	0.4
			120408R-AX	0.8
			120408L-AX	0.8
Light Cutting of Hardened Steel	**GH** 3°		**CNGG 120402N-GH**	0.2
			120404N-GH	0.4
			120408N-GH	0.8

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

CN■■1606●●

Dimensions (mm)	Cutting Edge Length L	16.1	Thickness S	6.35
	Inscribed Circle IC	15.875	Hole Dia. D1	6.35

Applicable External Holders ☞ C10 to C12

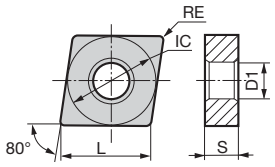
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	Cemented Carbide: T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	EX		CNMG 160612N-EX	1.2																			●	●	●	●	●															
	UP		CNMG 160608N-UP	0.8																																						
			160612N-UP	1.2																																						
Medium Cutting	GU		CNMG 160608N-GU	0.8	●	●	●	●	●	●	●		●	●			●	●																								
			160612N-GU	1.2	●	●	●	●	●	●	●		●	●			●	●																								
			160616N-GU	1.6	●	●	●	●	●	●	●		●	●			●	●																								
	GE		CNMG 160608N-GE	0.8	●	●	●	●	●	●	●																														
			160612N-GE	1.2	●	●	●	●	●	●	●																														
			160616N-GE	1.6	●	●	●	●	●	●	●																														
	GUW → B131 Wiper		CNMG 160612N-GUW	1.2	●	●	●	●	●	●	●																														
	UX		CNMG 160608N-UX	0.8	●	●	●	●	●	●	●																														
			160612N-UX	1.2	●	●	●	●	●	●	●																														
			160616N-UX	1.6	●	●	●	●	●	●	●																														
	UG		CNMG 160608N-UG	0.8				●			●																														
			160612N-UG	1.2				●			●																														
			160616N-UG	1.6				●	●		●	●																														
	EG		CNMG 160608N-EG	0.8	●	●	●	●				●	●	●									●	●	●	●	●															
			160612N-EG	1.2	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●	
			160616N-EG	1.6	●	●	●	●				●	●	●									●	●	●	●	●															
			CNMA 160608	0.8													●	●	●	▲	▲																				
			160612	1.2													●	●	●	▲	▲																				
			160616	1.6													●	●	●	▲	▲																				
Medium to Roughing	MU		CNMG 160608N-MU	0.8	●	●	●	●	●	●	●												●	●	●	●	●															
			160612N-MU	1.2	●	●	●	●	●	●	●		●			●							●	●	●	●	●													●	●	
			160616N-MU	1.6	●	●	●	●	●	●	●		●			●							●	●	●	●	●															
	EM		CNMG 160608N-EM	0.8	●	●	●	●				●	●	●									●	●	●																	
			160612N-EM	1.2	●	●	●	●				●	●	●									●	●	●																	
			160616N-EM	1.6	●	●	●	●				●	●	●									●	●	●																	
	ME		CNMG 160608N-ME	0.8	●	●	●	●	●	●	●							●	●																						
			160612N-ME	1.2	●	●	●	●	●	●	●							●	●																						
			160616N-ME	1.6	●	●	●	●	●	●	●							●	●																						

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

CN■■1606●●

Dimensions (mm)	Cutting Edge Length L	16.1	Thickness S	6.35
	Inscribed Circle IC	15.875	Hole Dia. D1	6.35

Recommended Application

		Coated Carbide																				Coated Cermet		Cermet	Cemented Carbide					
		CVD								PVD		CVD					PVD					PVD								
	Shape	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC5003U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	**MX**																																					
	CNMG 160608N-MX		●	●			●																															
	160612N-MX		●	●	●		●	●																														
	160616N-MX		●	●	●		●	●																														
	UZ																																					
	CNMG 160608N-UZ			●	●		●	●																														
	160612N-UZ			●	●		●	●						●	●	●	▲	▲																				
	160616N-UZ			●	●		●	●						●	●	●	▲	▲																				
	GZ																																					
	CNMG 160608N-GZ													●	●	●	▲	▲																				
	160612N-GZ													●	●	●	▲	▲																				
	160616N-GZ													●	●	●	▲	▲																				
Roughing	**MP**																																					
	CNMM 160608N-MP			●	●		●	●		●										●	●	●	●															
	160612N-MP	●	●	●	●	●	●	●		●										●	●	●	●															
	160616N-MP	●	●	●	●	●	●	●		●										●	●	●	●															
Heavy Cutting	**HG**																																					
	CNMM 160612N-HG	●	●	●	●	●	●	●																														
	160616N-HG	●	●	●	●	●	●	●																														
	HP																																					
	CNMM 160608N-HP			●	●		●	●																														
	160612N-HP			●	●		●	●																														
	160616N-HP			●	●		●	●																														

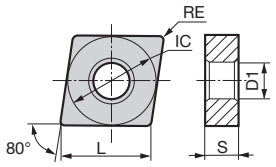
Shape	Application Range	Cat. No.	Corner Radius RE
MX	P	CNMG 160608N-MX	0.8
		160612N-MX	1.2
		160616N-MX	1.6
UZ	K	CNMG 160608N-UZ	0.8
		160612N-UZ	1.2
		160616N-UZ	1.6
GZ	K	CNMG 160608N-GZ	0.8
		160612N-GZ	1.2
		160616N-GZ	1.6
MP	P M	CNMM 160608N-MP	0.8
		160612N-MP	1.2
		160616N-MP	1.6
HG	P	CNMM 160612N-HG	1.2
		160616N-HG	1.6
HP	P	CNMM 160608N-HP	0.8
		160612N-HP	1.2
		160616N-HP	1.6

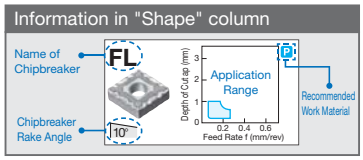
Applicable External Holders C10 to C12

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

CN■■1906●●

Dimensions (mm)	Cutting Edge Length L	19.3	Thickness S	6.35
	Inscribed Circle IC	19.05	Hole Dia. D1	7.94

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

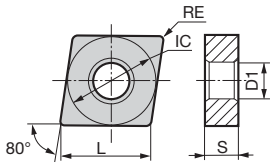
Applicable External Holders ☞ C10 to C12 | Applicable Boring Bars ☞ E24, E25

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	CVD/PVD: AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	EX		CNMG 190612N-EX	1.2																			●	●	●	●	●															
	UP		CNMG 190612N-UP	1.2						●	●																												●			
Medium Cutting	GE		CNMG 190612N-GE	1.2	●	●	●	●	●	●	●																															
			190616N-GE	1.6	●	●	●	●	●	●	●																															
	UX		CNMG 190608N-UX	0.8				●			●																															
			190612N-UX	1.2	●	●	●	●	●	●	●																															
			190616N-UX	1.6	●	●	●	●	●	●	●																															
	UG		CNMG 190604N-UG	0.4																																					
			190608N-UG	0.8				●			●																															
			190612N-UG	1.2			●	●		●	●																															
			190616N-UG	1.6			●	●		●	●																															
			190624N-UG	2.4																																					
	EG		CNMG 190612N-EG	1.2	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●	
			190616N-EG	1.6	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●	
			CNMA 190608	0.8																																					
			190612	1.2													●	●	●	▲	▲																				
			190616	1.6													●	●	●	▲	▲																				
Medium to Roughing	MU		CNMG 190608N-MU	0.8				●			●																															
			190612N-MU	1.2	●	●	●	●	●	●	●	●				●							●	●	●	●	●														
			190616N-MU	1.6	●	●	●	●	●	●	●	●				●							●	●	●	●	●														
			190624N-MU	2.4	●	●	●	●	●	●	●												●	●	●	●	●														
	EM		CNMG 190612N-EM	1.2	●	●	●	●				●	●	●									●	●	●																
			190616N-EM	1.6	●	●	●	●				●	●	●									●	●	●																
			190624N-EM	2.4	●	●	●	●				●	●	●									●	●	●																
	ME		CNMG 190612N-ME	1.2	●	●	●	●	●	●	●							●	●																					
			190616N-ME	1.6	●	●	●	●	●	●	●							●	●																					
			190624N-ME	2.4	●	●	●	●	●	●	●							●	●																					
	MX		CNMG 190612N-MX	1.2		●	●	●		●	●																															
			190616N-MX	1.6		●	●	●		●	●																															
	UZ		CNMG 190608N-UZ	0.8			●	●		●	●																															
			190612N-UZ	1.2			●	●		●	●							●	●	▲	▲																				
			190616N-UZ	1.6			●	●		●	●							●	●	▲	▲																				

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

CN■■1906●●

Dimensions (mm)	Cutting Edge Length L	19.3	Thickness S	6.35
	Inscribed Circle IC	19.05	Hole Dia. D1	7.94

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Applicable External Holders C10 to C12 | Applicable Boring Bars E24, E25

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	**GZ**	K	**CNMG 190612N-GZ**	1.2													●	●	●	▲	▲																						
			190616N-GZ	1.6													●	●	●	▲	▲																						
Roughing	**MP**	P M	**CNMM 190608N-MP**	0.8			●	●		●	●		●			●							●	●	●	●																	
			190612N-MP	1.2	●	●	●	●	●	●	●	●	●			●							●	●	●	●																	
			190616N-MP	1.6	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●																	
			190624N-MP	2.4	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●																	
Heavy Cutting	**HG**	P	**CNMM 190612N-HG**	1.2	●	●	●	●	●	●	●					●																										
			190616N-HG	1.6	●	●	●	●	●	●	●					●																										
			190624N-HG	2.4	●	●	●	●	●	●	●					●																										
	HP	P	**CNMM 190608N-HP**	0.8			●	●		●	●					●																										
			190612N-HP	1.2			●	●		●	●					●																										
			190616N-HP	1.6			●	●		●	●					●																										
			190624N-HP	2.4			●	●		●	●					●																										
	HF	P	**CNMM 190616N-HF**	1.6			●	●		●	●																															
			190624N-HF	2.4			●	●		●	●																															

CN■■2507●●

Dimensions (mm)	Cutting Edge Length L	25.8	Thickness S	7.94
	Inscribed Circle IC	25.4	Hole Dia. D1	9.12

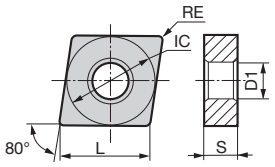
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

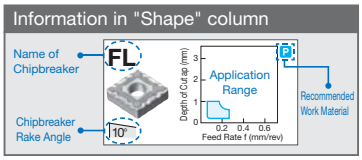
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Roughing	**MP**	P	**CNMM 250724N-MP**	2.4			●			●																																

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Negative Inserts

CN 80° Diamond type / Negative / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

CN■■2509●●

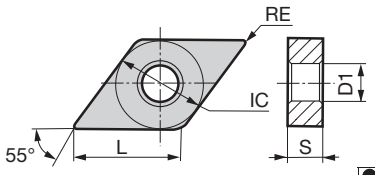
Dimensions (mm)	Cutting Edge Length L	25.8	Thickness S	9.52
	Inscribed Circle IC	25.4	Hole Dia. D1	9.12

Recommended Application

| | | |

55° Diamond type Negative Inserts

DN 55° Diamond type **Negative With Hole**



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

DN■■1104●●

Dimensions (mm)	Cutting Edge Length L	11.6	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

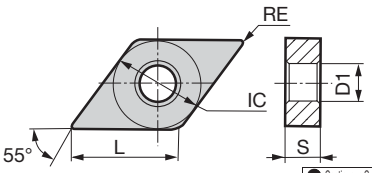
SUMIBORON (CBN) Inserts ☞ L54
Applicable External Holders ☞ C16
Applicable Boring Bars ☞ E32, E33

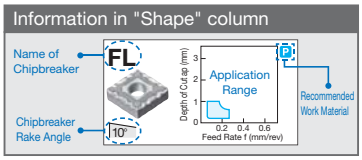
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	CVD AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FB** 27°	(ap) 2 1 0 0.2 0.4 (f) P	DNMG 110404N-FB	0.4										●																●	●	▲		●							
			110408N-FB	0.8										●																●	●	▲		●							
	FE 20°	(ap) 2 1 0 0.2 0.4 (f) P	DNMG 110404N-FE	0.4	●	●	●	●	●		●	●	●	●																●	●	▲		●							
			110408N-FE	0.8	●	●	●	●	●		●	●	●	●																●	●	▲		●							
			110412N-FE	1.2	●	●	●	●	●		●	●	●	●																●	●	▲		●							
Finishing	**LU** 10°	(ap) 2 1 0 0.2 0.4 (f) P	DNMG 110404N-LU	0.4	●	●	●			●		●			●																			●							
			110408N-LU	0.8	●	●	●			●		●			●																			●							
	SU 13°	(ap) 2 1 0 0.2 0.4 (f) P M S	DNMG 110404N-SU	0.4	●	●	●	●	●	●	●	●	●	●																●											
			110408N-SU	0.8	●	●	●	●	●	●	●	●	●	●																●											
			110412N-SU	1.2	●	●	●	●	●	●	●	●	●	●																●											
	SE 5°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P	DNMG 110408N-SE	0.8	●	●	●	●	●	●	●																														
	SEW 5° → B131 Wiper	(ap) 4 2 0 0.2 0.5 0.8 (f) P	DNMX 110404N-SEW	0.4	●	●	●	●	●	●	●																														
			110408N-SEW	0.8	●	●	●	●	●	●	●																														
			110412N-SEW	1.2	●	●	●	●	●	●	●																														
	EF 20°	(ap) 2 1 0 0.2 0.4 (f) M S	DNMG 110404N-EF	0.4	●	●	●	●				●	●	●									●	●	●		●															
			110408N-EF	0.8	●	●	●	●				●	●	●									●	●	●		●															
			110412N-EF	1.2	●	●	●	●				●	●	●									●	●	●		●															
Medium Cutting	**GU** 7°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	DNMG 110404N-GU	0.4	●	●	●	●		●	●	●	●	●			●	●	●																●							
			110408N-GU	0.8	●	●	●	●		●	●	●	●	●			●	●	●																●							
			110412N-GU	1.2	●	●	●	●	●	●	●	●	●	●				●	●														●									
	GE 3°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P	DNMG 110408N-GE	0.8	●	●	●	●	●	●	●																														
			110412N-GE	1.2	●	●	●	●	●	●	●																														
	UX 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P K	DNMG 110408N-UX	0.8	●	●	●	●			●																														
	UG 4°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	DNMG 110404N-UG	0.4			●	●		●	●																														
			110408N-UG	0.8			●	●		●	●																														
	EG 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) M	DNMG 110408N-EG	0.8	●	●	●	●				●	●	●									●	●	●		●															
			110412N-EG	1.2	●	●	●	●				●	●	●									●	●	●		●															

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Negative Inserts

DN 55° Diamond type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

DN■■1104●●

Dimensions (mm)	Cutting Edge Length L	11.6	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

SUMIBORON (CBN) Inserts L54
Applicable External Holders C16 Applicable Boring Bars E32, E33

Recommended Application		Coated Carbide																								Coated Cermet			Cermet	Cemented Carbide				
		CVD								PVD	CVD					PVD							PVD												
		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
P	Steel	●	◔	●	✖	○	◔	✲		◔											✲	✲	✲	✲	●			◔	✖	✲	●	●							
M	Stainless Steel			✲			✲	●	●	✖	○	◔									✲		✲	✲	●	✲												
K	Cast Iron			✲			✲						●	●	✖	○	◔					✲		✲	●			●										
N	Non-Ferrous Metal																																				●
S	Exotic Alloy																		●	●	✖	◔	✲	✲														
H	Hardened Steel																	●																				
Medium Cutting	UM	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—	—	—	—	—	—	—	●	●	●	●	●	—	—	—	●	●	—
	GNGA	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Medium to Roughing	GZ	—	—	—	—	—	—	—	—	—	—	—	●	●	●	●	▲	▲	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Shape	Application Range	Cat. No.	Corner Radius RE
UM (0°)	P	DNGG 110404R-UM	0.4
		110404L-UM	0.4
		110408R-UM	0.8
		110408L-UM	0.8
GNGA (0°)		DNGA 110404	0.4
		110408	0.8
GZ (0°)	K	DNMG 110408N-GZ	0.8
		110412N-GZ	1.2

DN■■1504●●

Dimensions (mm)	Cutting Edge Length L	15.5	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

SUMIBORON (CBN) Inserts L54 on SUMIDIA (PCD) Inserts M12
SUMIDIA BINDERLESS Inserts M28 Ceramic Inserts B128
Applicable External Holders C14 to C16 Applicable Boring Bars E15, E31 to E33

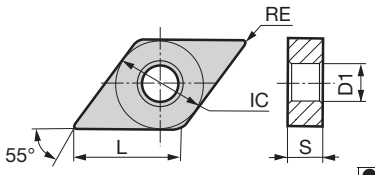
Recommended Application		Coated Carbide																								Coated Cermet			Cermet	Cemented Carbide				
		CVD								PVD	CVD					PVD							PVD												
		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
P	Steel	●	◔	●	✖	○	◔	✲		◔											✲	✲	✲	✲	●			◔	✖	✲	●	●							
M	Stainless Steel			✲			✲	●	●	✖	○	◔									✲		✲	✲	●	✲												
K	Cast Iron			✲			✲						●	●	✖	○	◔					✲		✲	●			●										
N	Non-Ferrous Metal																																				●
S	Exotic Alloy																		●	●	✖	◔	✲	✲														
H	Hardened Steel																	●																				
Fine Cutting	FB	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	▲	●	●	—	—	—	—	—	—
	FA	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	▲	●	●	—	—	—	—	—	—
	FL			●			●						●						—	—	—	—	—	—	—	—	—	●	●	▲	●	●						
	FE	●	●	●	●	●		●		●	●								—	—	—	—	—	—	—	—	—	●	●	▲	●	●						
Finishing	LU	●	●	●		●	●			●			●						—	—	—	—	—	—	—	—	—	●	●	▲	●	●						

Shape	Application Range	Cat. No.	Corner Radius RE
FB (27°)	P	DNMG 150404N-FB	0.4
		150408N-FB	0.8
FA (20°)	P	DNMG 150404N-FA	0.4
		150408N-FA	0.8
FL (10°)	P	DNMG 150404N-FL	0.4
		150408N-FL	0.8
		150412N-FL	1.2
FE (20°)	P	DNMG 150402N-FE	0.2
		150404N-FE	0.4
		150408N-FE	0.8
		150412N-FE	1.2
LU (10°)	P	DNMG 150402N-LU	0.2
		150404N-LU	0.4
		150408N-LU	0.8
		150412N-LU	1.2

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Negative Inserts

DN 55° Diamond type **Negative With Hole**



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

DN■■1504●●

Dimensions (mm)	Cutting Edge Length L	15.5	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

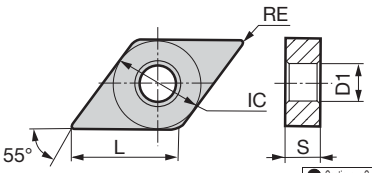
SUMIBORON (CBN) Inserts L54 on
SUMIDIA (PCD) Inserts M12
SUMIDIA BINDERLESS Inserts M28
Ceramic Inserts B128
Applicable External Holders C14 to C16
Applicable Boring Bars E15, E31 to E33

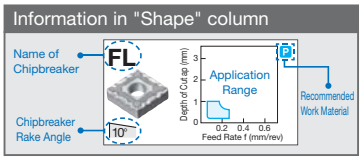
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**SU** 13°		DNMG 150402N-SU	0.2								●	●	●		●						●	●	●		●		●		●	●	▲	●	●								
			150404N-SU	0.4	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●	●		●		●	●	▲	●	●								
			150408N-SU	0.8	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●	●		●		●	●	▲	●	●								
			150412N-SU	1.2	●	●	●		●	●		●	●	●		●						●	●	●		●		●		●	●	▲	●	●								
	SU 13°		DNGG 150402N-SU	0.2																			●	●	●	●					●	▲	●	●								
			150404N-SU	0.4																			●	●	●	●					●	▲	●	●								
			150408N-SU	0.8																			●	●	●	●					●	▲	●	●								
	SE 5°		DNMG 150404N-SE	0.4	●	●	●	●	●	●	●																				●	●		●	●							
			150408N-SE	0.8	●	●	●	●	●	●	●																				●	●		●	●							
			150412N-SE	1.2	●	●	●	●	●	●	●																				●	●		●	●							
			150416N-SE	1.6																																						
	SEW 5° → B131 Wiper		DNMX 150404N-SEW	0.4	●	●	●		●	●																					●	●			●							
			150408N-SEW	0.8	●	●	●		●	●																					●	●			●							
			150412N-SEW	1.2	●	●	●		●	●																																
	EF 20°		DNMG 150404N-EF	0.4	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●		
			150408N-EF	0.8	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●		
			150412N-EF	1.2	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●		
	EF 20°		DNGG 150404N-EF	0.4												●							●	●	●	●	●													●	●		
			150408N-EF	0.8												●							●	●	●	●	●													●	●		
	FY 15°		DNGG 150402R-FY	0.2																							●																
			150402L-FY	0.2																							●																
			150404R-FY	0.4																							●																
			150404L-FY	0.4																							●																
			150408R-FY	0.8																							●																
			150408L-FY	0.8																							●																
	FX 14°		DNGG 150402R-FX	0.2																							●																
			150402L-FX	0.2																							●																
			150404R-FX	0.4																							●																
			150404L-FX	0.4																							●																
			150408R-FX	0.8																							●																
			150408L-FX	0.8																							●																
Light to Medium Cutting	**SX** 3°		DNMG 150404N-SX	0.4	●	●	●	●	●	●	●																				●	●	▲		●							
			150408N-SX	0.8	●	●	●	●	●	●	●																				●	●	▲		●							
			150412N-SX	1.2	●	●	●	●	●	●	●																																
	EX 16°		DNMG 150404N-EX	0.4								●	●	●	▲	●							●	●	●	●	●		●														
			150408N-EX	0.8								●	●	●	▲	●							●	●	●	●	●		●														
			150412N-EX	1.2								●	●	●	▲	●							●	●	●	●	●		●														
	UP 10°		DNMG 150404N-UP	0.4						●	●	●	●	●		●							●	●	●	●	●		●											●			
			150408N-UP	0.8						●	●	●	●	●		●							●	●	●	●	●		●											●			
			150412N-UP	1.2						●	●	●	●	●		●							●	●	●	●	●		●											●			
			150416N-UP	1.6																																						
Medium Cutting	**GU** 7°		DNMG 150404N-GU	0.4	●	●	●	●	●	●	●	●	●	▲	●	●							●	●	●		●		●		●	●			●								
			150408N-GU	0.8	●	●	●	●	●	●	●	●	●	▲	●	●							●	●	●		●		●		●	●			●								
			150412N-GU	1.2	●	●	●	●	●	●	●	●	●	▲	●	●							●	●	●		●		●		●	●			●								
			150416N-GU	1.6			●			●						●																											
	GE 3°		DNMG 150404N-GE	0.4	●	●	●	●	●	●	●																															
			150408N-GE	0.8	●	●	●	●	●	●	●																															
			150412N-GE	1.2	●	●	●	●	●	●	●																															
			150416N-GE	1.6			●																																			

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Negative Inserts

DN 55° Diamond type **Negative With Hole**





Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

DN■■1504●●

Dimensions (mm)	Cutting Edge Length L	15.5	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

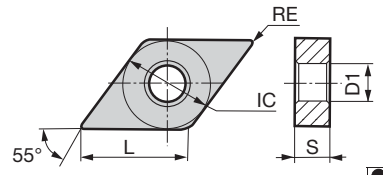
SUMIBORON (CBN) Inserts L54 on | SUMIDIA (PCD) Inserts M12
SUMIDIA BINDERLESS Inserts M28 | Ceramic Inserts B128
Applicable External Holders C14 to C16 | Applicable Boring Bars E15, E31 to E33

					Coated Carbide																			Coated Cermet		Cermet	Cemented Carbide					
					CVD						PVD		CVD					PVD						PVD									
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting	**UX**		DNMG 150404N-UX	0.4	●	●	●	●	●	●	●																													
			150408N-UX	0.8	●	●	●	●	●	●	●																													
			150410N-UX	1.0																																				
			150412N-UX	1.2	●	●	●	●	●	●	●																													
	UG		DNMG 150404N-UG	0.4				●			●																													
			150408N-UG	0.8			●	●		●	●																													
			150412N-UG	1.2			●	●		●	●																													
			150416N-UG	1.6																																				
	EG		DNMG 150404N-EG	0.4	●	●	●	●				●	●	●		●						●	●	●	●	●												●	●	
			150408N-EG	0.8	●	●	●	●				●	●	●		●						●	●	●	●	●												●	●	
			150412N-EG	1.2	●	●	●	●				●	●	●		●						●	●	●	●	●												●	●	
	UM		DNMG 150404R-UM	0.4																										●				●						
			150404L-UM	0.4																										●				●						
			150408R-UM	0.8																										●				●						
			150408L-UM	0.8																										●				●						
	UM		DNGG 150404R-UM	0.4																													●	●	●		●			
			150404L-UM	0.4																													●	●	●		●			
			150408R-UM	0.8																													●	●	●		●			
			150408L-UM	0.8																													●	●			●			
			150412R-UM	1.2																																				
			150412L-UM	1.2																																				
			DNMA 150404	0.4													●	●	●	▲	▲																			
			150408	0.8													●	●	●	▲	▲																			
			150412	1.2													●	●	●	▲	▲																			
			DNGA 150402	0.2																		●																		
			150404	0.4																		●		●	●	●								●				●		
			150408	0.8																		●												●				●		
			150412	1.2																																				
Medium to Roughing	**MU**		DNMG 150408N-MU	0.8	●	●	●	●	●	●	●		●		▲	●						●	●	●	●	●		●										●		
			150412N-MU	1.2	●	●	●	●	●	●	●		●			●						●	●	●	●	●		●										●		
			150416N-MU	1.6			●	●		●	●												●	●	●		●		●										●		
	EM		DNMG 150408N-EM	0.8	●	●	●	●				●	●	●									●	●	●															
			150412N-EM	1.2	●	●	●	●				●	●	●									●	●	●															
			150416N-EM	1.6			●	●				●	●	●									●	●	●															
	ME		DNMG 150408N-ME	0.8	●	●	●	●	●	●	●						●	●																					
			150412N-ME	1.2	●	●	●	●	●	●	●						●	●																					
			150416N-ME	1.6			●										●	●																					
	MX		DNMG 150408N-MX	0.8		●	●	●		●	●																													
			150412N-MX	1.2		●	●	●		●	●																													
			150416N-MX	1.6																																				

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Negative Inserts

DN 55° Diamond type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

DN■■1504●●

Dimensions (mm)	Cutting Edge Length L	15.5	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

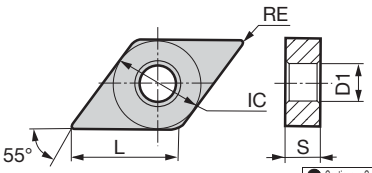
SUMIBORON (CBN) Inserts L54 on
SUMIDIA (PCD) Inserts M12
SUMIDIA BINDERLESS Inserts M28
Ceramic Inserts B128
Applicable External Holders C14 to C16
Applicable Boring Bars E15, E31 to E33

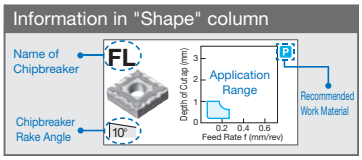
					Corner Radius RE	Coated Carbide																Coated Cermet		Cermet	Cemented Carbide					
						CVD						PVD	CVD				PVD					PVD								
						AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	**UZ**	4°	K	DNMG 150404N-UZ	0.4			●			●							●	●	●	▲	▲																				
				DNMG 150408N-UZ	0.8			●	●		●	●						●	●	●	▲	▲	●	●	●	●	●										●	●	●			
				DNMG 150412N-UZ	1.2			●	●		●	●						●	●	●	▲	▲	●	●	●	●	●												●			
	GZ	0°	K	DNMG 150404N-GZ	0.4						●							●	●	●	▲	▲																				
				DNMG 150408N-GZ	0.8						●							●	●	●	▲	▲																				
				DNMG 150412N-GZ	1.2						●							●	●	●	▲	▲																				
	HM	15°	P M K	DNMG 150404R-HM	0.4	●	●	●	●	●	●	●	●	●	●		●																								
				DNMG 150404L-HM	0.4			●			●		●	●	●		●																									
				DNMG 150408R-HM	0.8	●	●	●	●	●	●	●	●	●	●		●																									
				DNMG 150408L-HM	0.8			●			●		●	●	●		●																									
Roughing	**MP**	0°	P	DNMM 150404N-MP	0.4			●	●		●	●																													
				DNMM 150408N-MP	0.8	●	●	●	●	●	●	●																													
				DNMM 150412N-MP	1.2	●	●	●	●	●	●	●																													
				DNMM 150416N-MP	1.6	●	●	●		●	●																														
Heavy Cutting	**HP**	0°	P	DNMM 150404N-HP	0.4			●	●		●	●																													
				DNMM 150408N-HP	0.8			●	●		●	●																													
				DNMM 150412N-HP	1.2			●	●		●	●																													
				DNMM 150416N-HP	1.6			●			●																														
For Aluminum	**AX**	30°	N	DNGG 150402R-AX	0.2																																			●
				DNGG 150402L-AX	0.2																																			●
				DNGG 150404R-AX	0.4																																			●
				DNGG 150404L-AX	0.4																																			●
				DNGG 150408R-AX	0.8																																			●
				DNGG 150408L-AX	0.8																																			●
Light Cutting of Hardened Steel	**GH**	3°	H	DNGG 150402N-GH	0.2																	●																	
				DNGG 150404N-GH	0.4																	●																	
				DNGG 150408N-GH	0.8																	●																	

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Negative Inserts

DN 55° Diamond type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

DN■■1506●●

Dimensions (mm)	Cutting Edge Length L	15.5	Thickness S	6.35
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞ L60

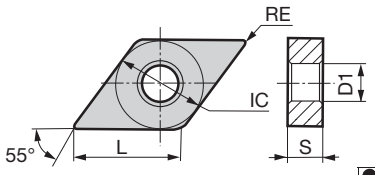
Applicable External Holders ☞ C14, C16 Applicable Boring Bars ☞ E32

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	CVD: AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FB** 27°		DNMG 150604N-FB	0.4										●																●	●	▲	●	●							
			150608N-FB	0.8										●																●	●	▲	●	●							
	FA 20°		DNMG 150604N-FA	0.4																										●	●		●	●							
			150608N-FA	0.8																										●			●	●							
	FE 20°		DNMG 150602N-FE	0.2	●	●	●	●	●		●		●	●																●	●	▲	●	●							
			150604N-FE	0.4	●	●	●	●	●		●		●	●																●	●	▲	●	●							
			150608N-FE	0.8	●	●	●	●	●		●		●	●																●	●	▲	●	●							
			150612N-FE	1.2	●	●	●	●	●		●		●	●																●	●	▲	●	●							
Finishing	**SU** 13°		DNMG 150604N-SU	0.4	●	●	●			●																				●	●		●	●							
			150608N-SU	0.8	●	●	●	●		●	●																			●	●		●	●							
			150612N-SU	1.2	●	●	●	●		●	●																			●	●		●	●							
	SE 5°		DNMG 150604N-SE	0.4																													●								
			150608N-SE	0.8																													●								
			150612N-SE	1.2																																					
			150616N-SE	1.6																																					
	SEW 5° → B131 Wiper		DNMX 150604N-SEW	0.4																																				
			150608N-SEW	0.8																																					
			150612N-SEW	1.2																																					
	EF 20°		DNMG 150604N-EF	0.4	●	●	●	●				●	●	●		●						●	●	●	●	●													●	●	
			150608N-EF	0.8	●	●	●	●				●	●	●		●						●	●	●	●	●													●	●	
			150612N-EF	1.2	●	●	●	●				●	●	●		●						●	●	●	●	●													●	●	
Light to Medium Cutting	**SX** 3°		DNMG 150604N-SX	0.4																										●	●			●							
			150608N-SX	0.8																										●	●			●							
	EX 16°		DNMG 150604N-EX	0.4								●	●	●	▲	●																									
			150608N-EX	0.8								●	●	●	▲	●																									
			150612N-EX	1.2								●	●	●	▲	●																									
	UP 10°		DNMG 150604N-UP	0.4																																					
			150608N-UP	0.8																																					
			150612N-UP	1.2																																					
			150616N-UP	1.6																																					

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Negative Inserts

DN 55° Diamond type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✲ Interrupted Cutting 2nd Recommendation

DN■■1506●●

Dimensions (mm)	Cutting Edge Length L	15.5	Thickness S	6.35
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L60

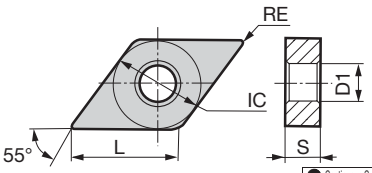
Applicable External Holders C14, C16 — Applicable Boring Bars E32

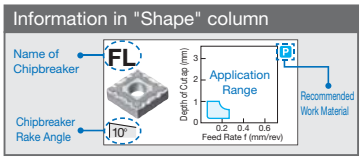
					Coated Carbide																						Coated Cermet			Cermet	Cemented Carbide					
					CVD						PVD		CVD					PVD										PVD									
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting	**GU**		DNMG 150604N-GU	0.4	●	●	●			●	●						●	●																						
	7°		150608N-GU	0.8	●	●	●	●		●	●	●	●	●	▲	●	●	●																						
			150612N-GU	1.2	●	●	●	●		●	●	●	●	●	▲	●	●	●																						
			150616N-GU	1.6			●			●							●	●																						
	GE		DNMG 150604N-GE	0.4	●	●	●	●	●	●	●																												
	3°		150608N-GE	0.8	●	●	●	●	●	●	●																												
			150612N-GE	1.2	●	●	●	●	●	●	●																												
			150616N-GE	1.6	●	●	●	●	●	●	●																												
	UX		DNMG 150604N-UX	0.4	●	●	●	●		●	●																												
	0°		150608N-UX	0.8	●	●	●	●	●	●	●																												
			150610N-UX	1.0																																		
			150612N-UX	1.2	●	●	●	●	●	●	●																												
			150616N-UX	1.6			●			●																													
	UG		DNMG 150604N-UG	0.4			●			●																													
	4°		150608N-UG	0.8			●	●		●	●																												
			150612N-UG	1.2			●			●																													
			150616N-UG	1.6			●			●																													
	EG		DNMG 150604N-EG	0.4	●	●	●	●				●	●	●		●						●	●	●	●	●												●	●
	0°		150608N-EG	0.8	●	●	●	●				●	●	●		●						●	●	●	●	●												●	●
			150612N-EG	1.2	●	●	●	●				●	●	●		●						●	●	●	●	●												●	●
			DNMA 150608	0.8													●	●	●	▲	▲																		
			150612	1.2													●	●	●	▲	▲																		
Medium to Roughing	**MU**		DNMG 150608N-MU	0.8	●	●	●	●	●	●	●		●			●																						
	4°		150612N-MU	1.2	●	●	●	●	●	●	●		●			●																						
			150616N-MU	1.6			●			●																													
	EM		DNMG 150608N-EM	0.8	●	●	●	●				●	●	●								●	●	●														
	0°		150612N-EM	1.2	●	●	●	●				●	●	●								●	●	●														
	ME		DNMG 150608N-ME	0.8	●	●	●	●	●	●	●						●	●																				
	4°		150612N-ME	1.2	●	●	●	●	●	●	●						●	●																				
			150616N-ME	1.6	●	●	●	●	●	●	●						●	●																				
	MX		DNMG 150608N-MX	0.8		●	●			●																												
	-15°		150612N-MX	1.2		●	●			●																												
			150616N-MX	1.6																																		
	UZ		DNMG 150608N-UZ	0.8			●			●							●	●	●	▲	▲																	
	4°		150612N-UZ	1.2			●			●							●	●	●	▲	▲																	

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Negative Inserts

DN 55° Diamond type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

DN■■1506●●

Dimensions (mm)	Cutting Edge Length L	15.5	Thickness S	6.35
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

SUMIBORON (CBN) Inserts ☞L60

Applicable External Holders ☞C14, C16 Applicable Boring Bars ☞E32

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	Coated Carbide (CVD) AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	Cemented Carbide T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	GZ	K	DNMG 150608N-GZ	0.8						●							●●	●●	▲▲	▲▲																							
			150612N-GZ	1.2						●							●●	●●	▲▲	▲▲																							
Roughing	MP	P	DNMM 150604N-MP	0.4			●			●																																	
			150608N-MP	0.8	●	●	●	●	●	●	●																															
			150612N-MP	1.2	●	●	●	●	●	●	●																															
			150616N-MP	1.6	●	●	●		●	●																															
Heavy Cutting	HP	P	DNMM 150604N-HP	0.4			●			●																															
			150608N-HP	0.8			●	●		●	●																															
			150612N-HP	1.2			●	●		●	●																															
			150616N-HP	1.6			●			●																															

DN■■1906●●

Dimensions (mm)	Cutting Edge Length L	19.4	Thickness S	6.35
	Inscribed Circle IC	15.875	Hole Dia. D1	6.35

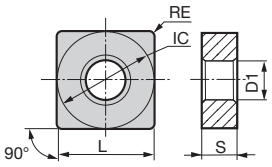
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	Coated Carbide (CVD) AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	Cemented Carbide T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting	UG	P M	DNMG 190608N-UG	0.8																																					
			190612N-UG	1.2																																					
			190616N-UG	1.6																																					
Medium to Roughing	UZ	P M	DNMG 190608N-UZ	0.8																																					
			190612N-UZ	1.2																																					
			190616N-UZ	1.6																																					

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Negative Inserts

SN Square type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

SN■■S702●●

Dimensions (mm)	Cutting Edge Length L	7.14	Thickness S	2.38
	Inscribed Circle IC	7.14	Hole Dia. D1	2.97

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	GX	P M N	SNGG S70204R-GX	0.4																																	●	●					
			S70204L-GX	0.4																																	●	●					
			S70208R-GX	0.8																																	●	●		●			●
			S70208L-GX	0.8																																	●	●		●			●
For Chamfering	C	* Corner radius cannot be selected as the insert is for chamfering.	SNGG S70200-C	(0.8)																																	●	●		●			

SN■■07T2●●

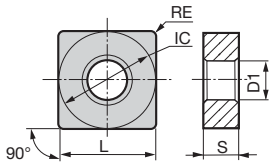
Dimensions (mm)	Cutting Edge Length L	7.94	Thickness S	2.78
	Inscribed Circle IC	7.94	Hole Dia. D1	3.15

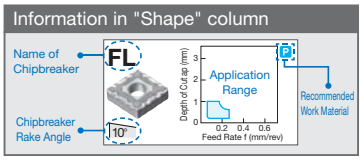
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	GX	P M N	SNGG 07T204R-GX	0.4																																	●					
			07T204L-GX	0.4																																	●	●					
			07T208R-GX	0.8																																	●	●		●			●
			07T208L-GX	0.8																																	●	●		●			●
For Chamfering	C	* Corner radius cannot be selected as the insert is for chamfering.	SNGG 07T200-C	(0.8)																																	●	●		●			

Square type Negative Inserts

SN Square type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SN■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.525	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

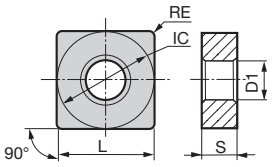
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Applicable External Holders ☞ C22 to C26

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	CVD: AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	**ST**	P	SNGG 090304R-ST	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—												●	●	●	●		●			
	0°		090304L-ST	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—												●	●		●					
			090308R-ST	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—												●	●		●					
			090308L-ST	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—												●	●		●					
	GX	P M N	SNGG 090304R-GX	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																				
	15°		090304L-GX	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																				
			090308R-GX	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																	●		●		
			090308L-GX	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																	●		●		●
Medium Cutting	**GU**	P M	SNMG 090304N-GU	0.4			●			●							●	●				—					—			—	—	—	—	—	—						
	7°		090308N-GU	0.8	●	●	●	●		●	●						●	●				—					—			—	●				●						
	UX	P K	SNMG 090308N-UX	0.8				●			●											—					—			—	—	—	—	—	—						
	0°																																								
	UG	P M	SNMG 090308N-UG	0.8			●	●		●	●											—					—			—	—	—	—	—	—						
	4°																																								
			SNMA 090304	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																			
			090308	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																			
			SNGA 090304	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																	●		●	
			090308	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—																	●		●	
Medium to Roughing	**UZ**	K	SNMG 090312N-UZ	1.2																		—					—			—	—	—	—	—	—						
	4°																																								
For Chamfering	**C**	* Corner radius cannot be selected as the insert is for chamfering.	SNGG 090300-C	(0.8)	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—														●	●		●			
	0°																																								
	SJ	P	SNMG 090304N-SJ	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—													●	—	—	—	—	—	—	—
	0°																																								

Square type Negative Inserts

SN Square type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

SN■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

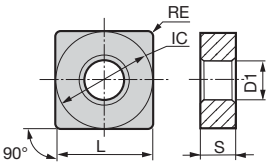
SUMIBORON (CBN) Inserts L69 on
SUMIDIA BINDERLESS Inserts M28
Ceramic Inserts B128
Applicable External Holders C21 to C26
Applicable Boring Bars E39 to E41

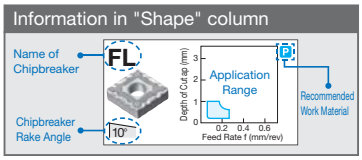
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FB 27°		SNMG 120404N-FB	0.4										●																●	●	▲	●	●								
			120408N-FB	0.8										●																●	●	▲	●	●								
	FL 10°		SNMG 120408N-FL	0.8			●			●						●														●	●	▲		●								
	FE 20°		SNMG 120404N-FE	0.4	●	●	●	●	●		●		●	●																●	●	▲	●	●								
			120408N-FE	0.8	●	●	●	●	●		●		●	●																●	●	▲	●	●								
			120412N-FE	1.2	●	●	●	●	●		●		●	●																●	●	▲	●	●								
Finishing	LU 10°		SNMG 120408N-LU	0.8	●	●	●		●	●			●			●														●	●	▲		●								
			120412N-LU	1.2	●	●	●		●	●			●			●														●	●	▲		●								
	SU 13°		SNMG 120404N-SU	0.4																																						
			120408N-SU	0.8	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●	●		●		●	●	▲	●	●								
	SE 5°		SNMG 120408N-SE	0.8	●	●	●	●	●	●	●																															
			120412N-SE	1.2	●	●	●	●	●	●	●																															
	EF 20°		SNMG 120404N-EF	0.4	●	●	●	●				●	●	●									●	●	●																		
			120408N-EF	0.8	●	●	●	●				●	●	●									●	●	●																		
For Chamfering	SJ 0°		SNMG 120404N-SJ	0.4																															●								
Light Cutting	GX 15°		SNGG 120404R-GX	0.4																																●		●				
			120404L-GX	0.4																																●		●				
			120408R-GX	0.8																																		●				
			120408L-GX	0.8																																●		●				●
			120412R-GX	1.2																																						
			120412L-GX	1.2																																						
Light to Medium Cutting	SX 3°		SNMG 120404N-SX	0.4																																						
			120408N-SX	0.8	●	●	●	●	●	●	●																															
			120412N-SX	1.2	●	●	●	●	●	●	●																															
	EX 16°		SNMG 120404N-EX	0.4								●	●	●	▲	●							●	●	●	●	●		●														
			120408N-EX	0.8								●	●	●	▲	●							●	●	●	●	●		●														
			120412N-EX	1.2								●	●	●	▲	●							●	●	●	●	●		●														

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Negative Inserts

SN Square type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SN■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy, H Hardened Steel

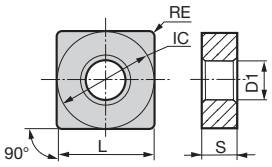
SUMIBORON (CBN) Inserts ☞ L69 on
SUMIDIA BINDERLESS Inserts ☞ M28 Ceramic Inserts ☞ B128
Applicable External Holders ☞ C21 to C26 Applicable Boring Bars ☞ E39 to E41

					Coated Carbide																				Coated Cermet			Cermet	Cemented Carbide						
					CVD						PVD	CVD					PVD								PVD										
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	UP		SNMG 120404N-UP	0.4						●	●	●	●	●		●												●									●			
			120408N-UP	0.8						●	●	●	●	●		●							●	●	●	●		●									●			
			120412N-UP	1.2						●	●	●	●	●		●							●	●	●	●		●									●			
	GU		SNMG 120404N-GU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●	●	●					●	●		●		●		●	●			●						
			120408N-GU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●	●	●					●	●		●		●		●	●			●						
			120412N-GU	1.2	●	●	●	●	●	●	●	●	●	●	▲	●	●	●					●	●		●		●												
			120416N-GU	1.6	●	●	●	●		●	●					●	●																							
	GE		SNMG 120408N-GE	0.8	●	●	●	●	●	●	●																													
			120412N-GE	1.2	●	●	●	●	●	●	●																													
			120416N-GE	1.6	●	●	●	●	●	●	●																													
	UX		SNMG 120404N-UX	0.4				●			●																													
			120408N-UX	0.8	●	●	●	●	●	●	●																													
			120412N-UX	1.2	●	●	●	●	●	●	●																													
			120416N-UX	1.6	●	●	●	●	●	●	●																													
	UG		SNMG 120408N-UG	0.8			●	●		●	●																								●		●			
			120412N-UG	1.2			●	●		●	●																													
			120416N-UG	1.6				●			●																													
	EG		SNMG 120404N-EG	0.4	●	●	●	●				●	●	●									●	●	●													●	●	
			120408N-EG	0.8	●	●	●	●				●	●	●		●							●	●	●	●	●											●	●	
			120412N-EG	1.2	●	●	●	●				●	●	●		●							●	●	●	●	●											●	●	
Medium Cutting	UM		SNMG 120404R-UM	0.4																														●					
			120404L-UM	0.4																														●					
			120408R-UM	0.8																														●					
			120408L-UM	0.8																														●					
			120412R-UM	1.2																														●					
			120412L-UM	1.2																														●					
			120416R-UM	1.6																																			
			120416L-UM	1.6																																			
	UM		SNGG 120404R-UM	0.4																														●	●		●		
			120404L-UM	0.4																														●	●	●	●		
			120408R-UM	0.8																				●	●	●								●	●	●	●	●	●
			120408L-UM	0.8																				●	●	●								●	●	●	●	●	●
			120412R-UM	1.2																														●	●				
			120412L-UM	1.2																																			
			120416R-UM	1.6																																			
			120416L-UM	1.6																																			
			SNMA 120404	0.4													●	●	●	▲	▲																		
			120408	0.8													●	●	●	▲	▲																●		●
			120412	1.2													●	●	●	▲	▲																		
			120416	1.6													●	●	●	▲	▲																		
			120420	2.0													●	●	●	▲	▲																		
			SNGA 120404	0.4																		●															●		
			120408	0.8																		●															●		●
			120412	1.2																														●			●		

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Negative Inserts

SN Square type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

SN■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

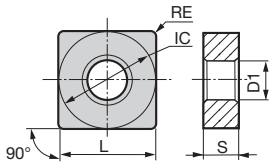
SUMIBORON (CBN) Inserts L69 on
SUMIDIA BINDERLESS Inserts M28
Ceramic Inserts B128
Applicable External Holders C21 to C26
Applicable Boring Bars E39 to E41

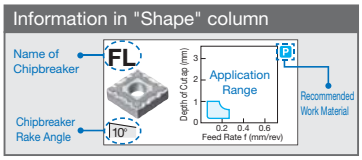
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	CVD AC6020M	AC6030M	PVD AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	MU		SNMG 120408N-MU	0.8	●	●	●	●	●	●	●		●			●							●	●	●	●	●		●														
			120412N-MU	1.2	●	●	●	●	●	●	●		●			●							●	●	●	●	●		●														
			120416N-MU	1.6	●	●	●	●		●	●					●																										
	EM		SNMG 120408N-EM	0.8	●	●	●	●				●	●	●									●	●	●	●																
			120412N-EM	1.2	●	●	●	●				●	●	●									●	●	●	●																
	ME		SNMG 120408N-ME	0.8	●	●	●	●	●	●	●						●	●																							
			120412N-ME	1.2	●	●	●	●	●	●	●						●	●																							
			120416N-ME	1.6	●	●	●	●	●	●	●						●	●																							
	MX		SNMG 120408N-MX	0.8		●	●	●		●	●																														
			120412N-MX	1.2		●	●	●		●	●																														
			120416N-MX	1.6		●	●			●																															
	UZ		SNMG 120408N-UZ	0.8			●	●		●	●						●	●	▲	▲			●	●	●	●	●									●	●	●	●			
			120412N-UZ	1.2			●	●		●	●						●	●	▲	▲			●	●	●	●	●										●	●			
			120416N-UZ	1.6			●	●		●	●						●	●	▲	▲																		●			
	GZ		SNMG 120408N-GZ	0.8						●							●	●	▲	▲																					
			120412N-GZ	1.2						●							●	●	▲	▲																					
			120416N-GZ	1.6						●							●	●	▲	▲																					
	HM		SNMG 120408R-HM	0.8	●	●	●	●	●	●	●	●	●	●		●																									
			120408L-HM	0.8	●	●	●	●	●	●	●	●	●	●		●																									
	MM		SNGG 120408R-MM	0.8																																					
			120408L-MM	0.8																																					
Roughing	MP		SNMM 120408N-MP	0.8	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●															
			120412N-MP	1.2	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●															
			120416N-MP	1.6	●	●	●	●	●	●	●		●			●							●	●	●	●															
			120420N-MP	2.0			●			●																															
Heavy Cutting	HG		SNMM 120408N-HG	0.8	●	●	●	●	●	●	●					●																									
			120412N-HG	1.2	●	●	●	●	●	●	●					●																									
			120416N-HG	1.6	●	●	●	●	●	●	●					●																									
	HP		SNMM 120408N-HP	0.8			●	●		●	●					●																									
			120412N-HP	1.2			●	●		●	●					●																									
			120416N-HP	1.6			●	●		●	●					●																									
For Chamfering	C	* Corner radius cannot be selected as the insert is for chamfering.	SNGG 120400-C	(0.8)																																●		●			●

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Negative Inserts

SN Square type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SN■■1204●●

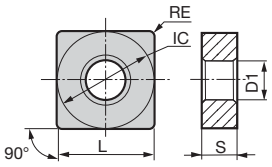
Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application

| | | |

Square type Negative Inserts

SN Square type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

SN■■1506●●

Dimensions (mm)	Cutting Edge Length L	15.875	Thickness S	6.35
	Inscribed Circle IC	15.875	Hole Dia. D1	6.35

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

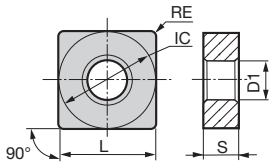
Applicable External Holders C21 to C24

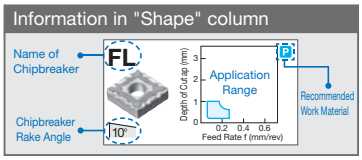
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	EX 16°	(ap) 4 2 0 0.2 0.4 (f) M S	SNMG 150612N-EX	1.2																			●	●	●	●	●																
Medium Cutting	GU 7°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	SNMG 150608N-GU	0.8	●	●	●	●	●	●	●	●	●				●	●																									
			150612N-GU	1.2	●	●	●	●	●	●	●	●	●				●	●																									
			150616N-GU	1.6	●	●	●	●	●	●	●	●	●				●	●																									
	GE 3°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P	SNMG 150608N-GE	0.8	●	●	●	●	●	●	●																															
			150612N-GE	1.2	●	●	●	●	●	●	●																															
			150616N-GE	1.6	●	●	●	●	●	●	●																															
	UG 4°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M	SNMG 150612N-UG	1.2				●			●																															
	EG 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f)	SNMG 150608N-EG	0.8	●	●	●	●				●	●	●									●	●	●	●	●																
			150612N-EG	1.2	●	●	●	●				●	●	●		●						●	●	●	●	●															●	●
			150616N-EG	1.6	●	●	●	●				●	●	●								●	●	●	●	●																
			SNMA 150612	1.2													●	●	●	▲	▲																					
			150616	1.6													●	●	●	▲	▲																					
Medium to Roughing	MU 4°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P M S	SNMG 150608N-MU	0.8	●	●	●	●	●	●	●												●	●	●	●	●																
			150612N-MU	1.2	●	●	●	●	●	●	●	●				●						●	●	●	●	●																
			150616N-MU	1.6	●	●	●	●	●	●	●	●				●						●	●	●	●	●																
	EM 0°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) M S	SNMG 150608N-EM	0.8	●	●	●	●				●	●	●									●	●	●																	
			150612N-EM	1.2	●	●	●	●				●	●	●									●	●	●																	
			150616N-EM	1.6	●	●	●	●				●	●	●									●	●	●																	
	ME 4°	(ap) 8 6 4 2 0 0.4 0.8 (f) P	SNMG 150608N-ME	0.8	●	●	●	●	●	●	●						●	●																								
			150612N-ME	1.2	●	●	●	●	●	●	●						●	●																								
			150616N-ME	1.6	●	●	●	●	●	●	●						●	●																								
	MX -15°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P	SNMG 150612N-MX	1.2		●	●			●																															
			150616N-MX	1.6		●	●			●																															
	UZ 4°	(ap) 6 4 2 0 0.2 0.4 0.6 (f) P	SNMG 150612N-UZ	1.2			●	●			●	●																													
			150616N-UZ	1.6			●	●			●	●																													
	GZ 0°	(ap) 10 5 0 0.5 1.0 (f) K	SNMG 150612N-GZ	1.2													●	●	●	▲	▲																					
			150616N-GZ	1.6													●	●	●	▲	▲																					

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Negative Inserts

SN Square type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✲ Interrupted Cutting 2nd Recommendation

SN■■1506●●

Dimensions (mm)	Cutting Edge Length L	15.875	Thickness S	6.35
	Inscribed Circle IC	15.875	Hole Dia. D1	6.35

Recommended Application

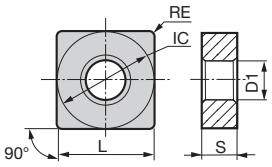
P	Steel	● ◔ ● ✱ ○ ◔ ✲
M	Stainless Steel	✲ ✲ ● ● ✱ ○ ◔
K	Cast Iron	✲ ✲ ● ● ✱ ○ ◔
N	Non-Ferrous Metal	●
S	Exotic Alloy	● ● ✱ ◔ ✲ ✲
H	Hardened Steel	●

Applicable External Holders ☞ C21 to C24

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	CVD: AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	**HM**	P M K	**SNMG 150608R-HM**	0.8								●	●	●																											
			150608L-HM	0.8								●	●	●																											
Heavy Cutting	**MP**	P M	**SNMM 150612N-MP**	1.2	●	●	●		●	●			●																											
			150616N-MP	1.6	●	●	●		●	●			●																											
	HG	P	**SNMM 150616N-HG**	1.6	●	●	●		●	●																														

Square type Negative Inserts

SN Square type Negative With Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SN■■1906●●

Dimensions (mm)	Cutting Edge Length L	19.05	Thickness S	6.35
	Inscribed Circle IC	19.05	Hole Dia. D1	7.94

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

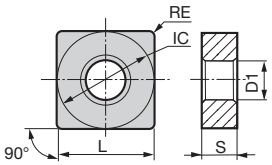
Applicable External Holders ☞ C21 to C24 Applicable Boring Bars ☞ E39, E40

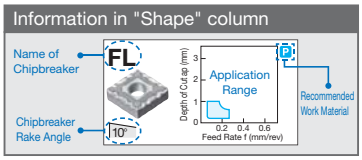
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	**EX**		SNMG 190612N-EX	1.2																			●	●	●	●	●																
Medium Cutting	**UX**		SNMG 190612N-UX	1.2	●	●	●	●	●	●	●																																
			190616N-UX	1.6	●	●	●	●	●	●	●																																
	UG		SNMG 190612N-UG	1.2				●			●																																
			190616N-UG	1.6				●			●																																
	EG		SNMG 190612N-EG	1.2	●	●	●	●				●	●	●		●							●	●	●	●	●														●	●	
			190616N-EG	1.6	●	●	●	●				●	●	●		●							●	●	●	●	●														●	●	
			SNMA 190612	1.2													●	●	●	▲	▲																					
			190616	1.6													●	●	●	▲	▲																					
Medium to Roughing	**MU**		SNMG 190612N-MU	1.2	●	●	●	●	●	●	●		●			●							●	●	●	●	●																
			190616N-MU	1.6	●	●	●	●	●	●	●		●			●							●	●	●	●	●																
			190624N-MU	2.4	●	●	●	●	●	●	●												●	●	●	●	●																
	EM		SNMG 190612N-EM	1.2	●	●	●	●				●	●	●									●	●	●																		
			190616N-EM	1.6	●	●	●	●				●	●	●									●	●	●																		
			190624N-EM	2.4	●	●	●	●				●	●	●									●	●	●																		
	ME		SNMG 190612N-ME	1.2	●	●	●	●	●	●	●						●	●																								
			190616N-ME	1.6	●	●	●	●	●	●	●						●	●																								
			190624N-ME	2.4	●	●	●	●	●	●	●						●	●																								
	MX		SNMG 190612N-MX	1.2		●	●	●		●	●																																
			190616N-MX	1.6		●	●	●		●	●																																
	UZ		SNMG 190608N-UZ	0.8																																		●				
			190612N-UZ	1.2			●	●		●	●						●	●	●	▲	▲																					
			190616N-UZ	1.6			●	●		●	●						●	●	●	▲	▲																					
	GZ		SNMG 190612N-GZ	1.2													●	●	●	▲	▲																					
			190616N-GZ	1.6													●	●	●	▲	▲																					
Heavy Cutting	**MP**		SNMM 190612N-MP	1.2	●	●	●	●	●	●	●	●	●			●							●	●	●	●																
			190616N-MP	1.6	●	●	●	●	●	●	●	●	●			●							●	●	●	●																

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Negative Inserts

SN Square type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✲ Interrupted Cutting 2nd Recommendation

SN■■1906●●

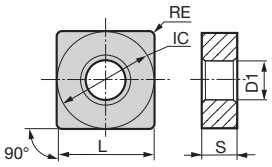
Dimensions (mm)	Cutting Edge Length L	19.05	Thickness S	6.35
	Inscribed Circle IC	19.05	Hole Dia. D1	7.94

Recommended Application

P	Steel	● ◔ ● ✱ ○ ◔ ✲ ✲ ◔ ● ● ✱ ○ ◔ ✲ ✲ ✲

Square type Negative Inserts

SN Square type Negative With Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SN■■2507●●

Dimensions (mm)	Cutting Edge Length L	25.4	Thickness S	7.94
	Inscribed Circle IC	25.4	Hole Dia. D1	9.12

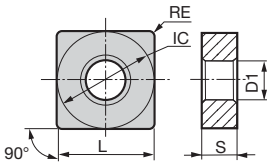
Recommended Application

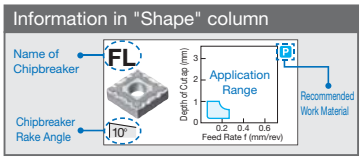
		Coated Carbide																				Coated Cermet		Cermet	Cemented Carbide						
		CVD								PVD		CVD					PVD					PVD										
	Shape	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC5003U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Application Range		P	P	P	P	P	P	P					P																									
Corner Radius RE		2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Medium Cutting	UG	SNMG 250724N-UG																																					
Heavy Cutting	MP	SNMM 250724N-MP	●	●	●	●	●	●	●		●		●																									
	HP	SNMM 250724N-HP	●	●	●	●	●	●	●				●																									
	HU	SNMM 250724N-HU	●	●	●		●	●					●																									
	HW	SNMM 250724N-HW	●	●	●		●	●					●																									
	HF	SNMM 250724N-HF 250732N-HF			● ● ● ●	●		● ● ● ●	● ● ● ●				●																									

Applicable External Holders ☞ C21, C22, C24

Square type Negative Inserts

SN Square type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✲ Interrupted Cutting 2nd Recommendation

SN■■2509●●

Dimensions (mm)	Cutting Edge Length L	25.4	Thickness S	9.52
	Inscribed Circle IC	25.4	Hole Dia. D1	9.12

Recommended Application

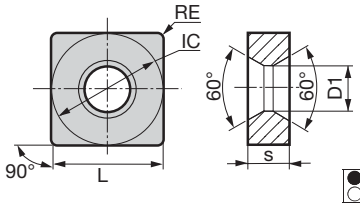
P	Steel	● ◔ ● ✱ ○ ◔ ✲ ✲ ◔ ● ✱ ○ ◔ ◔ ● ● ✱ ○ ◔ ✲ ✲ ✲ ● ✱ ✲ ● ✱ ✲
M	Stainless Steel	✱ ✲ ✲ ● ✱ ✲ ✲ ● ✱ ○ ◔ ✲ ✲ ● ✱ ✲ ✲ ● ✱ ✲
K	Cast Iron	✲ ✲ ✲ ✲ ✲ ● ● ✱ ○ ◔ ✲ ✲ ● ✱ ✲ ●
N	Non-Ferrous Metal	●
S	Exotic Alloy	● ● ✱ ○ ◔ ✲ ✲
H	Hardened Steel	●

Applicable External Holders ☞ C21, C22

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	CVD: AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting	UG 4°	0.2 0.4 0.6	SNMG 250924N-UG	2.4				●			●											—																			
Medium to Roughing	MU 4°	0.2 0.4 0.6	SNMG 250924N-MU	2.4	●	●	●	●	●	●	●											—	●	●	●	●	●														
	EM 0°	0.5 1.0	SNMG 250924N-EM	2.4	●	●	●	●						●	●							—	●	●	●																
	ME 4°	0.4 0.8	SNMG 250924N-ME	2.4	●	●	●	●	●	●	●						●	●				—																			
	UZ 4°	0.2 0.4 0.6	SNMG 250924N-UZ	2.4																		—																			
Heavy Cutting	MP 0°	0.5 1.0 1.5	SNMM 250924N-MP	2.4	●	●	●		●	●			●			●						—																			
	HP 0°	0.5 1.0 1.5	SNMM 250924N-HP	2.4	●	●	●		●	●						●						—																			
	HU -15°	0.5 1.0 1.5	SNMM 250924N-HU	2.4	●	●	●		●	●						●						—																			
	HW -15°	0.5 1.0 1.5	SNMM 250924N-HW	2.4	●	●	●		●	●						●						—																			
	HF -15°	0.5 1.0 1.5	SNMM 250924N-HF	2.4			●	●		●	●					●						—																			
			250932N-HF	3.2			●	●		●	●											—																			

Square type Negative Inserts

SN Square type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

SN■■3109●●

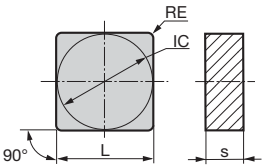
Dimensions (mm)	Cutting Edge Length L	31.75	Thickness S	9.52
	Inscribed Circle IC	31.75	Hole Dia. D1	8.8

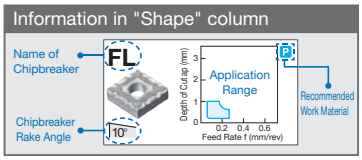
Recommended Application

		Coated Carbide																						Coated Cermet			Cermet	Cemented Carbide								
		CVD							PVD		CVD						PVD								PVD												
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Heavy Cutting	**MP**	(ap) 15 10 5 0 0.5 1.0 1.5 (f) P	**SNMM 310924N-MP**	2.4	●	●	●		●	●			●			●						—	—	—	—	—	—	—	—	—	—	—	—	—			●				—
	HP	(ap) 15 10 5 0 0.5 1.0 1.5 (f) P	**SNMM 310924N-HP**	2.4	●	●	●		●	●						●						—	—	—	—	—	—	—	—	—	—	—	—	—							—
	HU	(ap) 30 20 10 0 0.5 1.0 1.5 (f) P	**SNMM 310924N-HU**	2.4	●	●	●		●	●						●						—	—	—	—	—	—	—	—	—	—	—	—	—							—
	HW	(ap) 30 20 10 0 0.5 1.0 1.5 (f) P	**SNMM 310924N-HW**	2.4	●	●	●		●	●						●						—	—	—	—	—	—	—	—	—	—	—	—	—							—
	HF	(ap) 30 20 10 0 0.5 1.0 1.5 (f) P	**SNMM 310924N-HF**	2.4			●	●		●	●											—	—	—	—	—	—	—	—	—	—	—	—	—							—

Square type Negative Inserts

SN Square type Negative Without Hole



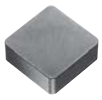


● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

SN■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.525	Thickness S	3.18
	Inscribed Circle IC	9.525		

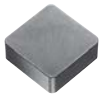
SUMIBORON (CBN) Inserts ☞L72, L73 Applicable External Holders ☞L122

	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			SNGN 090304	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			090308	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			090312	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

SN■■1203●●

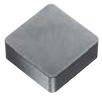
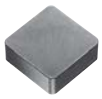
Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	3.18
	Inscribed Circle IC	12.7		

SUMIBORON (CBN) Inserts ☞L74 Applicable External Holders ☞L122

	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			SNGN 120304	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			120308	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			120312	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

SN■■1204●●

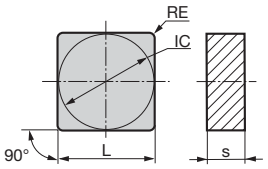
Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	4.76
	Inscribed Circle IC	12.7		

	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			SNMN 120404	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	—	—	●	●	●	●	●	●	—	—
			120408	0.8	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●	▲	▲	—	●	●	●	●	—	—	—	—	—	—	—	—	●	●	●	●	●	●	—	—
			120412	1.2	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●	▲	▲	—	●	●	●	●	—	—	—	●	—	—	—	—	●	●	●	●	●	●	—	—
			120416	1.6	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●	▲	▲	—	●	●	●	●	—	—	—	●	—	—	—	—	●	●	●	●	●	●	—	—
			120420	2.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—
			120424	2.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—
			SNGN 120404	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	—	—	●	—	—	—
			120408	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	—	—	●	—	—	—
			120412	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			120416	1.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Negative Inserts

SN Square type Negative Without Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

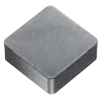
● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SN■■1207●●

Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	7.94
	Inscribed Circle IC	12.7		

Ceramic Inserts ☞ B128

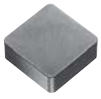
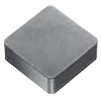
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			**SNGN 120708**	0.8																																						
			120712	1.2																																							
			120716	1.6																																							
			120720	2.0																																							

SN■■1504●●

Dimensions (mm)	Cutting Edge Length L	15.875	Thickness S	4.76
	Inscribed Circle IC	15.875		

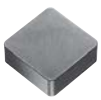
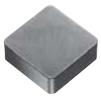
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			**SNMN 150408**	0.8																															●			●				
			150412	1.2																																							
			**SNGN 150408**	0.8																																						
			150412	1.2																																							
			150416	1.6																																							

SN■■1904●●

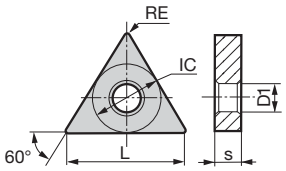
Dimensions (mm)	Cutting Edge Length L	19.05	Thickness S	4.76
	Inscribed Circle IC	19.05		

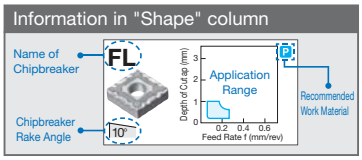
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			**SNMN 190412**	1.2																																		●	●				
			**SNGN 190402**	0.2																																						
			190404	0.4																																							
			190408	0.8																																							
			190412	1.2																																							
			190416	1.6																																							

Triangular type Negative Inserts

TN Triangular type Negative With Hole

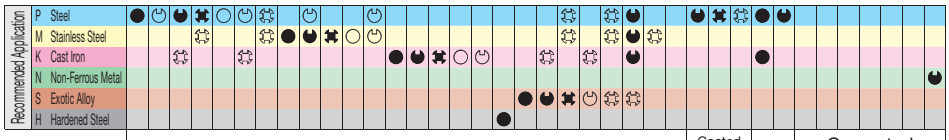




● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TN■■0902●●

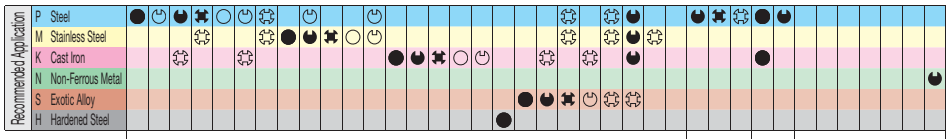
Dimensions (mm)	Cutting Edge Length L	9.6	Thickness S	2.38
	Inscribed Circle IC	5.56	Hole Dia. D1	2.57



	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide PVD AC6040M	Coated Carbide CVD AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	Coated Cermet PVD ACZ150	T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	GX		TNGG 090204R-GX	0.4																																	●		●			●
			090204L-GX	0.4																																	●		●			●
			090208R-GX	0.8																																	●		●			●
			090208L-GX	0.8																																	●		●			●

TN■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	2.26

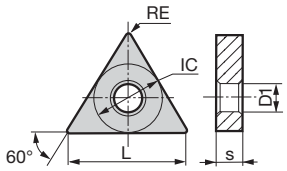


Applicable External Holders ☞ C32 to C34

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide PVD AC6040M	Coated Carbide CVD AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	Coated Cermet PVD ACZ150	T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FT		TNGG 110302R-FT	0.2																															●	●	●						
			110302L-FT	0.2																															●	●							
			110304R-FT	0.4																															●	●	●	●					
			110304L-FT	0.4																															●	●							
			110308R-FT	0.8																																							
			110308L-FT	0.8																																							
Light Cutting	GX		TNGG 110302R-GX	0.2																																			●				
			110302L-GX	0.2																																			●				
			110304R-GX	0.4																																			●				
			110304L-GX	0.4																																			●				
			110308R-GX	0.8																																							
			110308L-GX	0.8																																							
Medium Cutting			TNMA 110304	0.4																																							
			110308	0.8																																							
			TNGA 110302	0.2																																			●				
			110304	0.4																																			●				
			110308	0.8																																			●				

Triangular type Negative Inserts

TN Triangular type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TN■■11T2●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	2.78
	Inscribed Circle IC	6.35	Hole Dia. D1	2.76

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	Coated Carbide (PVD) AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AZ150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	GX		TNGG 11T204R-GX	0.4																																		●		●			
			11T204L-GX	0.4																																	●		●			●
			11T208R-GX	0.8																																		●		●			
			11T208L-GX	0.8																																	●		●			●
Medium Cutting			TNGA 11T204	0.4																																							●

TN■■1303●●

Dimensions (mm)	Cutting Edge Length L	13.7	Thickness S	3.18
	Inscribed Circle IC	7.94	Hole Dia. D1	3.15

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	Coated Carbide (PVD) AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AZ150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	GX		TNGG 130304R-GX	0.4																																		●		●			
			130304L-GX	0.4																																	●		●			●
			130308R-GX	0.8																																	●		●			
			130308L-GX	0.8																																	●		●			●

TN■■1603●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

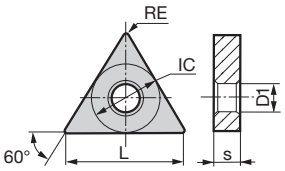
Applicable External Holders C32 to C34

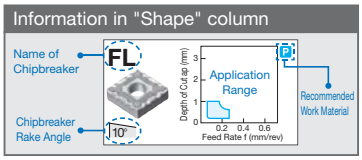
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	Coated Carbide (PVD) AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AZ150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	ST		TNGG 160302R-ST	0.2																															●	●							
			160302L-ST	0.2																															●	●							
			160304R-ST	0.4																															●	●		●					
			160304L-ST	0.4																															●	●	●						
			160308R-ST	0.8																															●	●							
			160308L-ST	0.8																															●	●							
Light to Medium Cutting	SX		TNMG 160304N-SX	0.4	●	●	●			●																																	
			160308N-SX	0.8	●	●	●	●		●	●																																	

Triangular type Negative Inserts

TN Triangular type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TN■■1603●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Applicable External Holders ☞ C32 to C34

Recommended Application		Coated Carbide																						Coated Cermet			Cermet	Cemented Carbide						
		CVD								PVD	CVD						PVD							PVD										
		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
P	Steel	●	◔	●	✖	○	◔	✖			●	✖	○	◔						✖	✖	✖	✖	✖				●	✖	✖	●	●							
M	Stainless Steel			✖			✖		●	●	✖	○	◔							✖	✖	✖	✖	✖		●												
K	Cast Iron		✖			✖			●	●	✖	○	◔	●	●	✖	○	◔						✖	✖	●					●							
N	Non-Ferrous Metal																																				●
S	Exotic Alloy																		●	●	●	✖	◔	✖	✖												
H	Hardened Steel																	●																			

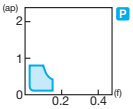
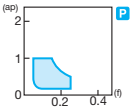
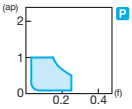
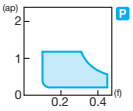
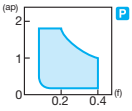
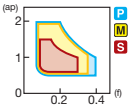
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			TNMA 160304	0.4																																				
			160308	0.8																																				
			160312	1.2																																				
			TNGA 160302	0.2																																				
			160304	0.4																																		●		●
			160308	0.8																																		●		
			160312	1.2																																				

TN■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

SUMIBORON (CBN) Inserts ☞ L80 on　SUMIDIA (PCD) Inserts ☞ M16
Ceramic Inserts ☞ B128
Applicable External Holders ☞ C29 to C35, D16, D20　Applicable Boring Bars ☞ E15, E47 to E49

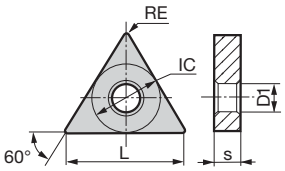
Recommended Application		Coated Carbide																						Coated Cermet			Cermet	Cemented Carbide						
		CVD								PVD	CVD						PVD							PVD										
		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
P	Steel	●	◔	●	✖	○	◔	✖			●	✖	○	◔						✖	✖	✖	✖	✖				●	✖	✖	●	●							
M	Stainless Steel			✖			✖		●	●	✖	○	◔							✖	✖	✖	✖	✖		●												
K	Cast Iron		✖			✖			●	●	✖	○	◔	●	●	✖	○	◔						✖	✖	●					●							
N	Non-Ferrous Metal																																				●
S	Exotic Alloy																		●	●	●	✖	◔	✖	✖												
H	Hardened Steel																	●																			

	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FB** 27°		TNMG 160402N-FB	0.2										●															●	●	▲	●	●							
			160404N-FB	0.4										●															●	●	▲	●	●							
			160408N-FB	0.8										●															●	●	▲	●	●							
	FA 20°		TNMG 160402N-FA	0.2																									●	●	▲	●	●							
			160404N-FA	0.4																									●	●	▲	●	●							
			160408N-FA	0.8																									●	●	▲	●	●							
			160412N-FA	1.2																																				
	FL 10°		TNMG 160404N-FL	0.4			●			●						●														●	●	▲	●	●							
			160408N-FL	0.8			●			●						●														●	●	▲	●	●							
	FE 20°		TNMG 160402N-FE	0.2	●	●	●	●	●		●		●	●																●	●	▲	●	●							
			160404N-FE	0.4	●	●	●	●	●		●		●	●																●	●	▲	●	●							
			160408N-FE	0.8	●	●	●	●	●		●		●	●																●	●	▲	●	●							
			160412N-FE	1.2	●	●	●	●	●		●		●	●																●	●	▲	●	●							
Finishing	**LU** 10°		TNMG 160402N-LU	0.2									●			●														●	●	▲	●	●							
			160404N-LU	0.4	●	●	●	●	●	●	●		●			●														●	●	▲	●	●							
			160408N-LU	0.8	●	●	●	●	●	●	●		●			●														●	●	▲	●	●							
			160412N-LU	1.2	●	●	●	●	●	●	●		●			●														●	●	▲		●							
	SU 13°		TNMG 160402N-SU	0.2								●	●	●		●					●	●	●		●		●			●	●	▲	●	●							
			160404N-SU	0.4	●	●	●	●	●	●	●	●	●	●		●					●	●	●	●	●		●			●	●	▲	●	●							
			160408N-SU	0.8	●	●	●	●	●	●	●	●	●	●		●					●	●	●	●	●		●			●	●	▲	●	●							
			160412N-SU	1.2	●	●	●		●	●		●	●	●		●					●	●	●	●	●		●			●	●	▲	●	●							

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Negative Inserts

TN Triangular type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TN■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

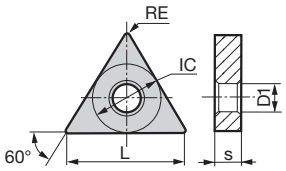
SUMIBORON (CBN) Inserts L80 on
SUMIDIA (PCD) Inserts M16
Ceramic Inserts B128
Applicable External Holders C29 to C35, D16, D20
Applicable Boring Bars E15, E47 to E49

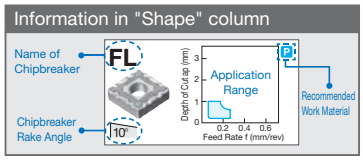
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	CVD AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**SU**		TNGG 160402N-SU	0.2																			●	●	●	●	●				●	●	▲	●	●							
	13°		160404N-SU	0.4																			●	●	●	●	●				●	●	▲	●	●							
			160408N-SU	0.8																			●	●	●	●	●				●	●	▲	●	●							
	SE		TNMG 160404N-SE	0.4	●	●	●	●	●	●	●																				●	●		●	●							
	5°		160408N-SE	0.8	●	●	●	●	●	●	●																				●	●		●	●							
			160412N-SE	1.2	●	●	●	●	●	●	●																															
	EF		TNMG 160404N-EF	0.4	●	●	●	●				●	●	●		●							●	●	●	●	●														●	●	
	20°		160408N-EF	0.8	●	●	●	●				●	●	●		●							●	●	●	●	●														●	●	
	FY		TNGG 160401R-FY	0.1																											●			●	●							
			160401L-FY	0.1																											●			●	●							
			160402R-FY	0.2																			●	●			●	●	●	●	●	●	▲	●	●							
			160402L-FY	0.2																			●	●			●	●	●	●	●	●	▲	●	●							
			160404R-FY	0.4																			●	●			●	●	●	●	●	●	▲	●	●							
			160404L-FY	0.4																			●	●			●	●	●	●	●	●	▲	●	●							
			160408R-FY	0.8																									●	●	●			●	●							
			160408L-FY	0.8																									●	●	●			●	●							
			160412R-FY	1.2																											●				●							
	15°		160412L-FY	1.2																											●				●							
	FX		TNGG 160402R-FX	0.2																			●	●			●	●	●	●	●	●	▲	●	●							
			160402L-FX	0.2																			●	●			●	●	●	●	●	●	▲	●	●							
			160404R-FX	0.4																			●	●			●	●	●	●	●	●	▲	●	●							
			160404L-FX	0.4																			●	●			●	●	●	●	●	●	▲	●	●							
			160408R-FX	0.8																									●													
			160408L-FX	0.8																									●													
	14°																																									
Light Cutting	**ST**		TNGG 160402R-ST	0.2																														●	●							
			160402L-ST	0.2																														●	●							
			160404R-ST	0.4																														●	●							
			160404L-ST	0.4																														●	●							
			160408R-ST	0.8																														●	●							
			160408L-ST	0.8																														●	●							
			160412R-ST	1.2																															●							
	0°		160412L-ST	1.2																															●							
	GX		TNGG 160404R-GX	0.4																																●		●				
			160404L-GX	0.4																																		●				●
			160408R-GX	0.8																																		●				
			160408L-GX	0.8																																●		●				●
			160412R-GX	1.2																																						
	15°		160412L-GX	1.2																																						
Light to Medium Cutting	**SX**		TNMG 160404N-SX	0.4	●	●	●	●	●	●	●																				●	●	▲		●							
	3°		160408N-SX	0.8	●	●	●	●	●	●	●																				●	●	▲		●							
			160412N-SX	1.2																																						
			160416N-SX	1.6																																						

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Negative Inserts

TN Triangular type Negative With Hole





Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TN■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

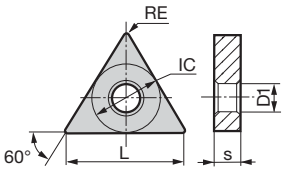
SUMIBORON (CBN) Inserts L80 on | SUMIDIA (PCD) Inserts M16 | Ceramic Inserts B128
Applicable External Holders C29 to C35, D16, D20 | Applicable Boring Bars E15, E47 to E49

					Coated Carbide																										Coated Cermet			Cermet	Cemented Carbide				
					CVD							PVD	CVD					PVD													PVD								
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	**EX**		TNMG 160404N-EX	0.4								●	●	●	▲	●						●	●	●	●	●		●													
	16°		160408N-EX	0.8								●	●	●	▲	●						●	●	●	●	●		●													
			160412N-EX	1.2								●	●	●	▲	●						●	●	●	●	●		●													
	UP		TNMG 160404N-UP	0.4						●	●	●	●	●		●						●	●	●	●	●		●										●			
	10°		160408N-UP	0.8						●	●	●	●	●		●						●	●	●	●	●		●										●			
			160412N-UP	1.2						●		●	●	●		●						●	●	●	●	●		●													
Medium Cutting	**GU**		TNMG 160404N-GU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●	●	●				●	●	●		●		●		●	●			●							
	7°		160408N-GU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●	●	●				●	●	●		●		●		●	●			●							
			160412N-GU	1.2	●	●	●	●	●	●	●	●	●	●	▲	●	●	●				●	●	●		●		●													
			160416N-GU	1.6	●	●	●	●		●	●						●	●																							
	GE		TNMG 160404N-GE	0.4	●	●	●	●	●	●	●																														
	3°		160408N-GE	0.8	●	●	●	●	●	●	●																														
			160412N-GE	1.2	●	●	●	●	●	●	●																														
	UX		TNMG 160404N-UX	0.4	●	●	●	●	●	●	●																														
	0°		160408N-UX	0.8	●	●	●	●	●	●	●																														
			160412N-UX	1.2	●	●	●	●	●	●	●																														
	UG		TNMG 160404N-UG	0.4			●	●		●	●																								●						
	4°		160408N-UG	0.8			●	●		●	●																										●				
			160412N-UG	1.2			●	●		●	●																														
			160416N-UG	1.6			●	●		●	●																														
	EG		TNMG 160404N-EG	0.4	●	●	●	●				●	●	●								●	●	●															●	●	
	0°		160408N-EG	0.8	●	●	●	●				●	●	●		●						●	●	●	●	●													●	●	
			160412N-EG	1.2	●	●	●	●				●	●	●		●						●	●	●	●	●													●	●	
	UM		TNMG 160404R-UM	0.4																										●	●	▲	●	●						
	0°		160404L-UM	0.4																										●	●	▲	●	●						
			160408R-UM	0.8																										●	●	▲	●	●						
			160408L-UM	0.8																										●	●	▲	●	●						
	UM		TNGG 160402R-UM	0.2																										●	●	▲	●	●	●	●		●		
			160402L-UM	0.2																										●	●	▲	●	●		●		●		
			160404R-UM	0.4																										●	●	▲	●	●	●	●	●	●		●
			160404L-UM	0.4																										●	●	▲	●	●	●	●	●	●		●
			160408R-UM	0.8																										●	●	▲	●	●	●	●	●	●		●
			160408L-UM	0.8																										●	●	▲	●	●	●	●	●	●		●
			160412R-UM	1.2																													●	●		●				
			160412L-UM	1.2																													●	●						
			160416R-UM	1.6																																				
			160416L-UM	1.6																																				
			TNMA 160404	0.4													●	●	●	▲	▲		●	●	●	●													●		
			160408	0.8													●	●	●	▲	▲		●	●	●	●													●		●
			160412	1.2													●	●	●	▲	▲																		●		
			160416	1.6													●	●	●	▲	▲																				
			160420	2.0													●	●	●	▲	▲																				

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Negative Inserts

TN Triangular type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TN■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

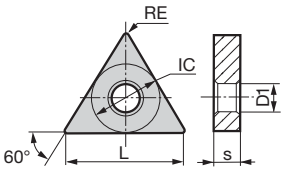
SUMIBORON (CBN) Inserts L80 on
SUMIDIA (PCD) Inserts M16
Ceramic Inserts B128
Applicable External Holders C29 to C35, D16, D20
Applicable Boring Bars E15, E47 to E49

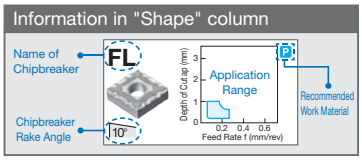
				Corner Radius RE	Coated Carbide																						Coated Cermet			Cermet	Cemented Carbide					
					CVD								PVD		CVD				PVD								PVD									
	Shape	Application Range	Cat. No.		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			TNGA 160402	0.2																	●																			
			160404	0.4																	●		●	●	●								●					●		●
			160408	0.8																	●												●	●				●		●
			160412	1.2																																		●		
			160416	1.6																																				
Medium to Roughing	MU 4°	P M S	TNMG 160408N-MU	0.8	●	●	●	●	●	●	●		●			●						●	●	●	●	●		●												
			160412N-MU	1.2	●	●	●	●	●	●	●		●			●						●	●	●	●	●		●												
	EM 0°	M S	TNMG 160408N-EM	0.8	●	●	●	●				●	●	●								●	●	●																
			160412N-EM	1.2	●	●	●	●				●	●	●								●	●	●																
	ME 4°	P	TNMG 160408N-ME	0.8	●	●	●	●	●	●	●						●	●																					
			160412N-ME	1.2	●	●	●	●	●	●	●						●	●																					
	MX -15°	P	TNMG 160408N-MX	0.8		●	●	●		●	●																												
			160412N-MX	1.2		●	●	●		●	●																												
	UZ 4°	K	TNMG 160404N-UZ	0.4			●			●							●	●	●	▲	▲																●			
			160408N-UZ	0.8			●	●		●	●						●	●	●	▲	▲																		
			160412N-UZ	1.2			●	●		●	●						●	●	●	▲	▲																		
			160416N-UZ	1.6			●			●							●	●	●	▲	▲																		
			160420N-UZ	2.0			●			●							●	●	●	▲	▲																		
	GZ 0°	K	TNMG 160404N-GZ	0.4						●							●	●	●	▲	▲																		
			160408N-GZ	0.8						●							●	●	●	▲	▲																		
			160412N-GZ	1.2						●							●	●	●	▲	▲																		
	HM 15°	P M K	TNMG 160404R-HM	0.4	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●														
			160404L-HM	0.4	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●														
			160408R-HM	0.8	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●														
			160408L-HM	0.8	●	●	●	●	●	●	●	●	●	●		●						●	●	●	●														
	MM 10°	P	TNGG 160404R-MM	0.4																																		
			160404L-MM	0.4																																		
			160408R-MM	0.8																																		
			160408L-MM	0.8																																		
Heavy Cutting	MP 0°	P	TNMM 160404N-MP	0.4			●			●																												
			160408N-MP	0.8			●	●	●	●	●																												
			160412N-MP	1.2			●	●	●	●	●																												
			160416N-MP	1.6			●	●	●	●	●																												
	HP 0°	P	TNMM 160408N-HP	0.8			●	●		●	●																												
			160412N-HP	1.2			●	●		●	●																												

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Negative Inserts

TN Triangular type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TN■■1604●●

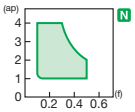
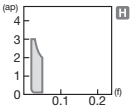
Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application

P	Steel	● ○ ● ✖ ○ ○ ✖ ● ○ ● ✖ ○ ○ ✖ ● ○ ● ✖ ○ ○ ✖ ● ○ ● ✖ ○ ○ ✖ ● ○ ● ✖ ○ ○ ✖ ● ○
M	Stainless Steel	✖ ✖ ● ● ✖ ● ● ✖ ○ ○ ✖ ● ● ✖ ○ ○ ✖ ● ● ✖ ○ ○ ✖ ● ● ✖ ○ ○ ✖ ● ● ✖ ○ ○
K	Cast Iron	✖ ✖ ○ ○ ✖ ○ ○ ● ● ✖ ○ ○ ● ● ✖ ○ ○ ✖ ✖ ● ● ✖ ○ ○ ● ● ✖ ○ ○ ● ● ✖ ○ ○
N	Non-Ferrous Metal	○ ●
S	Exotic Alloy	○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ○ ● ● ✖ ○ ○ ✖ ● ● ✖ ○ ○ ✖ ○ ○ ○ ○ ○ ○ ○ ○
H	Hardened Steel	● ○

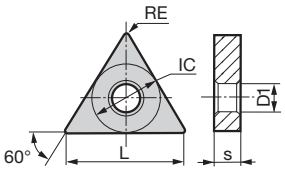
SUMIBORON (CBN) Inserts L80 on | SUMIDIA (PCD) Inserts M16 | Ceramic Inserts B128

Applicable External Holders C29 to C35, D16, D20 | Applicable Boring Bars E15, E47 to E49

					Coated Carbide																										Coated Cermet			Cermet	Cemented Carbide						
					CVD							PVD	CVD						PVD													PVD									
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
For Aluminum	**AX** 30°		**TNGG 160402R-AX**	0.2																																				
			160402L-AX	0.2																																						
			160404R-AX	0.4																																						
			160404L-AX	0.4																																						
			160408R-AX	0.8																																						
			160408L-AX	0.8																																						
Light Cutting of Hardened Steel	**GH** 3°		**TNGG 160402N-GH**	0.2																	●																				
			160404N-GH	0.4																	●																					
			160408N-GH	0.8																	●																					

Triangular type Negative Inserts

TN Triangular type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TN■■2204●●

Dimensions (mm)	Cutting Edge Length L	22.0	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

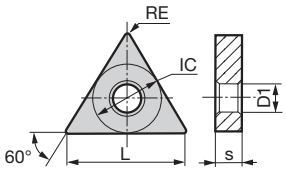
SUMIBORON (CBN) Inserts L85
Applicable External Holders C30 to C35
Applicable Boring Bars E48, E49

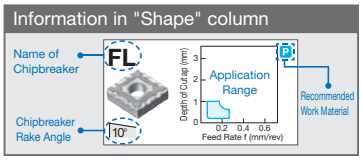
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	PVD: AC6030M	AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	SE		TNMG 220404N-SE	0.4	●	●	●	●	●	●	●																																
			220408N-SE	0.8	●	●	●	●	●	●	●																																
			220412N-SE	1.2	●	●	●	●	●	●	●																																
Light Cutting	GX		TNGG 220408R-GX	0.8																																						
			220408L-GX	0.8																																				●		
Light to Medium Cutting	SX		TNMG 220404N-SX	0.4	●	●	●	●		●	●																																
			220408N-SX	0.8	●	●	●	●		●	●																																
			220412N-SX	1.2	●	●	●	●		●	●																																
	UP		TNMG 220408N-UP	0.8						●	●												●	●	●	●	●													●			
			220412N-UP	1.2						●	●												●	●	●	●	●													●			
Medium Cutting	GU		TNMG 220404N-GU	0.4			●			●							●	●																								
			220408N-GU	0.8	●	●	●	●	●	●	●						●	●																								
			220412N-GU	1.2	●	●	●	●	●	●	●						●	●																								
	GE		TNMG 220408N-GE	0.8	●	●	●	●	●	●	●																																
			220412N-GE	1.2	●	●	●	●	●	●	●																																
	UX		TNMG 220408N-UX	0.8	●	●	●	●	●	●	●																																
			220412N-UX	1.2	●	●	●	●	●	●	●																																
	UG		TNMG 220408N-UG	0.8			●	●		●	●																																
			220412N-UG	1.2			●	●		●	●																																
			220416N-UG	1.6																																						
	UM		TNMG 220404R-UM	0.4																																●						
			220404L-UM	0.4																																●						
			220408R-UM	0.8																																●						
			220408L-UM	0.8																																●						
	UM		TNGG 220404R-UM	0.4																																●	●	●	●	●		
			220404L-UM	0.4																																●	●	●	●	●		
			220408R-UM	0.8																																●	●		●	●		
			220408L-UM	0.8																																●	●		●	●		
			TNMA 220404	0.4																																						
			220408	0.8													●	●	●	▲	▲																		●		
			220412	1.2													●	●	●	▲	▲																		●		
			220416	1.6													●	●	●	▲	▲																				
			220420	2.0																																						

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Negative Inserts

TN Triangular type Negative With Hole





Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TN■■2204●●

Dimensions (mm)	Cutting Edge Length L	22.0	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L85

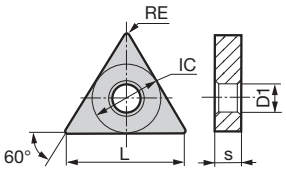
Applicable External Holders C30 to C35 Applicable Boring Bars E48, E49

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	CVD: AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	Cemented Carbide: T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			TNGA 220404	0.4																																			●		
			220408	0.8																																			●		
			220412	1.2																																					
			220416	1.6																																			●		
Medium to Roughing	MU		TNMG 220408N-MU	0.8	●	●	●	●	●	●	●												●	●	●	●	●														
			220412N-MU	1.2	●	●	●	●	●	●	●																														
			220416N-MU	1.6	●	●	●	●	●	●	●																														
	ME		TNMG 220408N-ME	0.8	●	●	●	●	●	●	●						●	●																						
			220412N-ME	1.2	●	●	●	●	●	●	●						●	●																						
			220416N-ME	1.6	●	●	●	●	●	●	●						●	●																						
	MX		TNMG 220408N-MX	0.8		●	●	●		●	●																														
			220412N-MX	1.2		●	●	●		●	●																														
	UZ		TNMG 220408N-UZ	0.8			●	●		●	●						●	●	●	▲	▲																		●	●	
			220412N-UZ	1.2			●	●		●	●						●	●	●	▲	▲																		●		
			220416N-UZ	1.6			●	●		●	●						●	●	●	▲	▲																				
			220420N-UZ	2.0																																					
	GZ		TNMG 220408N-GZ	0.8													●	●	●	▲	▲																			
			220412N-GZ	1.2													●	●	●	▲	▲																			
			220416N-GZ	1.6													●	●	●	▲	▲																			
	HM		TNMG 220404R-HM	0.4	●	●	●	●	●	●	●					●																								
			220404L-HM	0.4	●	●	●	●	●	●	●					●																								
			220408R-HM	0.8	●	●	●	●	●	●	●					●																								
			220408L-HM	0.8	●	●	●	●	●	●	●					●																								
	MM		TNGG 220404R-MM	0.4																																				
			220404L-MM	0.4																																				
			220408R-MM	0.8																																		●		
			220408L-MM	0.8																																		●		
			220412R-MM	1.2																																				
			220412L-MM	1.2																																				
			220416R-MM	1.6																																				
			220416L-MM	1.6																																				
Heavy Cutting	MP		TNMM 220408N-MP	0.8			●	●	●	●	●																													
			220412N-MP	1.2			●	●	●	●	●																														
			220416N-MP	1.6			●	●	●	●	●																														
	HG		TNMM 220408N-HG	0.8			●	●	●	●	●																														
			220412N-HG	1.2			●	●	●	●	●																														
			220416N-HG	1.6			●	●	●	●	●																														
	HP		TNMM 220408N-HP	0.8			●	●		●	●																														
			220412N-HP	1.2			●	●		●	●																														
			220416N-HP	1.6			●			●																														

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Negative Inserts

TN Triangular type Negative With Hole



Grade Selection Guide C2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TN■■2706●●

Dimensions (mm)	Cutting Edge Length L	27.5	Thickness S	6.35
	Inscribed Circle IC	15.875	Hole Dia. D1	6.35

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Applicable External Holders C30, C31

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M (PVD)	AC610M	AC630M (CVD)	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U (PVD)	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting	UG	P M	TNMG 270608N-UG	0.8																																							
			270612N-UG	1.2																																							
			270616N-UG	1.6																																							
Medium to Roughing	MU	P M S	TNMG 270612N-MU	1.2			●	●		●	●																															
			270616N-MU	1.6			●			●																																
	UZ	K	TNMG 270608N-UZ	0.8			●			●																															
			270612N-UZ	1.2			●			●																																
			270616N-UZ	1.6			●	●		●	●																															
Rough to Heavy Cutting	MP	P M	TNMM 270612N-MP	1.2			●			●																															
			270616N-MP	1.6			●			●																																
Heavy Cutting	HP	P	TNMM 270612N-HP	1.2			●	●		●	●																															
			270616N-HP	1.6			●	●		●	●																															

TN■■3309●●

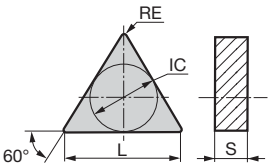
Dimensions (mm)	Cutting Edge Length L	33.0	Thickness S	9.52
	Inscribed Circle IC	19.05	Hole Dia. D1	7.93

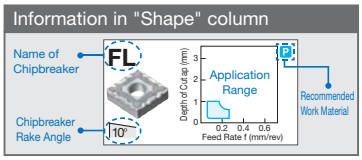
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M (PVD)	AC610M	AC630M (CVD)	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U (PVD)	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	EM	M S	TNMG 330924N-EM	2.4			●	●					●	●									●	●	●																	

Triangular type Negative Inserts

TN Triangular type / Negative / Without Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

TN■■1603●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	3.18
	Inscribed Circle IC	9.525		

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M (PVD)	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			**TNMN 160304**	0.4																																							
			160308	0.8																																							
Medium Cutting			**TNGN 160304**	0.4																																							
			160308	0.8																																							
			160312	1.2																																							

TN■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	4.76
	Inscribed Circle IC	9.525		

SUMIBORON (CBN) Inserts ☞L86

Applicable External Holders ☞L122

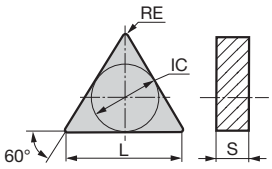
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M (PVD)	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			**TNMN 160404**	0.4																																		●			
			160408	0.8													●	●	●	▲	▲																●	●			
			160412	1.2													●	●	●	▲	▲																					
			160416	1.6													●	●	●	▲	▲																					
			160420	2.0																																							
Medium Cutting			**TNGN 160404**	0.4																																							
			160408	0.8																																					●		
			160412	1.2																																							

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Negative Inserts

TN Triangular type Negative Without Hole



Grade Selection Guide B2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

TN■■1607●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	7.94
	Inscribed Circle IC	9.525		

Ceramic Inserts B128

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			**TNGN 160712**	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

TN■■2204●●

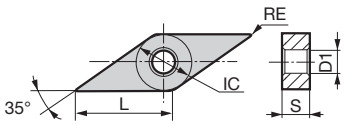
Dimensions (mm)	Cutting Edge Length L	22.0	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	

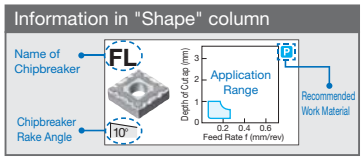
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			**TNMN 220408**	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●		●					
			220412	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—								
			220416	1.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—								
			TNGN 220404	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—								
			220408	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—								
			220412	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—								
			220416	1.6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—								

35° Diamond type Negative Inserts

VN 35° Diamond type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

VN■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.6	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application

P	Steel	● ○ ● ✱ ○ ○ ✱		○ ● ✱ ○ ○		○ ● ✱ ○ ○		✱ ○ ● ✱ ○		✱ ○ ● ✱ ○		✱ ○ ● ✱ ○		✱ ○ ● ✱ ○
M	Stainless Steel	✱		✱		✱ ● ✱ ○ ○		✱ ○ ● ✱ ○		✱ ○ ● ✱ ○		✱ ○ ● ✱ ○		✱ ○ ● ✱ ○
K	Cast Iron	✱		✱		✱		● ● ✱ ○ ○		✱ ○ ● ✱ ○		✱ ○ ● ✱ ○		●
N	Non-Ferrous Metal															●
S	Exotic Alloy								● ● ✱ ○ ○		✱ ○ ● ✱ ○		✱ ○ ● ✱ ○			
H	Hardened Steel									●						

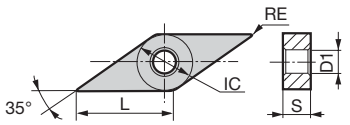
SUMIBORON (CBN) Inserts L103 on | SUMIDIA (PCD) Inserts M23 | SUMIDIA BINDERLESS Inserts M28
Ceramic Inserts B128 | Applicable External Holders C38, C39

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FB** 27°		VNMG 160404N-FB	0.4										●																												
			160408N-FB	0.8										●																												
	FA 20°		VNMG 160404N-FA	0.4																																					
			160408N-FA	0.8																																					
	FL 10°		VNMG 160404N-FL	0.4			●			●						●																									
			160408N-FL	0.8			●			●						●																									
			160412N-FL	1.2																																					
	FE 20°		VNMG 160402N-FE	0.2	●	●	●	●	●		●		●	●																										
			160404N-FE	0.4	●	●	●	●	●		●		●	●																										
			160408N-FE	0.8	●	●	●	●	●		●		●	●																										
			160412N-FE	1.2	●	●	●	●	●		●		●	●																										
Finishing	**LU** 10°		VNMG 160402N-LU	0.2									●			●																									
			160404N-LU	0.4	●	●	●		●	●			●			●																									
			160408N-LU	0.8	●	●	●		●	●			●			●																									
			160412N-LU	1.2	●	●			●																																
	SU 13°		VNMG 160402N-SU	0.2								●	●	●		●							●	●	●		●		●											
			160404N-SU	0.4	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●	●		●											
			160408N-SU	0.8	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●	●		●											
	SU 13°		VNGG 160402N-SU	0.2																																				
			160404N-SU	0.4																																				
			160408N-SU	0.8																																				
	SE 5°		VNMG 160404N-SE	0.4	●	●	●	●	●	●	●																												
			160408N-SE	0.8	●	●	●	●	●	●	●																												
	EF 20°		VNMG 160402N-EF	0.2	●	●	●	●				●	●	●		●							●	●	●	●	●													
			160404N-EF	0.4	●	●	●	●				●	●	●		●							●	●	●	●	●													
			160408N-EF	0.8	●	●	●	●				●	●	●		●							●	●	●	●	●													
	EF 20°		VNGG 160402N-EF	0.2												●								●	●	●	●													
			160404N-EF	0.4												●								●	●	●	●													
	FY 15°		VNGG 160402R-FY	0.2																								●												
			160402L-FY	0.2																								●												
			160404R-FY	0.4																								●												
			160404L-FY	0.4																								●												
			160408R-FY	0.8																								●												
			160408L-FY	0.8																								●												

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

35° Diamond type Negative Inserts

VN 35° Diamond type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

VN■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.6	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L103 on
SUMIDIA (PCD) Inserts M23
SUMIDIA BINDERLESS Inserts M28
Ceramic Inserts B128
Applicable External Holders C38, C39

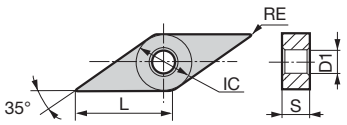
Coated Carbide (CVD / PVD) | Coated Cermet (PVD) | Cermet | Cemented Carbide

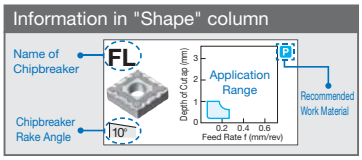
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FX** 14°	P	VNGG 160402R-FX	0.2																							●														
			160402L-FX	0.2																							●														
			160404R-FX	0.4																							●														
			160404L-FX	0.4																							●														
			160408R-FX	0.8																							●														
			160408L-FX	0.8																							●														
Light to Medium Cutting	**SX** 3°	P	VNMG 160404N-SX	0.4	●	●	●	●	●	●	●																			●	●		●								
			160408N-SX	0.8	●	●	●	●	●	●	●																			●	●		●								
			160412N-SX	1.2																																					
	EX 16°	M S	VNMG 160404N-EX	0.4								●	●	●	▲	●						●	●	●	●	●		●													
			160408N-EX	0.8								●	●	●	▲	●						●	●	●	●	●		●													
	UP 10°	M S	VNMG 160404N-UP	0.4						●	●	●	●	●		●																						●			
			160408N-UP	0.8						●	●	●	●	●		●																						●			
Medium Cutting	**GU** 7°	P M	VNMG 160404N-GU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●	●	●				●	●	●		●		●			●	●		●							
			160408N-GU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●	●	●				●	●	●		●		●			●	●		●							
			160412N-GU	1.2	●	●	●	●		●	●			●			●	●				●	●	●		●		●													
	GE 3°	P	VNMG 160404N-GE	0.4	●	●	●	●	●	●	●																													
			160408N-GE	0.8	●	●	●	●	●	●	●																													
			160412N-GE	1.2	●	●	●	●	●	●	●																													
	UX 0°	P K	VNMG 160404N-UX	0.4	●	●	●	●	●	●	●																													
			160408N-UX	0.8	●	●	●	●	●	●	●																													
			160412N-UX	1.2	●	●	●	●	●	●	●																													
	UG 4°	P M	VNMG 160404N-UG	0.4			●	●		●	●																													
			160408N-UG	0.8			●	●		●	●																													
	EG 0°	M	VNMG 160404N-EG	0.4	●	●	●	●				●	●	●									●	●	●														●	●	
			160408N-EG	0.8	●	●	●	●				●	●	●		●							●	●	●	●	●												●	●	
			160412N-EG	1.2	●	●	●	●				●	●	●									●	●	●															
			VNMA 160404	0.4													●	●	●	▲	▲																			
			160408	0.8													●	●	●	▲	▲																			
			160412	1.2													●	●	●	▲	▲																			
			VNGA 160404	0.4																		●																		
			160408	0.8																		●																		

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

35° Diamond type Negative Inserts

VN 35° Diamond type Negative With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

VN■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.6	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L103 on | SUMIDIA (PCD) Inserts M23 | SUMIDIA BINDERLESS Inserts M28
Ceramic Inserts B128 | Applicable External Holders C38, C39

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	UZ	K	VNMG 160404N-UZ	0.4			●	●		●	●						●	●	●	▲	▲		●	●	●	●	●									●	●		●			
			160408N-UZ	0.8			●	●		●	●						●	●	●	▲	▲		●	●	●	●	●									●	●		●			
			160412N-UZ	1.2			●	●		●	●						●	●	●	▲	▲															●			●			
	GZ	K	VNMG 160404N-GZ	0.4						●							●	●	●	▲	▲																					
			160408N-GZ	0.8						●							●	●	●	▲	▲																					
			160412N-GZ	1.2						●							●	●	●	▲	▲																					
For Aluminum	AX	N	VNGG 160402R-AX	0.2																																					●
			160402L-AX	0.2																																					●
			160404R-AX	0.4																																					●
			160404L-AX	0.4																																					●
			160408R-AX	0.8																																					●
			160408L-AX	0.8																																					●

VN■■2204●●

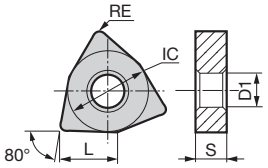
Dimensions (mm)	Cutting Edge Length L	22.1	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	UZ	K	VNMG 220408N-UZ	0.8																																					
			220412N-UZ	1.2																																					

Trigon type Negative Inserts

WN Trigon type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

WN□□06T3●●

Dimensions (mm)	Cutting Edge Length L	6.5	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M (PVD)	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	SU		WNMG 06T304N-SU	0.4			●			●																																	
			06T308N-SU	0.8			●			●																																		
Medium Cutting	UG		WNMG 06T304N-UG	0.4			●			●																																		
			06T308N-UG	0.8			●			●																																		

WN□□0604●●

Dimensions (mm)	Cutting Edge Length L	6.5	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Applicable External Holders C43
Applicable Boring Bars E64, E65

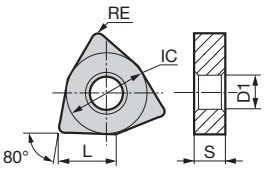
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

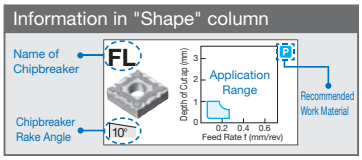
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M (PVD)	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FB		WNMG 060404N-FB	0.4										●																	●	●	▲		●							
			060408N-FB	0.8										●																	●	●	▲		●							
	FE		WNMG 060404N-FE	0.4	●	●	●	●	●		●		●	●																	●	●	▲		●							
			060408N-FE	0.8	●	●	●	●	●		●		●	●																	●	●	▲		●							
Finishing	LU		WNMG 060404N-LU	0.4	●	●	●	●	●	●	●																				●	●										
			060408N-LU	0.8	●	●	●	●	●	●	●																				●	●										
			060412N-LU	1.2	●	●	●	●	●	●	●																				●											
	LUW	→B131 Wiper	WNMG 060404N-LUW	0.4	●	●	●		●	●			●			●															●	●			●							
			060408N-LUW	0.8	●	●	●		●	●			●			●															●	●			●							
	SU		WNMG 060404N-SU	0.4	●	●	●	●	●	●	●	●	●																		●	●										
			060408N-SU	0.8	●	●	●	●	●	●	●	●	●																		●	●										
			060412N-SU	1.2	●	●	●	●	●	●	●	●	●																		●											
	SEW	→B131 Wiper	WNMG 060404N-SEW	0.4	●	●	●	●	●	●	●																																
			060408N-SEW	0.8	●	●	●	●	●	●	●																																
	EF		WNMG 060404N-EF	0.4	●	●	●	●				●	●	●									●	●	●		●																
			060408N-EF	0.8	●	●	●	●				●	●	●									●	●	●		●																

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Trigon type Negative Inserts

WN Trigon type Negative With Hole





● Continuous Cutting 1st Recommendation
○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation
◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation
✖ Interrupted Cutting 2nd Recommendation

WN■■0604●●

Dimensions (mm)	Cutting Edge Length L	6.5	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	3.81

Recommended Application

P	Steel	● ◔ ● ✖ ○ ◔ ✖ ● ✖ ◔ ○ ◔ ✖ ✖ ✖ ● ● ✖ ○ ◔ ✖ ✖ ✖ ● ✖ ● ●
M	Stainless Steel	✖ ✖ ✖ ✖ ● ● ✖ ○ ◔ ✖ ✖ ✖ ✖ ✖ ● ●
K	Cast Iron	✖ ✖ ✖ ✖ ● ● ✖ ○ ◔ ✖ ✖ ✖ ●
N	Non-Ferrous Metal	●
S	Exotic Alloy	● ● ✖ ◔ ✖ ✖
H	Hardened Steel	●

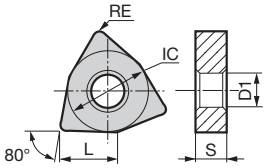
Applicable External Holders C43 | Applicable Boring Bars E64, E65

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	Cemented Carbide: T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting	**GU**		WNMG 060404N-GU	0.4	●	●	●	●	●	●	●	●	●	●			●	●													●	●										
			060408N-GU	0.8	●	●	●	●	●	●	●	●	●	●			●	●													●	●										
			060412N-GU	1.2	●	●	●	●	●	●	●	●	●	●			●	●													●											
	GE		WNMG 060408N-GE	0.8	●	●	●	●	●	●	●																														
			060412N-GE	1.2	●	●	●	●	●	●	●																														
	GUW →B131 Wiper		WNMG 060408N-GUW	0.8	●	●	●	●	●	●	●																														
	UG		WNMG 060404N-UG	0.4			●			●																														
			060408N-UG	0.8			●			●																														
	EG		WNMG 060408N-EG	0.8	●	●	●	●				●	●	●									●	●	●		●														
			060412N-EG	1.2	●	●	●	●				●	●	●									●	●	●		●														
Medium to Roughing	**MU**		WNMG 060408N-MU	0.8			●			●																														
			060412N-MU	1.2			●			●																														
	ME		WNMG 060408N-ME	0.8	●	●	●	●	●	●	●							●	●																					
			060412N-ME	1.2	●	●	●	●	●	●	●							●	●																					
	GZ		WNMG 060408N-GZ	0.8													●	●	●	▲	▲																			
			060412N-GZ	1.2													●	●	●	▲	▲																			

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Trigon type Negative Inserts

WN Trigon type Negative With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

WN■■0804●●

Dimensions (mm)	Cutting Edge Length L	8.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L114, L115
Applicable External Holders C42, C43
Applicable Boring Bars E64, E65

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FB 27°		WNMG 080402N-FB	0.2										●																	●	●	▲	●	●							
			080404N-FB	0.4										●																	●	●	▲	●	●							
			080408N-FB	0.8										●																	●	●	▲	●	●							
	FA 20°		WNMG 080402N-FA	0.2																											●	●	▲	●	●							
			080404N-FA	0.4																											●	●	▲	●	●							
			080408N-FA	0.8																											●	●	▲	●	●							
	FL 10°		WNMG 080404N-FL	0.4			●			●						●															●	●	▲	●	●							
			080408N-FL	0.8			●			●						●															●	●	▲	●	●							
	FE 20°		WNMG 080402N-FE	0.2	●	●	●	●	●		●		●	●																	●	●	▲	●	●							
			080404N-FE	0.4	●	●	●	●	●		●		●	●																	●	●	▲	●	●							
			080408N-FE	0.8	●	●	●	●	●		●		●	●																	●	●	▲	●	●							
			080412N-FE	1.2	●	●	●	●	●		●		●	●																	●	●	▲	●	●							
Finishing	LU 10°		WNMG 080404N-LU	0.4	●	●	●	●	●	●	●		●			●															●	●	▲	●	●							
			080408N-LU	0.8	●	●	●	●	●	●	●		●			●															●	●	▲	●	●							
			080412N-LU	1.2	●	●	●	●	●	●	●		●			●															●	●	▲		●							
	LUW 10° →B131 Wiper		WNMG 080404N-LUW	0.4	●	●	●		●	●			●			●															●	●	▲		●							
			080408N-LUW	0.8	●	●	●		●	●			●			●															●	●	▲		●							
			080412N-LUW	1.2	●	●	●		●	●			●			●															●	●	▲		●							
	SU 13°		WNMG 080404N-SU	0.4	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●	●		●		●	●	▲	●	●							
			080408N-SU	0.8	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●	●		●		●	●	▲	●	●							
			080412N-SU	1.2	●	●	●	●	●	●	●	●	●	●		●							●	●	●	●	●		●		●	●	▲	●	●							
	SU 13°		WNGG 080404N-SU	0.4																											●	●	▲	●	●							
	SE 5°		WNMG 080404N-SE	0.4	●	●	●	●	●	●	●																				●	●		●	●							
			080408N-SE	0.8	●	●	●	●	●	●	●																				●	●		●	●							
			080412N-SE	1.2	●	●	●	●	●	●	●																															
	SEW 5° →B131 Wiper		WNMG 080404N-SEW	0.4	●	●	●		●	●																					●	●			●							
			080408N-SEW	0.8	●	●	●		●	●																					●	●			●							
			080412N-SEW	1.2	●	●	●		●	●																															
	EF 20°		WNMG 080404N-EF	0.4	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●	
			080408N-EF	0.8	●	●	●	●				●	●	●		●							●	●	●	●	●													●	●	

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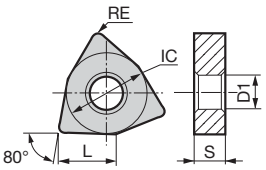
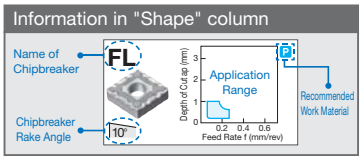
Trigon type Negative Inserts

WN Trigon type Negative With Hole





● Continuous Cutting 1st Recommendation ◯ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◯ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

WN■■0804●●

Dimensions (mm)	Cutting Edge Length L	8.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞L114, L115

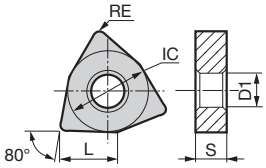
Applicable External Holders ☞C42, C43 Applicable Boring Bars ☞E64, E65

					Coated Carbide																										Coated Cermet		Cermet	Cemented Carbide					
					CVD						PVD		CVD					PVD													PVD								
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	**SX** 3°		WNMG 080404N-SX	0.4	●	●	●	●		●	●																			●	●	▲		●						
			080408N-SX	0.8	●	●	●	●	●	●	●																			●	●	▲		●						
			080412N-SX	1.2	●	●	●	●	●	●	●																														
	EX 16°		WNMG 080404N-EX	0.4								●	●	●	▲	●						●	●	●	●	●		●													
			080408N-EX	0.8								●	●	●	▲	●						●	●	●	●	●		●													
			080412N-EX	1.2								●	●	●	▲	●						●	●	●	●	●		●													
	UP 10°		WNMG 080408N-UP	0.8						●	●	●	●	●		●						●	●	●	●	●		●													
			080412N-UP	1.2						●	●	●	●	●		●						●	●	●	●	●		●													
	GU 7°		WNMG 080404N-GU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●	●	●				●	●	●		●		●		●	●			●						
			080408N-GU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●	●	●				●	●	●		●		●		●	●			●						
			080412N-GU	1.2	●	●	●	●	●	●	●	●	●	●	▲	●	●	●				●	●	●		●		●												
	GE 3°		WNMG 080404N-GE	0.4	●	●	●	●	●	●	●																													
			080408N-GE	0.8	●	●	●	●	●	●	●																													
			080412N-GE	1.2	●	●	●	●	●	●	●																													
			080416N-GE	1.6	●	●	●	●	●	●	●																													
Medium Cutting	**GUW** 0° →B131 Wiper		WNMG 080408N-GUW	0.8	●	●	●		●	●																													
			080412N-GUW	1.2	●	●	●		●	●																													
	UX 0°		WNMG 080404N-UX	0.4	●	●	●	●	●	●	●																													
			080408N-UX	0.8	●	●	●	●	●	●	●																													
			080412N-UX	1.2	●	●	●	●	●	●	●																													
	UG 4°		WNMG 080404N-UG	0.4			●	●		●	●																													
			080408N-UG	0.8			●	●		●	●																													
			080412N-UG	1.2			●	●		●	●																													
	EG 0°		WNMG 080404N-EG	0.4	●	●	●	●				●	●	●									●	●															●	●
			080408N-EG	0.8	●	●	●	●				●	●	●		●							●	●	●	●													●	●
			080412N-EG	1.2	●	●	●	●				●	●	●		●							●	●	●	●													●	●
			WNMA 080408	0.8													●	●	●	▲	▲																			
			080412	1.2													●	●	●	▲	▲																			
			080416	1.6													●	●	●	▲	▲																			
Medium to Roughing	**MU** 4°		WNMG 080408N-MU	0.8	●	●	●	●	●	●	●		●			●						●	●	●	●	●		●												
			080412N-MU	1.2	●	●	●	●	●	●	●		●			●						●	●	●	●	●		●												
			080416N-MU	1.6	●	●	●		●	●																													
	EM 0°		WNMG 080408N-EM	0.8	●	●	●	●				●	●	●									●	●	●															
			080412N-EM	1.2	●	●	●	●				●	●	●									●	●	●															

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Trigon type Negative Inserts

WN Trigon type / Negative / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

WN■■0804●●

Dimensions (mm)	Cutting Edge Length L	8.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.16

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

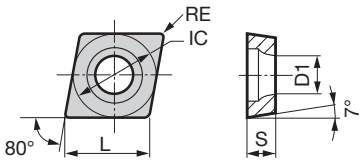
SUMIBORON (CBN) Inserts L114, L115
Applicable External Holders C42, C43
Applicable Boring Bars E64, E65

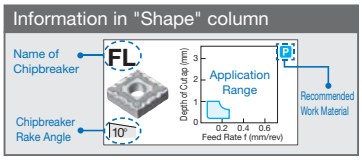
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	PVD: AC6030M	AC6040M	CVD: AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	**ME**	P	WNMG 080408N-ME	0.8	●	●	●	●	●	●	●						●	●																									
			080412N-ME	1.2	●	●	●	●	●	●	●						●	●																									
			080416N-ME	1.6	●	●	●	●	●	●	●						●	●																									
	MX	P	WNMG 080408N-MX	0.8		●	●	●		●	●																															
			080412N-MX	1.2		●	●	●		●	●																															
	UZ	K	WNMG 080404N-UZ	0.4			●			●							●	●	●	▲	▲		●	●	●	●	●																
			080408N-UZ	0.8			●	●		●	●						●	●	●	▲	▲		●	●	●	●	●																
			080412N-UZ	1.2			●	●		●	●						●	●	●	▲	▲		●	●	●	●	●																
	GZ	K	WNMG 080404N-GZ	0.4						●							●	●	●	▲	▲																					
			080408N-GZ	0.8						●							●	●	●	▲	▲																					
			080412N-GZ	1.2						●							●	●	●	▲	▲																					

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Positive Inserts

CC 80° Diamond type / 7° Pos. / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

CC■■03X1●●

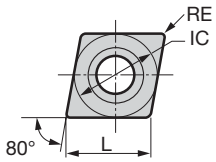
Dimensions (mm)	Cutting Edge Length L	3.55	Thickness S	1.4
	Inscribed Circle IC	3.5	Hole Dia. D1	1.9

Recommended Application

P	Steel	● ○ ● ✱ ○ ○ ✱ ○ ○ ○ ✱ ○ ○ ✱ ○ ○ ✱ ○ ○ ✱ ○ ○ ✱ ● ● ●

80° Diamond type Positive Inserts

CC 80° Diamond type / 7° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✲ Interrupted Cutting 2nd Recommendation

CC■■04X1●●

Dimensions (mm)	Cutting Edge Length L	4.37	Thickness S	1.8
	Inscribed Circle IC	4.3	Hole Dia. D1	2.3

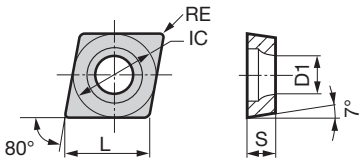
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

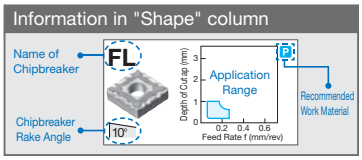
SUMIBORON (CBN) Inserts L44
SUMIDIA BINDERLESS Inserts M28
Applicable Boring Bars E18, E20

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	Coated Carbide (CVD) AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FYS**	P (ap) 2 1 0 0.2 0.4 (f)	CCGT 04X1003R-FYS	0.03																			●	●			●																
	15°		04X1003L-FYS	0.03																			●	●			●																
			04X101R-FYS	0.1																			●	●			●																
			04X101L-FYS	0.1																			●	●			●																
			04X102R-FYS	0.2																			●	●			●																
			04X102L-FYS	0.2																			●	●			●																
			04X104R-FYS	0.4																			●	●			●																
			04X104L-FYS	0.4																			●	●			●																
	FYS	P (ap) 2 1 0 0.2 0.4 (f)	CCET 04X1003R-FYS	0.03																								●															
	15°		04X1003L-FYS	0.03																								●															
			04X101R-FYS	0.1																								●															
			04X101L-FYS	0.1																								●															
			04X102R-FYS	0.2																								●															
			04X102L-FYS	0.2																								●															
			04X104R-FYS	0.4																								●															
			04X104L-FYS	0.4																								●															
	FY	P (ap) 2 1 0 0.2 0.4 (f)	CCGT 04X101R-FY	0.1																			●	●			●				●			●	●							
	15°		04X101L-FY	0.1																			●	●			●				●			●	●							
			04X102R-FY	0.2																			●	●			●				●			●	●							
			04X102L-FY	0.2																			●	●			●				●			●	●							
			04X104R-FY	0.4																			●	●			●				●			●	●							
			04X104L-FY	0.4																			●	●			●				●			●	●							
	FY	P (ap) 2 1 0 0.2 0.4 (f)	CCET 04X1003R-FY	0.03																								●			●			●	●							
	15°		04X1003L-FY	0.03																								●		●	●			●	●							
			04X101R-FY	0.1																								●			●			●	●							
			04X101L-FY	0.1																								●		●	●			●	●							
			04X102R-FY	0.2																								●			●			●	●							
			04X102L-FY	0.2																								●		●	●			●	●							
			04X104R-FY	0.4																								●			●			●	●							
			04X104L-FY	0.4																								●		●	●			●	●							

80° Diamond type Positive Inserts

CC 80° Diamond type / 7° Pos. / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

CC■■0602●●

Dimensions (mm)	Cutting Edge Length L	6.4	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞L45, L46 | SUMIDIA (PCD) Inserts ☞M10 | SUMIDIA BINDERLESS Inserts ☞M28

Applicable External Holders ☞C13, D13, D17, D22, D23 | Applicable Boring Bars ☞E18 to E20

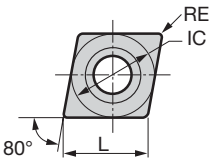
					Coated Carbide																					Coated Cermet			Cermet	Cemented Carbide						
					CVD						PVD		CVD					PVD									PVD										
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T15002Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FF**		CCGT 060201MN-FF New	< 0.1																			●	●			●													
			060202MN-FF New	< 0.2																			●	●			●													
			060204MN-FF New	< 0.4																			●	●			●													
	FB		CCMT 060202N-FB	0.2																								●		●	●	▲	●	●						
			060204N-FB	0.4																								●		●	●	▲	●	●						
	LU		CCMT 060202N-LU	0.2	●	●	●		●	●			●	●		●						—						●		●	●	▲	●	●						
			060204N-LU	0.4	●	●	●		●	●			●	●		●						—						●		●	●	▲	●	●						
	FP		CCMT 060202N-FP	0.2																													●						
			060208N-FP	0.8																													●						
	FC		CCGT 060201MN-FC	< 0.1																							●	●	●				●	●						
			060202MN-FC	< 0.2																							●	●	●				●	●						
			060204MN-FC	< 0.4																							●	●	●				●	●						
Finishing	**FX**		CCGT 0602003R-FX	0.03																			●	●			●	●					●	●						
			0602003L-FX	0.03																			●	●			●	●					●	●						
			060201R-FX	0.1																			●	●			●	●		●			●	●						
			060201L-FX	0.1																			●	●			●	●		●			●	●						
			060202R-FX	0.2																			●	●			●	●		●			●	●						
			060202L-FX	0.2																			●	●			●	●		●			●	●						
			060204R-FX	0.4																			●	●			●	●						●						
			060204L-FX	0.4																			●	●			●	●		●				●						
	FX		CCET 0602003R-FX	0.03																							●		●											
			0602003L-FX	0.03																							●		●											
			060201R-FX	0.1																							●		●											
			060201L-FX	0.1																							●		●											
			060202R-FX	0.2																							●		●											
			060202L-FX	0.2																							●		●											
			060204R-FX	0.4																							●		●											
			060204L-FX	0.4																							●		●											
	FY		CCET 0602003R-FY	0.03																							●		●											
			0602003L-FY	0.03																							●		●											
			0602008R-FY	0.08																																				
			0602008L-FY	0.08																																				
			060201R-FY	0.1																							●		●					●	●						
			060201L-FY	0.1																							●		●					●	●						
			0602018R-FY	0.18																																				
			0602018L-FY	0.18																																				
			060202R-FY	0.2																							●		●					●	●						
			060202L-FY	0.2																							●		●					●	●						
			060204R-FY	0.4																							●		●											
			060204L-FY	0.4																							●		●											

A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Positive Inserts

CC 80° Diamond type / 7° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

CC■■0602●●

Dimensions (mm)	Cutting Edge Length L	6.4	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L45, L46 | SUMIDIA (PCD) Inserts M10 | SUMIDIA BINDERLESS Inserts M28
Applicable External Holders C13, D13, D17, D22, D23 | Applicable Boring Bars E18 to E20

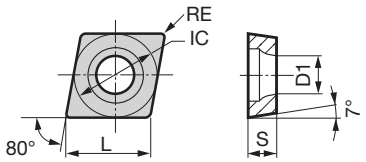
					Coated Carbide																						Coated Cermet		Cermet	Cemented Carbide					
					CVD							PVD	CVD					PVD									PVD									
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	LB		CCMT 060202N-LB	0.2		●	●	●		●	●	●	●	●																●	●	▲		●						
	15°		060204N-LB	0.4		●	●	●		●	●	●	●	●																●	●	▲		●						
			060208N-LB	0.8		●	●	●		●	●	●	●	●																●	●	▲		●						
	SU		CCMT 060202N-SU	0.2	●	●	●	●		●	●	●	●	●	▲	●						●	●	●				●		●	●	▲	●	●						
	8°		060204N-SU	0.4	●	●	●	●		●	●	●	●	●	▲	●						●	●	●				●		●	●	▲	●	●						
			060208N-SU	0.8	●	●	●	●		●	●	●	●	●	▲	●						●	●	●		●		●		●	●		●	●						
	SI		CCGT 060201MN-SI New	< 0.1																			●	●				●												
	15°		060202MN-SI New	< 0.2																			●	●				●												
			060204MN-SI New	< 0.4																			●	●				●												
	SC		CCMT 060204N-SC	0.4			●			●																										●				
	6°		CCGT 0602003N-SC	0.03																								●	●				●	●						
	SC		CCGT 060201MN-SC	< 0.1																								●	●	●	●	●	●	●	●					
	6°		060202MN-SC	< 0.2																								●	●	●	●	●	●	●	●					
			060204MN-SC	< 0.4																											●	●		●						
			CCMW 060204	0.4													●	●	●	▲	▲																				
			CCGW 060200	0																																				
			060201	0.1																																				
Light to Medium Cutting	GU		CCMT 060204N-GU	0.4	●	●	●	●				●	●	●											●						●	●			●						
	5°		060208N-GU	0.8	●	●	●	●				●	●	●											●						●	●			●						
For Aluminum	AG		CCGT 060202N-AG	0.2																																				●
	20°		060204N-AG	0.4																																				●
	AY		CCGT 060201R-AY	0.1																																				●
	15°		060201L-AY	0.1																																				●
			060202R-AY	0.2																																				●
			060202L-AY	0.2																																				●
			060204R-AY	0.4																																				●
			060204L-AY	0.4																																				●

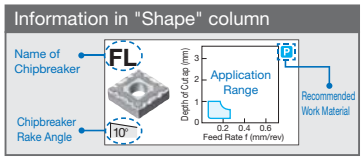
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Positive Inserts

CC 80° Diamond type / 7° Pos. / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

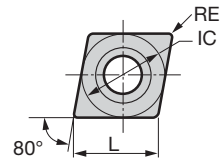
CC■■0802●●

Dimensions (mm)	Cutting Edge Length L	8.0	Thickness S	2.38
	Inscribed Circle IC	7.94	Hole Dia. D1	3.4

Recommended Application: P Steel ● ○ ✱ ✱ ○ ○ ✱ ✱ ✱ ○ ○ ○ ✱ ✱ ✱

80° Diamond type Positive Inserts

CC 80° Diamond type / 7° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation Interrupted Cutting 2nd Recommendation

CC■■09T3●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L47 on
SUMIDIA (PCD) Inserts M11
SUMIDIA BINDERLESS Inserts M28
Applicable External Holders C13, D13, D17, D22, D23
Applicable Boring Bars E12, E18 to E20

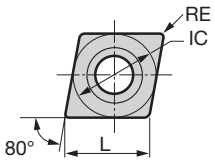
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	PVD: AC6030M	AC6040M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AZ150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FF		CCGT 09T301MN-FF New	< 0.1																			●	●			●															
			09T302MN-FF New	< 0.2																			●	●			●															
			09T304MN-FF New	< 0.4																			●	●			●															
	FB		CCMT 09T302N-FB	0.2																								●		●	●	▲	●	●								
			09T304N-FB	0.4																								●		●	●	▲	●	●								
			09T308N-FB	0.8																								●		●	●	▲	●	●								
	LU		CCMT 09T302N-LU	0.2																																					
			09T304N-LU	0.4	●	●	●		●	●			●	●	●													●		●	●	▲	●	●								
			09T308N-LU	0.8	●	●	●		●	●			●	●	●													●		●	●	▲	●	●								
	LUW →B131 Wiper		CCMT 09T304N-LUW	0.4	●	●	●		●	●					●															●	●	▲		●								
			09T308N-LUW	0.8	●	●	●		●	●					●															●	●	▲		●								
	FP		CCMT 09T302N-FP	0.2																														●								
			09T304N-FP	0.4																														●								
Finishing	FC		CCGT 09T301MN-FC	< 0.1																								●	●					●	●							
			09T302MN-FC	< 0.2																								●	●					●	●							
			09T304MN-FC	< 0.4																								●	●					●	●							
	FX		CCGT 09T3003R-FX	0.03																			●	●				●	●					●	●							
			09T3003L-FX	0.03																			●	●				●	●					●	●							
			09T301R-FX	0.1																			●	●				●	●		●			●	●							
			09T301L-FX	0.1																			●	●				●	●		●			●	●							
			09T302R-FX	0.2																			●	●				●	●		●			●	●							
			09T302L-FX	0.2																			●	●				●	●		●			●	●							
			09T304R-FX	0.4																			●	●				●	●													
			09T304L-FX	0.4																			●	●				●	●													
			09T308R-FX	0.8																			●	●				●	●													
			09T308L-FX	0.8																			●	●				●	●													
	FX		CCET 09T3003R-FX	0.03																								●		●												
			09T3003L-FX	0.03																								●		●												
			09T301R-FX	0.1																								●		●												
			09T301L-FX	0.1																								●		●												
			09T302R-FX	0.2																								●		●												
			09T302L-FX	0.2																								●		●												
			09T304R-FX	0.4																								●		●												
			09T304L-FX	0.4																								●		●												

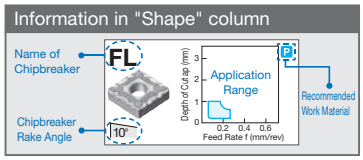
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Positive Inserts

CC 80° Diamond type / 7° Pos. / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

CC■■09T3●●

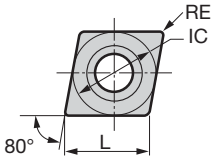
Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application

| | | |

80° Diamond type Positive Inserts

CC 80° Diamond type / 7° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

CC■■09T3●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel / M Stainless Steel / K Cast Iron / N Non-Ferrous Metal / S Exotic Alloy / H Hardened Steel

SUMIBORON (CBN) Inserts L47 on
SUMIDIA (PCD) Inserts M11
SUMIDIA BINDERLESS Inserts M28
Applicable External Holders C13, D13, D17, D22, D23
Applicable Boring Bars E12, E18 to E20

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
For Aluminum	**AG**	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) N	**CCGT 09T302N-AG**	0.2																																						●
	20°		**09T304N-AG**	0.4																																							●
			09T308N-AG	0.8																																							●
	AY	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) N	**CCGT 09T301R-AY**	0.1																																							●
	15°		**09T301L-AY**	0.1																																							●
			09T302R-AY	0.2																																							●
			09T302L-AY	0.2																																							●
			09T304R-AY	0.4																																							●
			09T304L-AY	0.4																																							●

CC■■1204●●

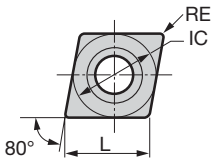
Dimensions (mm)	Cutting Edge Length L	12.9	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.5

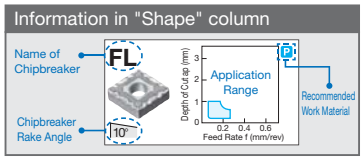
Recommended Application: P Steel / M Stainless Steel / K Cast Iron / N Non-Ferrous Metal / S Exotic Alloy / H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FP**	(ap) 2 1 0 0.2 0.4 (f) P	**CCMT 120404N-FP**	0.4																														●								
	10°		**120408N-FP**	0.8																														●								
Light Cutting	**SU**	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**CCMT 120404N-SU**	0.4	●	●	●	●	●	●	●											—	●	●	●																	—
	8°		**120408N-SU**	0.8	●	●	●	●	●	●	●											—	●	●	●																	—
	SC	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**CCMT 120408N-SC**	0.8			●			●												—															●					—
	6°																																									
Light to Medium Cutting	**GU**	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**CCMT 120408N-GU**	0.8	●	●	●	●														—																					—
	5°																																									

80° Diamond type Positive Inserts

CP 80° Diamond type / 11° Pos. / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

CP■■0602●●

Dimensions (mm)	Cutting Edge Length L	6.4	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy, H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	(CVD) AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FX**		**CPGT 060204L-FX**	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●			●	●	—	—	—	—	—	—	—
Light Cutting	**US**		**CPMT 060204N-US**	0.4												●						—								—	—	—	—	—	—	—	●	●				—

CP■■0802●●

Dimensions (mm)	Cutting Edge Length L	8.0	Thickness S	2.38
	Inscribed Circle IC	7.94	Hole Dia. D1	3.4

SUMIBORON (CBN) Inserts L52 SUMIDIA (PCD) Inserts M11
Applicable Boring Bars E21, E22

Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy, H Hardened Steel

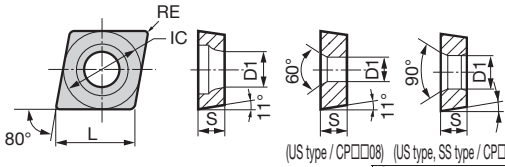
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	(CVD) AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB**		**CPMT 080204N-FB**	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	●	●	▲	●	●	—	—	—	—	—	—	—
	LU		**CPMT 080204N-LU**	0.4	●	●	●			●												—								—	●	●	▲	●	●	—	—	—	—	—	—	—
Finishing to Light Cutting	**SD**		**CPGT 080202N-SD**	0.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●					—	—	—	—	●	●	—	—	—	—	—	—	—
			080204N-SD	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●					—	●	●	▲	●	●	—	—	—	●	—	—	—
			080208N-SD	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●					—	●	●		●	●	—	—	—	—	—	—	—
Light Cutting	**LB**		**CPMT 080204N-LB**	0.4		●	●	●		●	●	●	●	●								—								—	●	●	▲		●	—	—	—	—	—	—	—
	SU		**CPMT 080204N-SU**	0.4	●	●	●	●	●	●	●				▲	●						—	●	●	●					—	●	●		●	●	—	—	—	—	—	—	—
			080208N-SU	0.8	●	●	●	●	●	●	●				▲	●						—	●	●	●					—	●	●	▲	●	●	—	—	—	—	—	—	—
	SS *1		**CPMT 080208N-SS**	0.8												●						—								—	—	—	—	—	—	—		—				—
			CPMW 080204	0.4													●	●	●	▲	▲	—								—	—	—	—	—	—	—	—	—	—	—	—	—
			080208	0.8													●	●	●	▲	▲	—								—	—	—	—	—	—	—	—	—	—	—	—	—
Light to Medium Cutting	**MU**		**CPMT 080204N-MU**	0.4	●	●	●			●	●						●	●	●	▲	▲	—								—	—	—	—	—	—	—	—	—	—	—	—	—
			080208N-MU	0.8	●	●	●			●	●						●	●	●	▲	▲	—								—	—	—	—	—	—	—	—	—	—	—	—	—

*1: Hole Dia. D1=4.8.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Positive Inserts

CP 80° Diamond type / 11° Pos. / With Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

CP■■0803●●

Dimensions (mm)	Cutting Edge Length L	8.0	Thickness S	3.18
	Inscribed Circle IC	7.94	Hole Dia. D1	3.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	**US** 10°	(ap) 2 1 0 0.2 0.4 (f) P	**CPMT 080308N-US**	0.8												●																						●	●				

CP■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞ L53
SUMIDIA (PCD) Inserts ☞ M11
Applicable Boring Bars ☞ E12, E21, E22

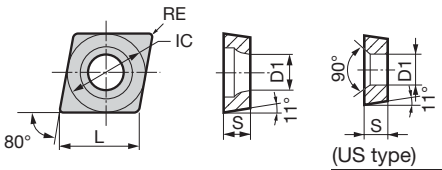
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB** 20°	(ap) 2 1 0 0.2 0.4 (f) P	**CPMT 090304N-FB**	0.4																									●													
			090308N-FB	0.8																									●													
	LU 15°	(ap) 2 1 0 0.2 0.4 (f) P	**CPMT 090304N-LU**	0.4	●	●	●		●	●		●	●			●														●	●	▲	●	●							
			090308N-LU	0.8	●	●	●		●	●		●	●			●														●	●	▲	●	●							
	LUW 10° →B131 Wiper	(ap) 2 1 0 0.2 0.4 (f) P	**CPMT 090304N-LUW**	0.4	●	●	●		●	●						●														●	●	▲		●							
			090308N-LUW	0.8	●	●	●		●	●						●														●	●	▲		●							
Finishing to Light Cutting	**SD** 0°	(ap) 2 1 0 0.2 0.4 (f) P	**CPGT 090302N-SD**	0.2																			●	●	●									●	●							
			090304N-SD	0.4																			●	●	●						●	●	▲	●	●			●				
			090308N-SD	0.8																			●	●	●						●	●		●	●							
Light Cutting	**LB** 15°	(ap) 2 1 0 0.2 0.4 (f) P	**CPMT 090304N-LB**	0.4		●	●	●		●	●	●	●	●																●	●	▲		●							
			090308N-LB	0.8		●	●	●		●	●	●	●	●																●	●	▲		●							
	SU 8°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**CPMT 090304N-SU**	0.4	●	●	●	●	●	●	●	●	●	▲	●								●	●	●						●	●	▲	●	●							
			090308N-SU	0.8	●	●	●	●	●	●	●	●	●	▲	●								●	●	●						●	●	▲	●	●							
	SS 5° *1	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**CPMH 090308N-SS**	0.8												●																						●					
	US 10°	(ap) 2 1 0 0.2 0.4 (f) P	**CPMH 090304N-US**	0.4																																						
			090308N-US	0.8												●																						●					

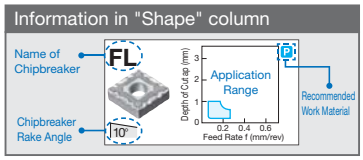
*1: Hole Dia. D1=4.8.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Positive Inserts

CP 80°Diamond type 11°Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

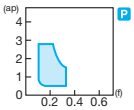
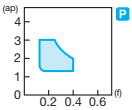
CP■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞L53 SUMIDIA (PCD) Inserts ☞M11

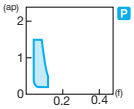
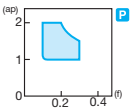
Applicable Boring Bars ☞E12, E21, E22

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	CVD: AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting			CPMW 090304	0.4												●	●	●	▲	▲																						
			090308	0.8												●	●	●	▲	▲																						
Light to Medium Cutting	GU 5°		CPMT 090304N-GU	0.4	●	●	●	●				●	●	●																●	●			●								
			090308N-GU	0.8	●	●	●	●				●	●	●																●	●			●								
	MU 0°		CPMT 090304N-MU	0.4	●	●	●		●	●		●	●			●	●	●	●	▲	▲																						
			090308N-MU	0.8	●	●	●		●	●		●	●			●	●	●	●	▲	▲																						

CP■■09T3●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

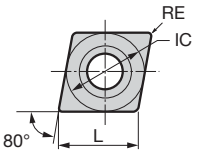
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

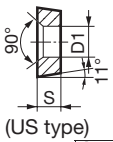
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	CVD: AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FX 15°		CPGT 09T308L-FX	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Light Cutting	US 10°		CPMT 09T308N-US	0.8												●						—								—								●	●			—

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

80° Diamond type Positive Inserts

CP 80° Diamond type / 11° Pos. / With Hole





(US type)

Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

CP■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.9	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.5

Recommended Application

		Coated Carbide																								Coated Cermet			Cermet	Cemented Carbide				
		CVD								PVD	CVD					PVD										PVD								
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing to Light Cutting	SD 0°	(ap) 2 1 0 0.2 0.4 (f) P	CPGT 120402N-SD	0.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—
			120404N-SD	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●	●	—	—	—	—	●	—	—	●	●	—	—	—	●	—	—	—
			120408N-SD	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	●	●	—	—	—	—	—	—	—	●	●	—	—	—	—	—	—	—
Light Cutting	US 10°	(ap) 2 1 0 0.2 0.4 (f) P	CPMH 120408N-US	0.8	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	●	—	—	—	—

CP■■1604●●

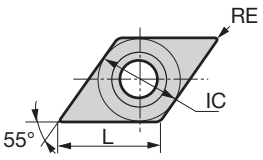
Dimensions (mm)	Cutting Edge Length L	16.1	Thickness S	4.76
	Inscribed Circle IC	15.875	Hole Dia. D1	6.5

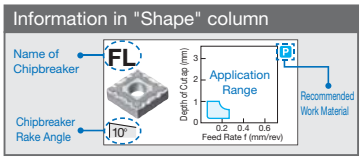
Recommended Application

		Coated Carbide																								Coated Cermet			Cermet	Cemented Carbide				
		CVD								PVD	CVD					PVD										PVD								
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	US 10°	(ap) 2 1 0 0.2 0.4 (f) P	CPMH 160408N-US	0.8	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—

55° Diamond type Positive Inserts

DC 55° Diamond type / 7° Pos. / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

DC■■0702●●

Dimensions (mm)	Cutting Edge Length L	7.7	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L62, L63 | SUMIDIA (PCD) Inserts M12 | SUMIDIA BINDERLESS Inserts M28

Applicable External Holders C19, D14, D18, D19, D24, D25 | Applicable Boring Bars E16, E26 to E30

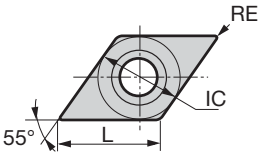
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	CVD AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	Cemented Carbide T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FF**		DCGT 070201MN-FF New	< 0.1																				●	●			●															
			070202MN-FF New	< 0.2																				●	●			●															
			070204MN-FF New	< 0.4																				●	●			●															
	FB		DCMT 070202N-FB	0.2																									●		●	●	▲	●	●							
			070204N-FB	0.4																									●		●	●	▲	●	●							
			070208N-FB	0.8																									●		●	●	▲	●	●							
	LU		DCMT 070202N-LU	0.2	●	●	●		●	●			●	●		●													●		●	●	▲	●	●							
			070204N-LU	0.4	●	●	●		●	●			●	●		●													●		●	●	▲	●	●							
	FP		DCMT 070202N-FP	0.2																															●								
			070204N-FP	0.4																															●								
	FC		DCGT 070201MN-FC	< 0.1																				●	●			●	●	●	●			●	●							
			070202MN-FC	< 0.2																				●	●			●	●	●	●			●	●							
			070204MN-FC	< 0.4																				●	●			●	●	●	●			●	●							
Finishing	**FX**		DCGT 0702003R-FX	0.03																				●	●			●	●	●				●	●							
			0702003L-FX	0.03																				●	●			●	●	●				●	●							
			070201R-FX	0.1																				●	●			●	●	●			●		●							
			070201L-FX	0.1																				●	●			●	●	●			●		●							
			070202R-FX	0.2																				●	●			●	●	●			●		●							
			070202L-FX	0.2																				●	●			●	●	●			●		●							
			070204R-FX	0.4																				●	●			●	●	●					●							
			070204L-FX	0.4																				●	●			●	●	●					●							
	FX		DCET 0702003R-FX	0.03																								●		●												
			0702003L-FX	0.03																								●		●												
			0702008R-FX	0.08																								●		●												
			0702008L-FX	0.08																								●		●												
			070201R-FX	0.1																								●		●												
			070201L-FX	0.1																								●		●												
			0702018R-FX	0.18																								●		●												
			0702018L-FX	0.18																								●		●												
			070204R-FX	0.4																								●		●												
			070204L-FX	0.4																								●		●												
	FYS		DCGT 0702003R-FYS	0.03																				●	●			●														
			0702003L-FYS	0.03																				●	●			●														
			070201R-FYS	0.1																				●	●			●														
			070201L-FYS	0.1																				●	●			●														
			070202R-FYS	0.2																				●	●			●														
			070202L-FYS	0.2																				●	●			●														
			070204R-FYS	0.4																				●	●			●														
			070204L-FYS	0.4																				●	●			●														

A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Positive Inserts

DC 55° Diamond type / 7° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

DC■■0702●●

Dimensions (mm)	Cutting Edge Length L	7.7	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L62, L63 | SUMIDIA (PCD) Inserts M12 | SUMIDIA BINDERLESS Inserts M28

Applicable External Holders C19, D14, D18, D19, D24, D25 | Applicable Boring Bars E16, E26 to E30

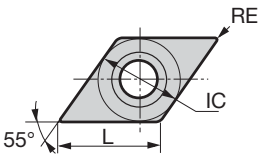
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FYS**		DCET 0702003R-FYS	0.03																																						
			0702003L-FYS	0.03																																						
			070201R-FYS	0.1																																						
			070201L-FYS	0.1																																						
			070202R-FYS	0.2																																						
			070202L-FYS	0.2																																						
			070204R-FYS	0.4																																						
			070204L-FYS	0.4																																						
	FY		DCGT 0702003R-FY	0.03																			●	●		●	●	●														
			0702003L-FY	0.03																			●	●		●	●	●														
			070201R-FY	0.1																			●	●		●	●	●							●							
			070201L-FY	0.1																			●	●		●	●	●							●							
			070202R-FY	0.2																			●	●		●	●	●							●							
			070202L-FY	0.2																			●	●		●	●	●							●							
			070204R-FY	0.4																			●	●		●	●	●							●							
			070204L-FY	0.4																			●	●		●	●	●							●							
	FY		DCET 0702003R-FY	0.03																								●		●												
			0702003L-FY	0.03																								●		●												
			0702008R-FY	0.08																								●		●												
			0702008L-FY	0.08																								●		●												
			070201R-FY	0.1																								●		●												
			070201L-FY	0.1																								●		●												
			0702018R-FY	0.18																								●		●												
			0702018L-FY	0.18																								●		●												
			070202R-FY	0.2																																						
			070202L-FY	0.2																																						
			070204R-FY	0.4																																						
			070204L-FY	0.4																																						
Finishing to Light Cutting	**SD**		DCGT 070202R-SD	0.2																												●			●	●						
			070202L-SD	0.2																												●			●	●						
			070204R-SD	0.4																												●			●	●						
			070204L-SD	0.4																												●			●	●						
Light Cutting	**LB**		DCMT 070202N-LB	0.2		●	●	●		●	●	●	●	●																	●	●	▲		●						
			070204N-LB	0.4		●	●	●		●	●	●	●	●																	●	●	▲		●						
			070208N-LB	0.8		●	●	●		●	●	●	●	●																	●	●	▲		●						
	SU		DCMT 070202N-SU	0.2	●	●	●	●		●	●	●	●	●	▲	●						●	●	●					●		●	●	▲	●	●						
			070204N-SU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●		●				●	●	●					●		●	●	▲	●	●						
			070208N-SU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●		●				●	●	●					●		●	●	▲	●	●						
	SI		DCGT 070201MN-SI	< 0.1											▲	●									●	●	●	●	●		●	●			●	●						
			070202MN-SI	< 0.2											▲	●									●	●	●	●	●		●	●			●	●						
			070204MN-SI	< 0.4											▲	●									●	●	●	●	●		●	●			●	●						
	SC		DCGT 0702003N-SC	0.03																								●	●	●					●	●						
			DCGT 070201MN-SC	< 0.1																								●	●	●	●	●			●	●						
			070202MN-SC	< 0.2																								●	●	●	●	●			●	●						
			070204MN-SC	< 0.4																								●	●	●	●	●			●	●						

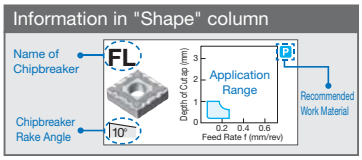
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Positive Inserts

DC 55° Diamond type / 7° Pos. / With Hole





● Continuous Cutting 1st Recommendation
○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation
◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation
✖ Interrupted Cutting 2nd Recommendation

DC■■0702●●

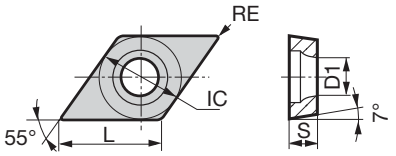
Dimensions (mm)	Cutting Edge Length L	7.7	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application

P	Steel	● ◔ ● ✖ ○ ◔ ✖	● ◔ ● ✖ ○ ◔ ✖	● ◔ ● ✖ ○ ◔ ✖

55° Diamond type Positive Inserts

DC 55° Diamond type / 7° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

DC■■0902●●

Dimensions (mm)	Cutting Edge Length L	9.7	Thickness S	2.38
	Inscribed Circle IC	7.94	Hole Dia. D1	3.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	SC		DCGT 090201MN-SC 090202MN-SC	< 0.1 < 0.2																														● ●	● ●								
			DCGW 090200 090201	0 0.1																																							

A "<" next to the corner radius RE indicates a negative tolerance.

DC■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.6	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

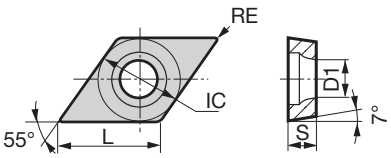
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

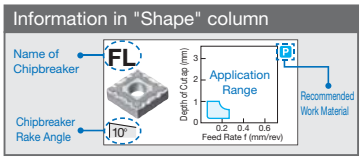
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	SC		DCGT 110301MN-SC 110302MN-SC	< 0.1 < 0.2																														● ●	● ●								
			DCGW 110300 110301	0 0.1																																							

A "<" next to the corner radius RE indicates a negative tolerance.

55° Diamond type Positive Inserts

DC 55° Diamond type / 7° Pos. / With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

DC■■11T3●●

Dimensions (mm)	Cutting Edge Length L	11.6	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L64 on | SUMIDIA (PCD) Inserts M13 | SUMIDIA BINDERLESS Inserts M28
Applicable External Holders C19, D14, D18, D19, D24, D25 | Applicable Boring Bars E13, E26 to E30

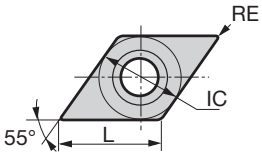
		Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	PVD AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FF	15°	(ap) 2 1 0 0.2 0.4 (f) P	DCGT 11T301MN-FF NEW	< 0.1																			●	●			●															
				11T302MN-FF NEW	< 0.2																			●	●			●															
				11T304MN-FF NEW	< 0.4																			●	●			●															
Finishing	FB	20°	(ap) 2 1 0 0.2 0.4 (f) P	DCMT 11T302N-FB	0.2																								●		●	●	▲	●	●							
				11T304N-FB	0.4																								●		●	●	▲	●	●							
				11T308N-FB	0.8																								●		●	●	▲	●	●							
	LU	15°	(ap) 2 1 0 0.2 0.4 (f) P	DCMT 11T302N-LU	0.2	●	●	●			●				●														●		●	●	▲	●	●							
				11T304N-LU	0.4	●	●	●		●	●			●	●		●												●		●	●	▲	●	●							
				11T308N-LU	0.8	●	●	●		●	●			●	●		●												●		●	●	▲	●	●							
	FP	10°	(ap) 2 1 0 0.2 0.4 (f) P	DCMT 11T308N-FP	0.8																														●							
	FC	15°	(ap) 2 1 0 0.2 0.4 (f) P	DCGT 11T301MN-FC	< 0.1																			●	●			●	●	●					●	●						
				11T302MN-FC	< 0.2																			●	●			●	●	●					●	●						
				11T304MN-FC	< 0.4																			●	●			●	●	●					●	●						
	FX	15°	(ap) 2 1 0 0.2 0.4 (f) P	DCGT 11T3003R-FX	0.03																			●	●			●	●	●					●	●						
				11T3003L-FX	0.03																			●	●			●	●	●					●	●						
				11T301R-FX	0.1																			●	●			●	●	●					●	●						
				11T301L-FX	0.1																			●	●			●	●	●					●	●						
				11T302R-FX	0.2																			●	●			●	●	●			●		●	●						
				11T302L-FX	0.2																			●	●			●	●	●			●		●	●						
				11T304R-FX	0.4																			●	●			●		●						●						
				11T304L-FX	0.4																			●	●			●		●						●						
	FX	15°	(ap) 2 1 0 0.2 0.4 (f) P	DCET 11T3003R-FX	0.03																									●												
				11T3003L-FX	0.03																									●												
				11T3008R-FX	0.08																									●												
				11T3008L-FX	0.08																									●												
				11T301R-FX	0.1																									●												
				11T301L-FX	0.1																									●												
				11T3018R-FX	0.18																									●												
				11T3018L-FX	0.18																									●												
				11T304R-FX	0.4																									●												
				11T304L-FX	0.4																									●												
	FYS	15°	(ap) 2 1 0 0.2 0.4 (f) P	DCGT 11T3003R-FYS	0.03																			●	●			●														
				11T3003L-FYS	0.03																			●	●			●														
				11T301R-FYS	0.1																			●	●			●														
				11T301L-FYS	0.1																			●	●			●														
				11T302R-FYS	0.2																			●	●			●														
				11T302L-FYS	0.2																			●	●			●														
				11T304R-FYS	0.4																			●	●			●														
				11T304L-FYS	0.4																			●	●			●														

A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Positive Inserts

DC 55° Diamond type / 7° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

DC■■11T3●●

Dimensions (mm)	Cutting Edge Length L	11.6	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L64 on
SUMIDIA (PCD) Inserts M13
SUMIDIA BINDERLESS Inserts M28
Applicable External Holders C19, D14, D18, D19, D24, D25
Applicable Boring Bars E13, E26 to E30

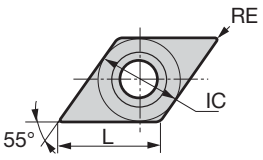
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FYS		DCET 11T3003R-FYS	0.03																								●															
			11T3003L-FYS	0.03																								●															
			11T301R-FYS	0.1																								●															
			11T301L-FYS	0.1																								●															
			11T302R-FYS	0.2																								●															
			11T302L-FYS	0.2																								●															
			11T304R-FYS	0.4																								●															
			11T304L-FYS	0.4																								●															
	FY		DCGT 11T3003R-FY	0.03																			●	●			●	●	●														
			11T3003L-FY	0.03																			●	●			●	●	●														
			11T301R-FY	0.1																			●	●			●	●	●						●	●							
			11T301L-FY	0.1																			●	●			●	●	●						●	●							
			11T302R-FY	0.2																			●	●			●	●	●						●	●							
			11T302L-FY	0.2																			●	●			●	●	●						●	●							
			11T304R-FY	0.4																			●	●			●	●	●						●	●							
			11T304L-FY	0.4																			●	●			●	●	●						●	●							
	FY		DCET 11T3003R-FY	0.03																								●			●												
			11T3003L-FY	0.03																								●			●												
			11T3008R-FY	0.08																								●			●												
			11T3008L-FY	0.08																								●			●												
			11T301R-FY	0.1																								●			●												
			11T301L-FY	0.1																								●			●												
			11T3018R-FY	0.18																								●			●												
			11T3018L-FY	0.18																								●			●												
			11T302R-FY	0.2																								●			●												
			11T302L-FY	0.2																								●			●												
			11T304R-FY	0.4																								●			●												
			11T304L-FY	0.4																								●			●												
Finishing to Light Cutting	SD		DCGT 11T304R-SD	0.4																											●			●	●							
			11T304L-SD	0.4																											●			●	●							
			11T308R-SD	0.8																											●			●	●							
			11T308L-SD	0.8																											●			●	●							
Light Cutting	LB		DCMT 11T302N-LB	0.2		●	●	●		●	●	●	●	●																	●	●	▲		●							
			11T304N-LB	0.4		●	●	●		●	●	●	●	●																	●	●	▲		●							
			11T308N-LB	0.8		●	●	●		●	●	●	●	●																	●	●	▲		●							
	SU		DCMT 11T302N-SU	0.2	●	●	●	●		●	●	●	●	●	▲	●							●	●						●		●	▲		●	●							
			11T304N-SU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●							●	●						●		●	▲		●	●							
			11T308N-SU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●							●	●						●		●	▲		●	●							
	SI		DCGT 11T301MN-SI	< 0.1											▲	●									●	●	●	●	●						●	●							
			11T302MN-SI	< 0.2											▲	●									●	●	●	●	●						●	●							
			11T304MN-SI	< 0.4											▲	●									●	●	●	●	●						●	●							
			11T308MN-SI	< 0.8											▲	●									●	●	●	●							●	●							
	SC		DCGT 11T3003N-SC	0.03																								●	●						●	●							
			DCGT 11T301MN-SC	< 0.1																								●	●			●	●		●	●							
			11T302MN-SC	< 0.2																								●	●			●	●		●	●							
			11T304MN-SC	< 0.4																								●	●			●	●		●	●							
			11T308MN-SC	< 0.8																								●	●			●	●		●	●							

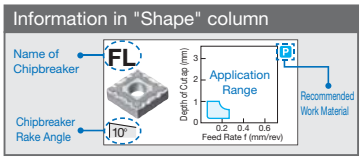
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Positive Inserts

DC 55° Diamond type / 7° Pos. / With Hole





Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

DC■■11T3●●

Dimensions (mm)	Cutting Edge Length L	11.6	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel / M Stainless Steel / K Cast Iron / N Non-Ferrous Metal / S Exotic Alloy / H Hardened Steel

SUMIBORON (CBN) Inserts L64 on | SUMIDIA (PCD) Inserts M13 | SUMIDIA BINDERLESS Inserts M28

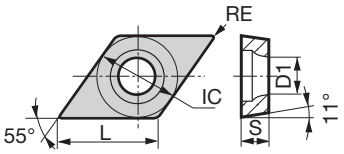
Applicable External Holders C19, D14, D18, D19, D24, D25 | Applicable Boring Bars E13, E26 to E30

					Coated Carbide																										Coated Cermet			Cermet	Cemented Carbide						
					CVD								PVD		CVD					PVD												PVD									
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting			DCMW 11T304	0.4												●	●	●	▲	▲																					
			11T308	0.8												●	●	●	▲	▲																					
			DCGW 11T300	0																																					
			11T301	0.1																																					
			11T302	0.2																	●																				
			11T304	0.4																	●																				
			11T308	0.8																	●																				
Light to Medium Cutting	GU 5°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	DCMT 11T302N-GU	0.2	●	●	●	●				●	●	●																●	●		●								
			11T304N-GU	0.4	●	●	●	●				●	●	●																●	●		●								
			11T308N-GU	0.8	●	●	●	●				●	●	●																●	●		●								
			11T312N-GU	1.2			●						●																												
	MU 0°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	DCMT 11T304N-MU	0.4	●	●	●		●	●		●	●			●	●	●	●	▲	▲																				
			11T308N-MU	0.8	●	●	●	●	●	●	●	●	●			●	●	●	●	▲	▲																				
For Aluminum	AG 20°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) N	DCGT 11T302N-AG	0.2																																				
			11T304N-AG	0.4																																				
			11T308N-AG	0.8																																				
	AY 15°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) N	DCGT 11T301R-AY	0.1																																				
			11T301L-AY	0.1																																				
			11T302R-AY	0.2																																				
			11T302L-AY	0.2																																				
			11T304R-AY	0.4																																				
			11T304L-AY	0.4																																				

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

55° Diamond type Positive Inserts

DP 55° Diamond type / 11° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✲ Interrupted Cutting 2nd Recommendation

DP■■0702●●

Dimensions (mm)	Cutting Edge Length L	7.7	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FX**	(ap) 2 1 0 P 0.2 0.4 (f)	**DPGT 0702003R-FX**	0.03																																							
			0702003L-FX	0.03																																							
			070201R-FX	0.1																																							
			070201L-FX	0.1																																							
			070202R-FX	0.2																																							
			070202L-FX	0.2																																							
	FY	(ap) 2 1 0 P 0.2 0.4 (f)	**DPGT 0702003R-FY**	0.03																																							
			0702003L-FY	0.03																																							
			070201R-FY	0.1																																							
			070201L-FY	0.1																																							
			070202R-FY	0.2																																							
			070202L-FY	0.2																																							

DP■■11T3●●

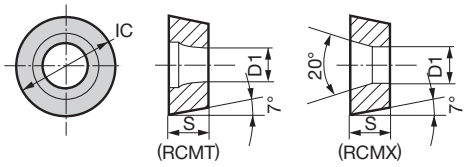
Dimensions (mm)	Cutting Edge Length L	11.6	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

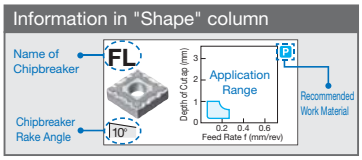
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FX**	(ap) 2 1 0 P 0.2 0.4 (f)	**DPGT 11T3003R-FX**	0.03																																							
			11T3003L-FX	0.03																																							
			11T301R-FX	0.1																																							
			11T301L-FX	0.1																																							
			11T302R-FX	0.2																																							
			11T302L-FX	0.2																																							
	FY	(ap) 2 1 0 P 0.2 0.4 (f)	**DPGT 11T3003R-FY**	0.03																																							
			11T3003L-FY	0.03																																							
			11T301R-FY	0.1																																							
			11T301L-FY	0.1																																							
			11T302R-FY	0.2																																							
			11T302L-FY	0.2																																							

Round type Positive Inserts

RC Round type 7° Pos. With Hole





● Continuous Cutting 1st Recommendation
○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation
◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation
✖ Interrupted Cutting 2nd Recommendation

RC■■●●●●●●

Dimensions (mm)	Inscribed Circle IC	10.0 to 32.0	Thickness S	3.18 to 9.52
	Hole Dia. D1	3.6 to 9.5		

Recommended Application

P	Steel	● ◔ ● ✖ ○ ◔ ✱ ● ◔ ✱ ○ ◔ ◔ ✱ ○ ◔ ✱ ● ◔ ✱ ● ✖ ✱ ● ●
M	Stainless Steel	✱ ✱ ● ✱ ✱ ● ✖ ○ ◔ ✱ ● ✱ ✱ ● ✱
K	Cast Iron	✱ ✱ ● ● ✖ ○ ◔ ✱ ✱ ●
N	Non-Ferrous Metal	●
S	Exotic Alloy	● ● ✖ ◔ ✱ ✱
H	Hardened Steel	●

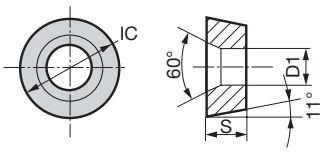
Applicable External Holders ☞C20

	Shape	Application Range	Cat. No.	IC	S	D1	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	CVD: AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium to Roughing	**RX**		RCMT 1003M0N-RX	10.0	3.18	4.4	●	●	●	●	●	●	●					●																											
			1204M0N-RX	12.0	4.76	4.4	●	●	●	●	●	●	●					●																											
			1606M0N-RX	16.0	6.35	5.0	●	●	●	●	●	●	●					●																											
			2006M0N-RX	20.0	6.35	6.5	●	●	●	●	●	●	●					●																											
			2507M0N-RX	25	7.94	7.6	●	●	●	●	●	●	●					●																											
	RH		RCMT 1204M0N-RH	12	4.76	4.4	●	●	●	●	●	●	●					●																											
			1606M0N-RH	16.0	6.35	5.0	●	●	●	●	●	●	●					●																											
			2006M0N-RH	20	6.35	6.5	●	●	●	●	●	●	●					●																											
Roughing	**RP**		RCMX 1003M0N-RP	10.0	3.18	3.6	●	●	●	●	●	●	●					●	●	●	●	▲	▲																	●					
			1204M0N-RP	12	4.76	4.2	●	●	●	●	●	●	●					●	●	●	●	▲	▲		●	●	●	●											●					
			1606M0N-RP	16	6.35	5.2	●	●	●	●	●	●	●					●	●	●	●	▲	▲																	●					
			2006M0N-RP	20.0	6.35	6.5	●	●	●	●	●	●	●					●							●	●	●	●											●					
			2507M0N-RP	25	7.94	7.2	●	●	●	●	●	●	●																															
			3209M0N-RP	32	9.52	9.5	●	●	●		●	●																															

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Round type Positive Inserts

RP Round type 11° Pos. With Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

RP■■●●●●●

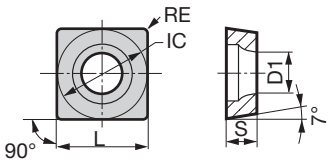
Dimensions (mm)	Inscribed Circle IC	8.0 to 24.0	Thickness S	3.18 to 6.35
	Hole Dia. D1	3.3 to 7.3		

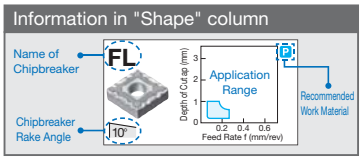
Recommended Application

P	Steel	● ○ ● ✖ ○ ○ ✖ ● ○ ✖ ○ ○ ● ● ✖ ○ ○ ✖ ● ● ✖ ○ ○ ✖ ● ● ✖ ○ ○ ✖

Square type Positive Inserts

SC Square type 7° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

SC■■0702●●

Dimensions (mm)	Cutting Edge Length L	7.94	Thickness S	2.38
	Inscribed Circle IC	7.94	Hole Dia. D1	3.4

SUMIDIA (PCD) Inserts ☞M14
Applicable External Holders ☞D26

Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy, H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M (PVD)	Coated Carbide (CVD) AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	SC 6°	(ap) 4 3 2 1 0 P 0.2 0.4 0.6 (f)	SCMT 070204N-SC	0.4																		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	SC 6°	(ap) 4 3 2 1 0 P 0.2 0.4 0.6 (f)	SCGT 070201MN-SC	< 0.1																		—	—	—	—	—	—	●	●	—	—	—	—	●	●	—	—	—	—	—	—	—	—
			070202MN-SC	< 0.2																		—	—	—	—	—	—	●	●	—	—	—	—	●	●	—	—	—	—	—	—	—	—
			SCGW 070200	0										—								—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			070201	0.1										—								—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

A "<" next to the corner radius RE indicates a negative tolerance.

SC■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.525	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

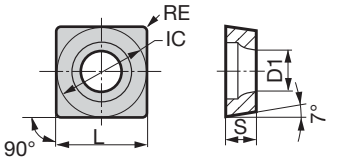
Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy, H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M (PVD)	Coated Carbide (CVD) AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	SC 6°	(ap) 4 3 2 1 0 P 0.2 0.4 0.6 (f)	SCMT 090308N-SC	0.8																		—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	SC 6°	(ap) 4 3 2 1 0 P 0.2 0.4 0.6 (f)	SCGT 090301MN-SC	< 0.1																		—	—	—	—	—	—	●	●	—	—	—	—	●	●	—	—	—	—	—	—	—	—
			090302MN-SC	< 0.2																		—	—	—	—	—	—	●	●	—	—	—	—	●	●	—	—	—	—	—	—	—	—
			SCGW 090300	0										—								—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			090301	0.1										—								—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

A "<" next to the corner radius RE indicates a negative tolerance.

Square type Positive Inserts

SC Square type 7° Pos. With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

SC■■09T3●●

Dimensions (mm)	Cutting Edge Length L	9.525	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application

P	Steel	● ○ ● ✱ ○ ○ ✱ ○ ○ ● ● ✱ ○ ○ ✱ ✱ ● ● ✱ ✱ ● ● ✱ ✱ ● ●
M	Stainless Steel	✱ ✱ ● ● ✱ ✱ ● ● ✱ ○ ○ ✱ ✱ ● ●
K	Cast Iron	✱ ● ● ✱ ○ ○ ✱ ✱ ●
N	Non-Ferrous Metal	●
S	Exotic Alloy	● ● ✱ ○ ✱ ✱
H	Hardened Steel	●

Applicable External Holders D26 Applicable Boring Bars E38

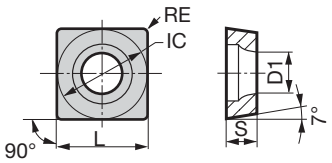
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB**		SCMT 09T304N-FB	0.4																									●		●	●	▲	●	●							
			09T308N-FB	0.8																									●		●	●	▲	●	●							
	LU		SCMT 09T304N-LU	0.4	●	●	●		●	●		●	●			●															●	●	▲	●	●							
			09T308N-LU	0.8	●	●	●		●	●		●	●			●															●	●	▲	●	●							
	FP		SCMT 09T304N-FP	0.4																															●							
			09T308N-FP	0.8																															●							
	FX		SCGT 09T302R-FX	0.2																				●	●				●	●												
			09T302L-FX	0.2																				●	●				●	●												
			09T304R-FX	0.4																				●	●				●	●												
			09T304L-FX	0.4																				●	●				●	●												
Light Cutting	**LB**		SCMT 09T304N-LB	0.4		●	●	●		●	●	●	●																		●	●	▲		●							
			09T308N-LB	0.8		●	●	●		●	●	●	●																		●	●	▲		●							
	SU		SCMT 09T304N-SU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●							●	●	●																	
			09T308N-SU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●							●	●	●																	
	SC		SCGT 09T301MN-SC	< 0.1																									●	●				●	●							
			09T302MN-SC	< 0.2																									●	●				●	●							
			SCMW 09T308	0.8													●	●	●	▲	▲																					
			SCGW 09T300	0																																						
			09T301	0.1																																						
Light to Medium Cutting	**GU**		SCMT 09T304N-GU	0.4	●	●	●	●				●	●	●																												
			09T308N-GU	0.8	●	●	●	●				●	●	●																												
	MU		SCMT 09T308N-MU	0.8	●	●	●		●	●		●	●			●	●	●	●	▲	▲																					

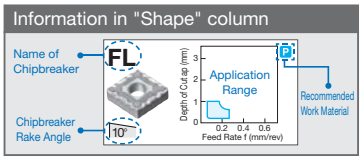
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Positive Inserts

SC Square type 7° Pos. With Hole





● Continuous Cutting 1st Recommendation
○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation
◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation
✖ Interrupted Cutting 2nd Recommendation

SC■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.5

Applicable Boring Bars ☞ E38

Recommended Application

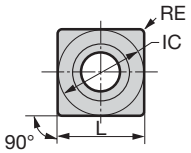
P	Steel	● ◔ ● ✖ ○ ◔ ✖ ✖ ◔ ● ✖ ○ ◔ ● ● ◔ ✖ ✖ ✖ ● ✖ ✖ ● ●
M	Stainless Steel	✖ ✖ ✖ ✖ ✖ ✖ ● ● ✖ ○ ◔ ● ● ✖ ○ ◔ ✖ ✖ ● ✖ ✖ ✖
K	Cast Iron	✖ ✖ ● ● ✖ ✖ ● ✖ ○ ◔ ✖ ✖ ✖ ● ✖ ✖ ●
N	Non-Ferrous Metal	●
S	Exotic Alloy	● ● ✖ ◔ ✖ ✖
H	Hardened Steel	●

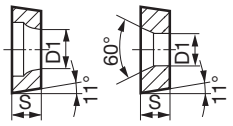
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide: PVD: AC6040M	AC610M	AC630M	Coated Carbide: CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide: PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	Cemented Carbide: T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FP 10°		SCMT 120404N-FP	0.4																															●							
			120408N-FP	0.8																															●							
	FX 15°		SCGT 120404R-FX	0.4																				●	●				●	●												
			120404L-FX	0.4																				●	●				●	●												
			120408R-FX	0.8																																						
			120408L-FX	0.8																																						
Light Cutting	SU 8°		SCMT 120404N-SU	0.4	●	●	●	●	●	●	●																														
			120408N-SU	0.8	●	●	●	●	●	●	●																														
	SC 6°		SCMT 120408N-SC	0.8																																					
			SCMW 120408	0.8													●	●	●	▲	▲																				
			120412	1.2													●	●	●	▲	▲																				
Light to Medium Cutting	GU 5°		SCMT 120408N-GU	0.8	●	●	●	●																																	
	MU 0°		SCMT 120408N-MU	0.8	●	●	●		●	●						●	●	●	●	▲	▲																				
			120412N-MU	1.2																																					

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Positive Inserts

SP Square type 11° Pos. With Hole





(USType, SSType to SP□□07)

Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

SP■■0602●●

Dimensions (mm)	Cutting Edge Length L	6.35	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	Coated Carbide (PVD) AC6030M	AC6040M	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	US 10°	(ap) 2 1 0 0.2 0.4 (f) P	SPMT 060204N-US	0.4												●						—									—	—	—	—	—			●					—

SP■■0702●●

Dimensions (mm)	Cutting Edge Length L	7.94	Thickness S	2.38
	Inscribed Circle IC	7.94	Hole Dia. D1	3.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	Coated Carbide (PVD) AC6030M	AC6040M	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	SS 5°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	SPMT 070208N-SS	0.8			●									●		●				—									—	—	—	—	—			●					—

SP■■0703●●

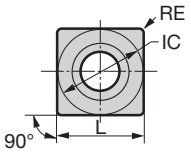
Dimensions (mm)	Cutting Edge Length L	7.94	Thickness S	3.18
	Inscribed Circle IC	7.94	Hole Dia. D1	3.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

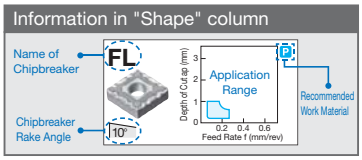
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	Coated Carbide (PVD) AC6030M	AC6040M	AC610M	AC630M	Coated Carbide (CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing to Light Cutting	SD 0°	(ap) 2 1 0 0.2 0.4 (f) P	SPGT 070304R-SD	0.4																																	●		●			
			070304L-SD	0.4																																	●		●			
			070308R-SD	0.8																																						
			070308L-SD	0.8																																						
Light Cutting	US 10°	(ap) 2 1 0 0.2 0.4 (f) P	SPMT 070308N-US	0.8			●									●		●				—									—	—	—	—	—			●					—
			SPGW 070304	0.4														●																					●			●
			070308	0.8														●																					●			●

Square type Positive Inserts

SP Square type 11° Pos. With Hole



(US type, SS type to SP□□07)



● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SP■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.525	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	3.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIDIA (PCD) Inserts ☞M14

Applicable Boring Bars ☞E36

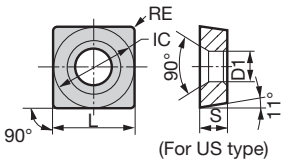
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	CVD: AC6040M	PVD: AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB** 20°	(ap) 2 1 0 0.2 0.4 (f) P	**SPMT 090304N-FB**	0.4																								●		●	●	▲	●	●							
			090308N-FB	0.8																								●		●	●	▲	●	●							
	LU 15°	(ap) 2 1 0 0.2 0.4 (f) P	**SPMT 090304N-LU**	0.4	●	●	●		●	●		●	●			●														●	▲	●	●							
			090308N-LU	0.8	●	●	●		●	●		●	●			●														●	▲	●	●							
Finishing to Light Cutting	**SD** 0°	(ap) 2 1 0 0.2 0.4 (f) P	**SPGT 090302R-SD**	0.2																										●			●	●							
			090302L-SD	0.2																										●			●	●							
			090304R-SD	0.4																										●			●	●					●		
			090304L-SD	0.4																										●	●	▲	●	●					●		
			090308R-SD	0.8																										●			●	●							
			090308L-SD	0.8																										●	●	▲	●	●					●		
Light Cutting	**LB** 15°	(ap) 2 1 0 0.2 0.4 (f) P	**SPMT 090304N-LB**	0.4		●	●	●		●	●	●	●	●				●												●	●	▲		●							
			090308N-LB	0.8		●	●	●		●	●	●	●	●				●												●	●	▲		●							
	SS 5° *1	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**SPMH 090308N-SS**	0.8												●																				●					
	US 10° *1	(ap) 2 1 0 0.2 0.4 (f) P	**SPMH 090308N-US**	0.8												●																				●					
			SPGW 090300	0																																					
			090304	0.4														●																					●		●
			090308 New	0.8														●																							●
Light to Medium Cutting	**SF** 0° *2	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**SPMT 090304N-SF**	0.4			●	●		●	●																													
			090308N-SF	0.8			●	●		●	●																													

*1: Hole Dia. D1=4.4.
*2: Hole Dia. D1=3.3.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Positive Inserts

SP Square type 11° Pos. With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

SP■■09T3●●

Dimensions (mm)	Cutting Edge Length L	9.525	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
P Steel	Light Cutting	US		SPMT 09T308N-US	0.8											●																											
M Stainless Steel																																										
K Cast Iron																																										
N Non-Ferrous Metal																																										
S Exotic Alloy																																										
H Hardened Steel																																										

SP■■1204●●

Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	4.76
	Inscribed Circle IC	12.7	Hole Dia. D1	5.5

Recommended Application	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
P Steel	Light Cutting	US		SPMH 120408N-US	0.8											●																											
M Stainless Steel																																										
K Cast Iron																																										
N Non-Ferrous Metal																																										
S Exotic Alloy																																										
H Hardened Steel																																										

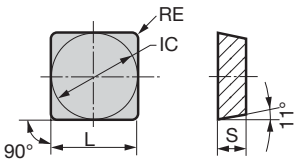
SP■■1504●●

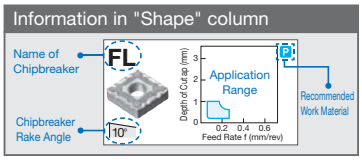
Dimensions (mm)	Cutting Edge Length L	15.875	Thickness S	4.76
	Inscribed Circle IC	15.875	Hole Dia. D1	6.5

Recommended Application	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
P Steel	Light Cutting	US		SPMH 150408N-US	0.8											●																											
M Stainless Steel																																										
K Cast Iron																																										
N Non-Ferrous Metal																																										
S Exotic Alloy																																										
H Hardened Steel																																										

Square type Positive Inserts

SP Square type 11° Pos. Without Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

SP■■0702●●

Dimensions (mm)	Cutting Edge Length L	7.94	Thickness S	2.38
	Inscribed Circle IC	7.94		

Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy, H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide PVD AC6040M	AC610M	Coated Carbide CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing to Light Cutting	W		SPGR 070204L-W	0.4																																●							
Light Cutting			SPGN 070204	0.4																																								●

SP■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.525	Thickness S	3.18
	Inscribed Circle IC	9.525		

SUMIBORON (CBN) Inserts L78 SUMIDIA (PCD) Inserts M14
Ceramic Inserts B128
Applicable Boring Bars E37

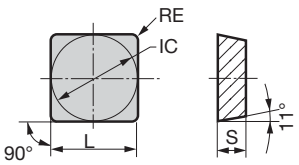
Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy, H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide PVD AC6040M	AC610M	Coated Carbide CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FK		SPMR 090304N-FK	0.4																										●			●	●								
			090308N-FK	0.8																										●	●	▲	●	●								
Finishing to Light Cutting	W		SPGR 090304L-W	0.4																																●							
Light to Medium Cutting	SF		SPMR 090304N-SF	0.4			●	●		●	●																															
			090308N-SF	0.8			●	●		●	●																															
	UJ		SPMR 090304N-UJ	0.4			●			●																																
			090308N-UJ	0.8			●	●		●	●																															
Medium Cutting			SPMN 090304	0.4													●	●	●	▲	▲														●	●		●				
			090308	0.8													●	●	●	▲	▲														●	●		●				
			SPGN 090302	0.2																																						
			090304	0.4																															●	●						
			090308	0.8																						●	●	●							●	●			●			●
			090312	1.2																																						

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Square type Positive Inserts

SP Square type 11° Pos. Without Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SP■■1203●●

Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	3.18
	Inscribed Circle IC	12.7		

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞ L79 SUMIDIA (PCD) Inserts ☞ M14
Ceramic Inserts ☞ B128 Applicable External Holders ☞ C27, C28

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FK 0°	(ap) 2 1 0 0.2 0.4 (f) P	SPMR 120304N-FK	0.4																										●	●		●	●								
			120308N-FK	0.8																										●	●		●	●								
Light to Medium Cutting	SF 0°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	SPMR 120304N-SF	0.4			●●			●●																															
			120308N-SF	0.8			●●			●●																															
			120312N-SF	1.2			●			●																															
	UJ 0°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	SPMR 120304N-UJ	0.4			●			●																															
			120308N-UJ	0.8			●●			●●																															
Medium Cutting			SPMN 120304	0.4													●▲	●▲	●▲	●▲	●▲		●●	●●	●●	●●									●●	●●	●●	●●	●		●			
			120308	0.8													●▲	●▲	●▲	●▲	●▲		●●	●●	●●	●●									●●	●●	●●	●●	●		●			
			120312	1.2													●▲	●▲	●▲	●▲	●▲		●●	●●	●●	●●				●					●●	●●		●●	●		●			
			SPGN 120304	0.4																			●●	●●	●●									●●	●●				●			
			120308	0.8																			●●	●●	●●									●●	●●				●			
			120312	1.2																																		●				

SP■■1204●●

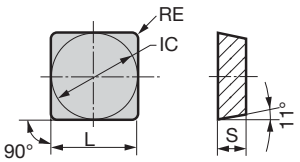
Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	4.76
	Inscribed Circle IC	12.7		

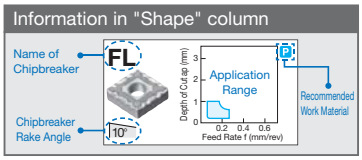
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			SPGN 120408	0.8																																					
			120412	1.2																																					
			120416	1.6																																					

Square type Positive Inserts

SP Square type 11° Pos. Without Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

SP□□1504●●

Dimensions (mm)	Cutting Edge Length L	15.875	Thickness S	4.76
	Inscribed Circle IC	15.875		

Applicable External Holders ☞C27, C28

	Shape	Application Range	Cat. No.	Corner Radius RE
Medium Cutting			**SPMN 150408**	0.8
			150412	1.2
			SPGN 150408	0.8
			150412	1.2

Recommended Application		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
		Coated Carbide																													Coated Cermet		Cermet	Cemented Carbide					
		CVD										PVD	CVD						PVD												PVD									
P	Steel	●	◔	●	✖	○	◔	✖		◔			◔							✖	✖	✖		✖	✖	✖		✖	✖	✖	●	●							
M	Stainless Steel				✖			✖	●	●	✖	○	◔							✖	✖	✖		✖	✖	✖		✖	✖	✖									
K	Cast Iron			✖			✖							●	●	✖	○	◔							✖						●								
N	Non-Ferrous Metal																																					●
S	Exotic Alloy																		●	●	●	✖	◔	✖	✖	✖												
H	Hardened Steel																		●																			

SP□□1904●●

Dimensions (mm)	Cutting Edge Length L	19.05	Thickness S	4.76
	Inscribed Circle IC	19.05		

	Shape	Application Range	Cat. No.	Corner Radius RE
Medium Cutting			**SPMN 190404**	0.4
			190408	0.8
			190412	1.2
			SPGN 190404	0.4
			190408	0.8
			190412	1.2
			190416	1.6

Recommended Application		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
		Coated Carbide																													Coated Cermet		Cermet	Cemented Carbide					
		CVD										PVD	CVD						PVD												PVD									
P	Steel	●	◔	●	✖	○	◔	✖		◔			◔							✖	✖	✖		✖	✖	✖		✖	✖	✖	●	●							
M	Stainless Steel				✖			✖	●	●	✖	○	◔							✖	✖	✖		✖	✖	✖		✖	✖	✖									
K	Cast Iron			✖			✖							●	●	✖	○	◔							✖						●								
N	Non-Ferrous Metal																																					●
S	Exotic Alloy																		●	●	●	✖	◔	✖	✖	✖												
H	Hardened Steel																		●																			

SP□□2506●●

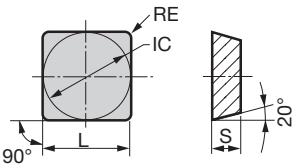
Dimensions (mm)	Cutting Edge Length L	25.4	Thickness S	6.35
	Inscribed Circle IC	25.4		

	Shape	Application Range	Cat. No.	Corner Radius RE
Medium Cutting			**SPMN 250620**	2.0

Recommended Application		AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
		Coated Carbide																													Coated Cermet		Cermet	Cemented Carbide					
		CVD										PVD	CVD						PVD												PVD									
P	Steel	●	◔	●	✖	○	◔	✖		◔			◔							✖	✖	✖		✖	✖	✖		✖	✖	✖	●	●							
M	Stainless Steel				✖			✖	●	●	✖	○	◔							✖	✖	✖		✖	✖	✖		✖	✖	✖									
K	Cast Iron			✖			✖							●	●	✖	○	◔							✖						●								
N	Non-Ferrous Metal																																					●
S	Exotic Alloy																		●	●	●	✖	◔	✖	✖	✖												
H	Hardened Steel																		●																			

Square type Positive Inserts

SE Square type 20° Pos. Without Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

SE■■0702●●

Dimensions (mm)	Cutting Edge Length L	7.94	Thickness S	2.38
	Inscribed Circle IC	7.94		

	Shape	Application Range	Cat. No.	Corner Radius RE
Light Cutting			**SEGN 070202** **070204** **070208**	0.2 0.4 0.8

SE■■0903●●

Dimensions (mm)	Cutting Edge Length L	9.525	Thickness S	3.18
	Inscribed Circle IC	9.525		

SUMIDIA (PCD) Inserts M15

	Shape	Application Range	Cat. No.	Corner Radius RE
Light Cutting			**SEGN 090302** **090304** **090308**	0.2 0.4 0.8

SE■■1203●●

Dimensions (mm)	Cutting Edge Length L	12.7	Thickness S	3.18
	Inscribed Circle IC	12.7		

SUMIDIA (PCD) Inserts M15

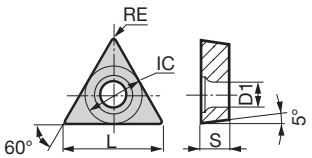
	Shape	Application Range	Cat. No.	Corner Radius RE
Light Cutting			**SEGN 120304** **120308**	0.4 0.8

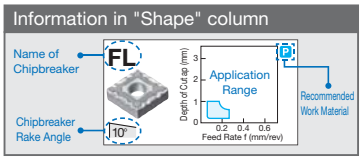
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Coated Carbide (CVD: AC8015P, AC8020P, AC8025P, AC8035P, AC810P, AC820P, AC830P, AC6020M, AC6030M, AC6040M; PVD: AC610M, AC630M, AC4010K, AC4015K, AC420K, AC405K, AC415K, AC503U, AC5005S, AC5015S, AC5025S, AC510U, AC520U, AC1030U, AC530U, ACZ150) | Coated Cermet (PVD: T1500Z, T2500Z, T3000Z) | Cermet (T1000A, T1500A) | Cemented Carbide (ST10P, ST20E, A30, G10E, EH510, EH520, H1)

Triangular type Positive Inserts

TB Triangular type 5° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

TB■■0601●●

Dimensions (mm)	Cutting Edge Length L	6.9	Thickness S	1.59
	Inscribed Circle IC	3.97	Hole Dia. D1	2.2

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

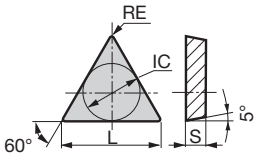
SUMIBORON (CBN) Inserts L87 SUMIDIA (PCD) Inserts M16
Applicable Boring Bars E42, E44

					Coated Carbide																											Coated Cermet			Cermet	Cemented Carbide						
					CVD							PVD		CVD						PVD													PVD									
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FW**		TBGT 060102R-FW	0.2																																					
			060102L-FW	0.2																																					
			060104R-FW	0.4																																					
			060104L-FW	0.4																																					
	FX		TBGT 0601003R-FX	0.03																																					
			0601003L-FX	0.03																																					
			060101R-FX	0.1																																					
			060101L-FX	0.1																																					
			060102R-FX	0.2																			●	●	●		●	●													
			060102L-FX	0.2																			●	●	●		●	●													
			060104R-FX	0.4																			●	●	●		●	●													
			060104L-FX	0.4																			●	●	●		●	●													
	FY		TBGT 0601003R-FY	0.03																																					
			0601003L-FY	0.03																																					
			060101R-FY	0.1																				●	●			●	●													
			060101L-FY	0.1																				●	●			●	●													
			060102R-FY	0.2																				●	●			●	●						●	●							
			060102L-FY	0.2																				●	●			●	●						●	●							
			060104R-FY	0.4																				●	●			●	●						●	●							
			060104L-FY	0.4																				●	●			●	●						●	●							
Finishing to Light Cutting	**W**		TBGT 060102R-W	0.2																								●	●		●	●	▲	●	●			●				
			060102L-W	0.2																								●	●		●	●		●	●			●				
			060104R-W	0.4																								●	●		●	●		●	●			●				
			060104L-W	0.4																								●	●		●	●		●	●			●				
Light Cutting			TBGW 060102	0.2																															●							
			060104	0.4																															●							
For Aluminum	**AY**		TBGT 060101R-AY	0.1																																					●
			060101L-AY	0.1																																					●
			060102R-AY	0.2																																					●
			060102L-AY	0.2																																					●
			060104R-AY	0.4																																					●
			060104L-AY	0.4																																					●

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TB Triangular type 5° Pos. Without Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TB■■0601●●

Dimensions (mm)	Cutting Edge Length L	6.9	Thickness S	1.59
	Inscribed Circle IC	3.97		

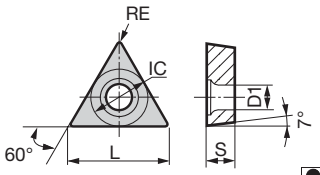
Recommended Application

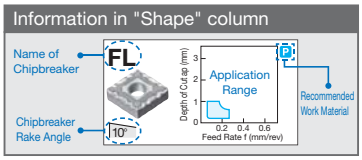
		Coated Carbide																				Coated Cermet		Cermet	Cemented Carbide						
		CVD								PVD	CVD					PVD						PVD									
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing to Light Cutting	W	(ap) 2 1 0 0.2 0.4 (f) P	TBGR 060104L-W	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	—
Light Cutting			TBGN 060104	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●	—	—	—	—	—	—	●

SUMIBORON (CBN) Inserts L87
SUMIDIA (PCD) Inserts M16

Triangular type Positive Inserts

TC Triangular type 7° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TC■■0802●●

Dimensions (mm)	Cutting Edge Length L	8.2	Thickness S	2.38
	Inscribed Circle IC	4.76	Hole Dia. D1	2.3

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	Coated Carbide (CVD) AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	SC		TCGT 080201MN-SC	< 0.1																								●	●						●	●							
	6°		080202MN-SC	< 0.2																								●	●						●	●							
			TCGW 080200	0																																							
			080201	0.1																																							

A "<" next to the corner radius RE indicates a negative tolerance.

TC■■0902●●

Dimensions (mm)	Cutting Edge Length L	9.6	Thickness S	2.38
	Inscribed Circle IC	5.56	Hole Dia. D1	2.5

SUMIDIA (PCD) Inserts ☞M16
Applicable External Holders ☞D27

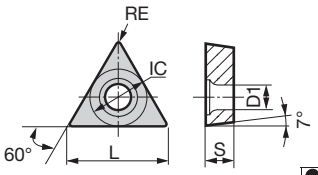
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	Coated Carbide (CVD) AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FX		TCGT 090201R-FX	0.1																				●	●			●	●													
	15°		090201L-FX	0.1																				●	●			●	●													
			090202R-FX	0.2																				●	●			●	●													
			090202L-FX	0.2																				●	●			●	●													
	FY		TCGT 090201R-FY	0.1																				●	●			●	●													
	15°		090201L-FY	0.1																				●	●			●	●													
			090202R-FY	0.2																				●	●			●	●													
			090202L-FY	0.2																				●	●			●	●													
Light Cutting	SC		TCGT 090201MN-SC	< 0.1																								●	●						●	●							
	6°		090202MN-SC	< 0.2																								●	●						●	●							
			TCGW 090200	0																																							
			090201	0.1																																							

A "<" next to the corner radius RE indicates a negative tolerance.

Triangular type Positive Inserts

TC Triangular type 7° Pos. With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

TC■■1102●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIDIA (PCD) Inserts M16
Applicable External Holders D27

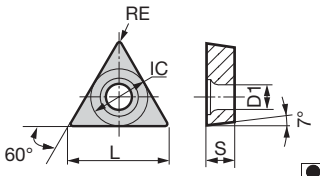
					Coated Carbide																										Coated Cermet			Cermet		Cemented Carbide						
					CVD						PVD		CVD					PVD														PVD										
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FF		TCGT 110201MN-FF New	< 0.1																		●	●	●			●														
	15°		110202MN-FF New	< 0.2																		●	●	●			●														
			110204MN-FF New	< 0.4																		●	●	●			●														
Finishing	FB		TCMT 110204N-FB	0.4																								●			●	●	▲	●	●						
	20°		110208N-FB	0.8																								●			●	●	▲	●	●						
	LU		TCMT 110204N-LU	0.4	●	●	●		●	●			●	●		●															●	●	▲	●	●						
	15°		110208N-LU	0.8	●	●	●		●	●			●	●		●															●	●	▲	●	●						
	FP		TCMT 110204N-FP	0.4																														●							
	10°		110208N-FP	0.8																														●							
	FX		TCGT 110201R-FX	0.1																			●	●			●	●													
	15°		110201L-FX	0.1																			●	●			●	●													
			110202R-FX	0.2																			●	●			●	●													
			110202L-FX	0.2																			●	●			●	●													
	FY		TCGT 110201R-FY	0.1																			●	●			●	●													
	15°		110201L-FY	0.1																			●	●			●	●													
			110202R-FY	0.2																			●	●			●	●													
			110202L-FY	0.2																			●	●			●	●													
Light Cutting	LB		TCMT 110204N-LB	0.4		●	●	●		●	●	●	●	●																	●	●	▲		●						
	15°		110208N-LB	0.8		●	●	●		●	●	●	●	●																	●	●	▲		●						
	SU		TCMT 110204N-SU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●						●	●	●		●		●				●									
	8°		110208N-SU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●						●	●	●		●		●													
	SI		TCGT 110201MN-SI New	< 0.1																			●	●			●													
	15°		110202MN-SI New	< 0.2																			●	●			●													
			110204MN-SI	< 0.4											▲	●							●	●	●	●	●	●			●	●		●	●						
	SC		TCGT 110201MN-SC	< 0.1																								●	●					●	●						
	6°		110202MN-SC	< 0.2																								●	●					●	●						
			TCMW 110204	0.4													●	●	●	▲	▲																				
			110208	0.8													●	●	●	▲	▲																				
			TCGW 110200	0																																					
			110201	0.1																																					

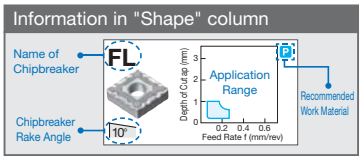
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TC Triangular type 7° Pos. With Hole





● Continuous Cutting 1st Recommendation
○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation
◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation
✖ Interrupted Cutting 2nd Recommendation

TC■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	CVD: AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FX		TCGT 110301R-FX	0.1																															●	●							
			110301L-FX	0.1																															●	●							
			110302R-FX	0.2																															●	●							
			110302L-FX	0.2																															●	●							
			110304R-FX	0.4																															●	●							
			110304L-FX	0.4																															●	●							
Light Cutting	SC		TCGT 110301MN-SC	< 0.1																															●	●							
			110302MN-SC	< 0.2																															●	●							
			TCGW 110300	0																																							
			110301	0.1																																							

A "<" next to the corner radius RE indicates a negative tolerance.

TC■■16T3●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	3.97
	Inscribed Circle IC	9.525	Hole Dia. D1	4.3

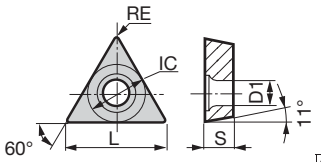
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	CVD: AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FP		TCMT 16T304N-FP	0.4																															●							
			16T308N-FP	0.8																															●							
Light Cutting	SU		TCMT 16T304N-SU	0.4	●	●	●	●	●	●	●	●	●	▲	●							—	●	●	●																	
			16T308N-SU	0.8	●	●	●	●	●	●	●	●	●	▲	●							—	●	●	●																	
			TCMW 16T304	0.4												●	●	●	▲	▲																							
			16T308	0.8												●	●	●	▲	▲																							
			16T312	1.2												●	●	●	▲	▲																							

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TP Triangular type 11° Pos. With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

Continuous Cutting 1st Recommendation / Continuous Cutting 2nd Recommendation
General Machining 1st Recommendation / General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TP■■0802●●

Dimensions (mm)	Cutting Edge Length L	8.2	Thickness S	2.38
	Inscribed Circle IC	4.76	Hole Dia. D1	2.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

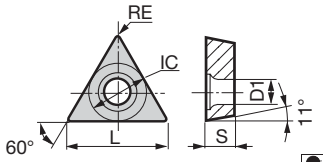
SUMIBORON (CBN) Inserts L88 | SUMIDIA (PCD) Inserts M17
SUMIDIA BINDERLESS Inserts M28 | Applicable Boring Bars E42 to E45

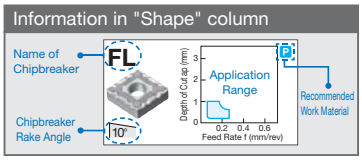
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	CVD AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FF		TPGT 080201MN-FF New	< 0.1																				●	●			●															
			080202MN-FF New	< 0.2																				●	●			●															
			080204MN-FF New	< 0.4																				●	●			●															
Finishing	FB		TPMT 080202N-FB	0.2																									●			●	●	▲	●	●							
			080204N-FB	0.4																									●			●	●	▲	●	●							
	LU		TPMT 080202N-LU	0.2									●	●		●													●						●	●							
			080204N-LU	0.4			●						●	●		●		●											●				●		●	●							
	FW		TPGT 080202R-FW	0.2																												●			●	●							
			080202L-FW	0.2																												●			●	●							
			080204R-FW	0.4																												●			●	●							
			080204L-FW	0.4																												●	●		●	●							
	FX		TPGT 080202R-FX	0.2																				●	●			●	●	●												
			080202L-FX	0.2																				●	●			●	●	●												
			080204R-FX	0.4																				●	●			●	●	●												
			080204L-FX	0.4																				●	●			●	●	●												
	FY		TPGT 0802003R-FY	0.03																				●	●			●	●	●	●											
			0802003L-FY	0.03																				●	●			●	●	●	●											
			080201R-FY	0.1																				●	●			●	●	●	●											
			080201L-FY	0.1																				●	●			●	●	●	●											
			080202R-FY	0.2																				●	●			●	●	●	●				●	●						
			080202L-FY	0.2																				●	●			●	●	●	●				●	●						
			080204R-FY	0.4																				●	●			●	●	●	●				●	●						
			080204L-FY	0.4																				●	●			●	●	●	●				●	●						
Finishing to Light Cutting	W		TPGT 080202R-W	0.2																									●	●		●	●	▲	●	●				●			
			080202L-W	0.2																									●	●		●	●	▲	●	●	●			●			
			080204R-W	0.4																									●	●		●			●	●							
			080204L-W	0.4																									●	●		●	●	▲	●	●				●			
Light Cutting	LB		TPMT 080202N-LB	0.2		●	●	●		●	●	●	●	●																		●	●	▲		●						
			080204N-LB	0.4		●	●	●		●	●	●	●	●																		●	●	▲		●						
	SU		TPMT 080202N-SU	0.2								●	●	●		●							●	●	●				●						●	●							
			080204N-SU	0.4			●					●	●	●		●		●					●	●	●				●						●	●							
	SI		TPGT 080201MN-SI New	< 0.1																				●	●			●															
			080202MN-SI New	< 0.2																				●	●			●															
			080204MN-SI New	< 0.4																				●	●			●															
			TPGW 080202	0.2																															●	●							
			080204	0.4														●																	●	●							●
			080208 New	0.8														●																	●	●							●

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TP Triangular type 11° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TP■■0802●●

Dimensions (mm)	Cutting Edge Length L	8.2	Thickness S	2.38
	Inscribed Circle IC	4.76	Hole Dia. D1	2.4

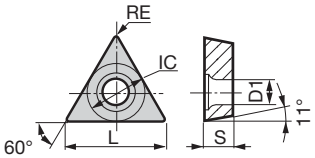
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞L88 SUMIDIA (PCD) Inserts ☞M17
SUMIDIA BINDERLESS Inserts ☞M28 Applicable Boring Bars ☞E42 to E45

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	Coated Carbide (PVD) AC6040M	AC610M	Coated Carbide (CVD) AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	Coated Carbide (PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
For Aluminum	AY		TPGT 080201R-AY	0.1																																							●
			080201L-AY	0.1																																							●
			080202R-AY	0.2																																							●
			080202L-AY	0.2																																							●
			080204R-AY	0.4																																							●
			080204L-AY	0.4																																							●

Triangular type Positive Inserts

TP Triangular type / 11° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

TP■■0902●●

Dimensions (mm)	Cutting Edge Length L	9.6	Thickness S	2.38
	Inscribed Circle IC	5.56	Hole Dia. D1	2.8

Recommended Application: P Steel / M Stainless Steel / K Cast Iron / N Non-Ferrous Metal / S Exotic Alloy / H Hardened Steel

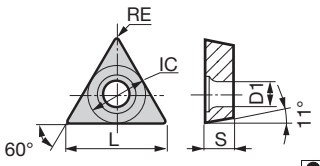
SUMIBORON (CBN) Inserts L90
SUMIDIA (PCD) Inserts M17
Applicable Boring Bars E42

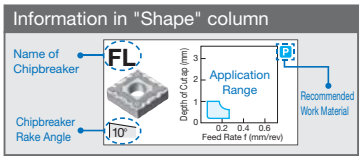
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB**	P	TPMT 090202N-FB	0.2																									●		●	●	▲	●	●								
	20°		090204N-FB	0.4																									●		●	●	▲	●	●								
	LU	P	TPMT 090202N-LU	0.2	●	●	●			●																					●	●	▲	●	●								
	15°		090204N-LU	0.4	●	●	●			●																					●	●	▲	●	●								
	FX	P	TPGT 090204L-FX	0.4																														●	●								
	15°																																									
	FY	P	TPGT 090201R-FY	0.1																			●	●			●																
	15°		090201L-FY	0.1																			●	●			●																
			090202R-FY	0.2																			●	●			●								●								
			090202L-FY	0.2																			●	●			●								●								
			090204R-FY	0.4																			●	●			●								●								
			090204L-FY	0.4																			●	●			●								●								
Light Cutting	**LB**	P	TPMT 090202N-LB	0.2		●	●	●		●	●	●	●	●																	●	●	▲		●								
	15°		090204N-LB	0.4		●	●	●		●	●	●	●	●				●													●	●	▲		●								
	SU	P	TPMT 090204N-SU	0.4																			●	●	●																		
	8°																																									
			TPGW 090204 New	0.4														●																										
			090208 New	0.8														●																										
For Aluminum	**AY**	N	TPGT 090201R-AY	0.1																																							●
	15°		090201L-AY	0.1																																							●
			090202R-AY	0.2																																							●
			090202L-AY	0.2																																							●
			090204R-AY	0.4																																							●
			090204L-AY	0.4																																							●

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TP Triangular type 11° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TP■■1102●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application

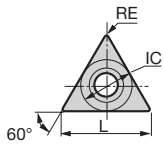
P	Steel
M	Stainless Steel
K	Cast Iron
N	Non-Ferrous Metal
S	Exotic Alloy
H	Hardened Steel

SUMIBORON (CBN) Inserts ☞L92 SUMIDIA (PCD) Inserts ☞M18
Applicable Boring Bars ☞E42

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	CVD AC8020P	CVD AC8025P	CVD AC8035P	CVD AC810P	CVD AC820P	CVD AC830P	CVD AC6020M	CVD AC6030M	PVD AC6040M	PVD AC610M	CVD AC630M	CVD AC4010K	CVD AC4015K	CVD AC420K	CVD AC405K	CVD AC415K	PVD AC503U	PVD AC5005S	PVD AC5015S	PVD AC5025S	PVD AC510U	PVD AC520U	PVD AC1030U	PVD AC530U	PVD ACZ150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	Cemented Carbide T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FW**	P	TPGT 110202R-FW	0.2																										●	●	●	●	●							
			110202L-FW	0.2																										●	●	●	●	●							
			110204R-FW	0.4																										●	●	●	●	●							
			110204L-FW	0.4																										●	●	●	●	●							
	FX	P	TPGT 110202R-FX	0.2																				●	●	●															
			110202L-FX	0.2																				●	●	●															
			110204R-FX	0.4																				●	●	●															
			110204L-FX	0.4																				●	●	●															
			110208R-FX	0.8																				●	●	●															
			110208L-FX	0.8																				●	●	●															
	FY	P	TPGT 110202R-FY	0.2																													●	●							
			110202L-FY	0.2																													●	●							
			110204R-FY	0.4																													●	●							
			110204L-FY	0.4																													●	●							
			110208R-FY	0.8																														●							
			110208L-FY	0.8																														●							
For Aluminum	**AY**	N	TPGT 110202R-AY	0.2																																					●
			110202L-AY	0.2																																					●
			110204R-AY	0.4																																					●
			110204L-AY	0.4																																					●

Triangular type Positive Inserts

TP Triangular type / 11° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

TP■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	3.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L93 on
SUMIDIA (PCD) Inserts M19
SUMIDIA BINDERLESS Inserts M28
Applicable Boring Bars E14, E42 to E46

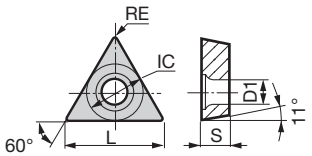
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB** 20°	(ap) 2 1 0 0.2 0.4 (f) P	TPMT 110302N-FB	0.2																									●		●	▲	●								
			110304N-FB	0.4																									●		●	▲	●								
			110308N-FB	0.8																									●		●	▲	●								
	LU 15°	(ap) 2 1 0 0.2 0.4 (f) P	TPMT 110302N-LU	0.2										●															●		●	●		●							
			110304N-LU	0.4	●	●	●		●	●			●	●		●													●		●	●	▲	●							
			110308N-LU	0.8	●	●	●		●	●			●	●		●													●		●	●	▲	●							
	FK 0°	(ap) 2 1 0 0.2 0.4 (f) P	TPMT 110308N-FK	0.8																													●	●							
	FC 15°	(ap) 2 1 0 0.2 0.4 (f) P	TPGT 110302MN-FC	< 0.2																			●	●			●	●	●				●	●							
			110304MN-FC	< 0.4																			●	●			●	●	●				●	●							
	FX 15°	(ap) 2 1 0 0.2 0.4 (f) P	TPGT 110302R-FX	0.2																			●	●			●	●	●												
			110302L-FX	0.2																			●	●			●	●	●												
			110304R-FX	0.4																			●	●			●	●	●												
			110304L-FX	0.4																			●	●			●	●	●												
			110308R-FX	0.8																			●	●			●	●	●												
			110308L-FX	0.8																			●	●			●	●	●												
	FY 15°	(ap) 2 1 0 0.2 0.4 (f) P	TPGT 1103003R-FY	0.03																			●	●			●	●	●	●											
			1103003L-FY	0.03																			●	●			●	●	●	●											
			110301R-FY	0.1																			●	●			●	●	●	●											
			110301L-FY	0.1																			●	●			●	●	●	●											
			110302R-FY	0.2																			●	●			●	●	●	●	●				●	●					
			110302L-FY	0.2																			●	●			●	●	●	●	●		●	▲	●	●					
			110304R-FY	0.4																			●	●			●	●	●	●	●				●	●					
			110304L-FY	0.4																			●	●			●	●	●	●	●		●	▲	●	●					
			110308R-FY	0.8																			●	●			●	●	●							●					
			110308L-FY	0.8																			●	●			●	●	●							●					
Finishing to Light Cutting	**SD** 0°	(ap) 2 1 0 0.2 0.4 (f) P	TPGT 110302R-SD	0.2																								●	●		●			●	●					
			110302L-SD	0.2																								●	●		●	●	▲	●	●			●		
			110304R-SD	0.4																								●	●		●	●	▲	●	●			●		
			110304L-SD	0.4																								●	●		●	●	▲	●	●	●		●		
			110308R-SD	0.8																								●	●		●			●	●					
			110308L-SD	0.8																								●	●		●	●	▲	●	●			●		
	SDW 0° → B131 Wiper	(ap) 2 1 0 0.2 0.4 (f) P	TPGX 110304R-SDW	0.4																												●	▲							
			110304L-SDW	0.4																												●	▲							
			110308R-SDW	0.8																												●	▲							
			110308L-SDW	0.8																												●	▲							

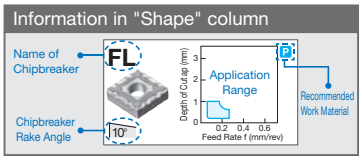
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TP Triangular type 11° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

TP■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	3.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

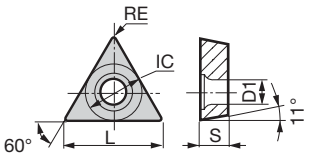
SUMIBORON (CBN) Inserts ☞L93 on
SUMIDIA (PCD) Inserts ☞M19
SUMIDIA BINDERLESS Inserts ☞M28
Applicable Boring Bars ☞E14, E42 to E46

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	Coated Cermet AC530U	AC2150	PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	**LB** 15°	(ap) 2 1 0 0.2 0.4 (f) P	TPMT 110302N-LB	0.2	●	●	●		●	●	●	●	●																					●							
			110304N-LB	0.4	●	●	●		●	●	●	●	●																					●							
			110308N-LB	0.8	●	●	●		●	●	●	●	●																					●							
	SU 8°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	TPMT 110302N-SU	0.2	●	●	●	●		●	●	●	●	▲	●						●	●	●					●			●	●		●	●						
			110304N-SU	0.4	●	●	●	●	●	●	●	●	●	▲	●		●				●	●	●					●			●	●	▲	●	●						
			110308N-SU	0.8	●	●	●	●	●	●	●	●	●	▲	●						●	●	●					●			●	●	▲	●	●						
			TPGW 110302	0.2																	●																				
			110304	0.4													●				●		●	●	●									●	●			●			●
			110308	0.8													●				●													●	●						●
	GU 5°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	TPMT 110304N-GU	0.4	●	●	●	●				●	●	●																				●							
			110308N-GU	0.8	●	●	●	●				●	●	●																				●							
	MU 0°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	TPMT 110304N-MU	0.4	●	●	●		●	●		●	●			●	●	●	●	▲	▲																			
			110308N-MU	0.8	●	●	●		●	●		●	●			●	●	●	●	▲	▲																			
	SF 0°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	TPMH 110304N-SF	0.4			●	●		●	●																												
			110308N-SF	0.8			●	●		●	●																												
For Aluminum	**AY** 15°	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) N	TPGT 110301R-AY	0.1																																			●
			110301L-AY	0.1																																			●
			110302R-AY	0.2																																			●
			110302L-AY	0.2																																			●
			110304R-AY	0.4																																			●
			110304L-AY	0.4																																			●

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TP Triangular type / 11° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✲ Interrupted Cutting 2nd Recommendation

TP■■1603●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

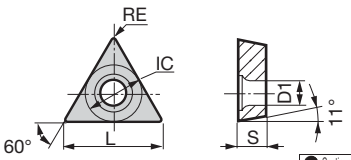
SUMIBORON (CBN) Inserts L96 SUMIDIA (PCD) Inserts M20
Applicable Boring Bars E42, E46

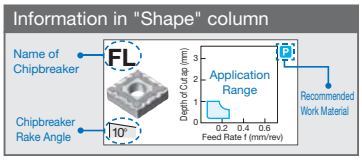
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB**		**TPMT 160304N-FB**	0.4																									●		●	●	▲	●	●								
			160308N-FB	0.8																									●		●	●	▲	●	●								
	FX		**TPGT 160304R-FX**	0.4																				●	●			●															
			160304L-FX	0.4																				●	●			●															
			160308R-FX	0.8																				●	●			●															
			160308L-FX	0.8																				●	●			●															
	FY		**TPGT 160302R-FY**	0.2																				●	●			●															
			160302L-FY	0.2																				●	●			●															
			TPGT 160304R-FY	0.4																				●	●			●															
			160304L-FY	0.4																				●	●			●															
			160308R-FY	0.8																				●	●			●															
			160308L-FY	0.8																				●	●			●															
Light Cutting	**LB**		**TPMT 160304N-LB**	0.4		●	●	●		●	●	●	●	●																	●	●	▲		●							
			160308N-LB	0.8		●	●	●		●	●	●	●	●																	●	●	▲		●							

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TP Triangular type 11° Pos. With Hole





● Continuous Cutting 1st Recommendation
○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation
◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation
✖ Interrupted Cutting 2nd Recommendation

TP■■1604●●

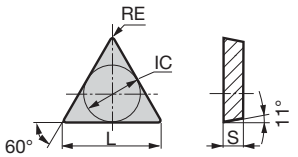
Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application

P	Steel	● ◔ ● ✖ ○ ◔ ✖ ○ ◔ ✖ ○ ◔

Triangular type Positive Inserts

TP Triangular type 11° Pos. Without Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TP■■0902●●

Dimensions (mm)	Cutting Edge Length L	9.6	Thickness S	2.38
	Inscribed Circle IC	5.56		

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L99 SUMIDIA (PCD) Inserts M21

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FK		TPMR 090204N-FK	0.4																															●								
Finishing to Light Cutting	W		TPGR 090202R-W	0.2																															●								
			090202L-W	0.2																															●								
			090204R-W	0.4																															●								
			090204L-W	0.4																															●	●							
			090208R-W	0.8																															●								
			090208L-W	0.8																															●								
Light Cutting			TPGN 090202	0.2																															●								
			090204	0.4																															●							●	
			090208	0.8																															●							●	

TP■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	3.18
	Inscribed Circle IC	6.35		

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

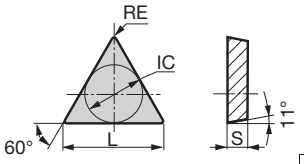
SUMIBORON (CBN) Inserts L99 on SUMIDIA (PCD) Inserts M21
Ceramic Inserts B128 Applicable Boring Bars E46

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FK		TPMR 110302N-FK	0.2																															●	●							
			110304N-FK	0.4																												●	●	▲	●	●							
			110308N-FK	0.8																												●			●	●							
Finishing to Light Cutting	W		TPGR 110302R-W	0.2																												●			●	●							
			110302L-W	0.2																												●			●	●							
			110304R-W	0.4																												●			●	●							
			110304L-W	0.4																												●			●	●	●						
			110308L-W	0.8																												●			●	●							
Light to Medium Cutting	SF		TPMR 110304N-SF	0.4			●	●		●	●																								●							
			110308N-SF	0.8			●	●		●	●																																
	UJ		TPMR 110304N-UJ	0.4			●	●		●	●																																
			110308N-UJ	0.8			●	●		●	●																																
Medium Cutting			TPMN 110304	0.4													●	●	●	▲	▲		●	●	●	●														●	●			
			110308	0.8													●	●	●	▲	▲		●	●	●	●														●	●			

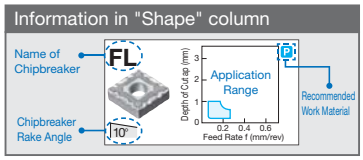
▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TP Triangular type 11° Pos. Without Hole



Information in "Shape" column



● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TP■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	3.18
	Inscribed Circle IC	6.35		

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L99 on | SUMIDIA (PCD) Inserts M21
Ceramic Inserts B128 | Applicable Boring Bars E46

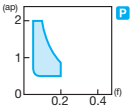
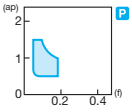
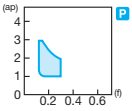
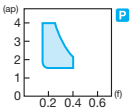
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			TPGN 110302	0.2																														●	●							●
			110304	0.4																				●	●	●								●	●				●			●
			110308	0.8																														●	●				●			●
			110312	1.2																														●	●							●

TP■■1603●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	3.18
	Inscribed Circle IC	9.525		

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

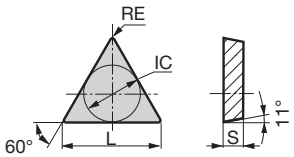
SUMIBORON (CBN) Inserts L101 | SUMIDIA (PCD) Inserts M20
Ceramic Inserts B128
Applicable External Holders C36, C37 | Applicable Boring Bars E46

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	CVD AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FK 0°		TPMR 160304N-FK	0.4																										●	●	▲	●	●							
			160308N-FK	0.8																										●	●	▲	●	●							
			160312N-FK	1.2																													●								
Finishing to Light Cutting	W 0°		TPGR 160302R-W	0.2																										●			●	●							
			160302L-W	0.2																										●			●	●							
			160304R-W	0.4																										●			●	●							
			160304L-W	0.4																										●			●	●	●						
			160308R-W	0.8																										●			●	●							
			160308L-W	0.8																										●			●	●							
Light to Medium Cutting	SF 0°		TPMR 160304N-SF	0.4			●	●		●	●																								●					
			160308N-SF	0.8			●	●		●	●																								●					
			160312N-SF	1.2			●			●																															
	UJ 0°		TPMR 160304N-UJ	0.4			●	●		●	●																													
			160308N-UJ	0.8			●	●		●	●																														
Medium Cutting			TPMN 160304	0.4												●	●	●	▲	▲		●	●	●	●								●			●	●	●			
			160308	0.8												●	●	●	▲	▲		●	●	●	●								●	●		●	●	●			
			160312	1.2												●	●	●	▲	▲																	●	●			
			TPGN 160302	0.2																														●	●				●		
			160304	0.4																				●	●	●								●	●			●	●		●
			160308	0.8																				●	●	●								●	●			●	●		●
			160312	1.2																																			●		
			160316	1.6																																					

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Triangular type Positive Inserts

TP Triangular type 11° Pos. Without Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

TP■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	4.76
	Inscribed Circle IC	9.525		

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

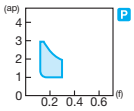
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Medium Cutting			**TPGN 160404**	0.4																																							
			160408	0.8																																			●				
			160412	1.2																																							
			160416	1.6																																							

TP■■2204●●

Dimensions (mm)	Cutting Edge Length L	22.0	Thickness S	4.76
	Inscribed Circle IC	12.7		

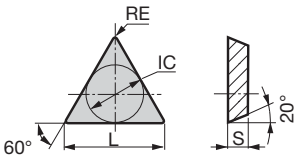
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

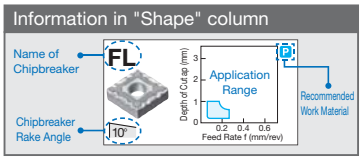
SUMIBORON (CBN) Inserts ☞ L102
Applicable External Holders ☞ C36, C37

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet (PVD) T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	**SF** 0°	 (ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**TPMR 220408N-SF**	0.8																																							
			220412N-SF	1.2																																							
Medium Cutting			**TPMN 220404**	0.4																																●							
			220408	0.8																			●	●	●	●									●	●	●	●	●				
			220412	1.2																			●	●	●	●											●	●	●				
			220416	1.6																																	●	●					
			TPGN 220404	0.4																																			●				
			220408	0.8																				●	●	●												●	●				
			220412	1.2																																								
			220416	1.6																																							

Triangular type Positive Inserts

TE Triangular type 20° Pos. Without Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

TE■■1102●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	2.38
	Inscribed Circle IC	6.35		

SUMIDIA (PCD) Inserts M22

	Shape	Application Range	Cat. No.	Corner Radius RE
Light Cutting			TEGN 110202	0.2
			110204	0.4
			110208	0.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Coated Carbide (CVD / PVD / CVD / PVD): AC8015P, AC8020P, AC8025P, AC8035P, AC810P, AC820P, AC830P, AC6020M, AC6030M, AC6040M, AC610M, AC630M, AC4010K, AC4015K, AC420K, AC405K, AC415K, AC503U, AC5005S, AC5015S, AC5025S, AC510U, AC520U, AC1030U, AC530U, ACZ150
Coated Cermet (PVD): T1500Z, T2500Z, T3000Z
Cermet: T1000A
Cemented Carbide: T1500A, ST10P, ST20E, A30, G10E, EH510, EH520, H1

TE■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.0	Thickness S	3.18
	Inscribed Circle IC	6.35		

SUMIDIA (PCD) Inserts M22

	Shape	Application Range	Cat. No.	Corner Radius RE
Light Cutting			TEGN 110302	0.2
			110304	0.4
			110308	0.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Coated Carbide (CVD / PVD / CVD / PVD): AC8015P, AC8020P, AC8025P, AC8035P, AC810P, AC820P, AC830P, AC6020M, AC6030M, AC6040M, AC610M, AC630M, AC4010K, AC4015K, AC420K, AC405K, AC415K, AC503U, AC5005S, AC5015S, AC5025S, AC510U, AC520U, AC1030U, AC530U, ACZ150
Coated Cermet (PVD): T1500Z, T2500Z, T3000Z
Cermet: T1000A
Cemented Carbide: T1500A, ST10P, ST20E, A30, G10E, EH510, EH520, H1

TE■■1603●●

Dimensions (mm)	Cutting Edge Length L	16.5	Thickness S	3.18
	Inscribed Circle IC	9.525		

SUMIDIA (PCD) Inserts M22

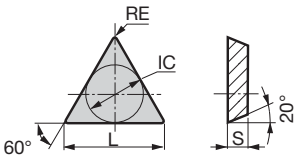
	Shape	Application Range	Cat. No.	Corner Radius RE
Light to Medium Cutting			TEGN 160302	0.2
			160304	0.4
			160308	0.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Coated Carbide (CVD / PVD / CVD / PVD): AC8015P, AC8020P, AC8025P, AC8035P, AC810P, AC820P, AC830P, AC6020M, AC6030M, AC6040M, AC610M, AC630M, AC4010K, AC4015K, AC420K, AC405K, AC415K, AC503U, AC5005S, AC5015S, AC5025S, AC510U, AC520U, AC1030U, AC530U, ACZ150
Coated Cermet (PVD): T1500Z, T2500Z, T3000Z
Cermet: T1000A
Cemented Carbide: T1500A, ST10P, ST20E, A30, G10E, EH510, EH520, H1

Triangular type Positive Inserts

TE Triangular type 20° Pos. Without Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

TE■■2204●●

Dimensions (mm)	Cutting Edge Length L	22.0	Thickness S	4.76
	Inscribed Circle IC	12.7		

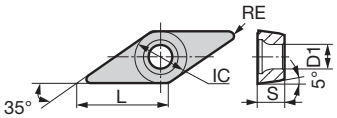
SUMIDIA (PCD) Inserts ☞ M22

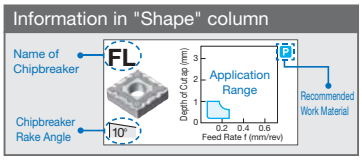
Recommended Application

		Coated Carbide																						Coated Cermet			Cermet	Cemented Carbide								
		CVD								PVD	CVD					PVD								PVD												
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC5003U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light to Medium Cutting	▽		**TEGN 220404**	0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	●
			220408	0.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
			220412	1.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

35° Diamond type Positive Inserts

VB 35° Diamond type 5° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

VB■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.1	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞L106, L107

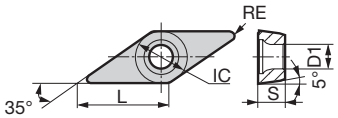
Applicable Boring Bars ☞E50, E52, E53, E55, E56, E58, E59

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	CVD: AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB**		**VBMT 110302N-FB**	0.2																									●		●	●	▲	●	●							
	20°		**110304N-FB**	0.4																									●		●	●	▲	●	●							
			110308N-FB	0.8																									●		●	●	▲	●	●							
	LU		**VBMT 110302N-LU**	0.2																									●		●	●		●	●							
	15°		**110304N-LU**	0.4	●	●	●		●	●				●		●													●		●	●	▲	●	●							
			110308N-LU	0.8	●	●	●						●	●		●													●													
	FX		**VBGT 110301R-FX**	0.1																				●	●			●	●	●			●		●	●						
	15°		**110301L-FX**	0.1																				●	●			●	●	●			●		●	●						
			110302R-FX	0.2																				●	●			●	●	●			●		●	●						
			110302L-FX	0.2																				●	●			●	●	●			●		●	●						
			110304R-FX	0.4																				●	●			●	●	●			●		●	●						
			110304L-FX	0.4																				●	●			●	●	●			●		●	●						
	FYS		**VBGT 1103003R-FYS**	0.03																				●	●			●													
	15°		**1103003L-FYS**	0.03																				●	●			●													
			110301R-FYS	0.1																				●	●			●													
			110301L-FYS	0.1																				●	●			●													
			110302R-FYS	0.2																				●	●			●													
			110302L-FYS	0.2																				●	●			●													
			110304R-FYS	0.4																				●	●			●													
			110304L-FYS	0.4																				●	●			●													
			110308R-FYS	0.8																				●	●			●													
			110308L-FYS	0.8																				●	●			●													
	FYS		**VBET 1103003R-FYS**	0.03																								●													
	15°		**1103003L-FYS**	0.03																								●													
			110301R-FYS	0.1																								●													
			110301L-FYS	0.1																								●													
			110302R-FYS	0.2																								●													
			110302L-FYS	0.2																								●													
			110304R-FYS	0.4																								●													
			110304L-FYS	0.4																								●													
			110308R-FYS	0.8																								●													
			110308L-FYS	0.8																								●													
	FY		**VBGT 110301R-FY**	0.1																				●	●			●	●	●			●		●	●						
	15°		**110301L-FY**	0.1																				●	●			●	●	●			●		●	●						
			110302R-FY	0.2																				●	●			●	●	●			●		●	●						
			110302L-FY	0.2																				●	●			●	●	●			●		●	●						
			110304R-FY	0.4																				●	●			●	●	●						●						
			110304L-FY	0.4																				●	●			●	●	●						●						

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

35° Diamond type Positive Inserts

VB 35° Diamond type / 5° Pos. / With Hole



Grade Selection Guide ☞ A2
Chipbreaker Selection ☞ B4 on
Insert Grade Selection Guide by Work Material ☞ A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

VB■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.1	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞ L106, L107
Applicable Boring Bars ☞ E50, E52, E53, E55, E56, E58, E59

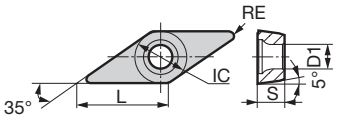
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	**LB**	(ap) 2 1 0 0.2 0.4 (f) P	**VBMT 110302N-LB**	0.2	●	●	●		●	●	●	●	●																	●	●	▲		●							
	15°		**110304N-LB**	0.4	●	●	●		●	●	●	●	●																	●	●	▲		●							
			110308N-LB	0.8	●	●	●		●	●	●	●	●																	●	●	▲		●							
	SU	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**VBMT 110302N-SU**	0.2																	●	●	●				●														
	8°		**110304N-SU**	0.4		●	●							●	▲	●						●	●	●				●			●	▲									
			110308N-SU	0.8		●	●					●	●	●	▲	●						●	●	●				●													
	SI	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**VBGT 110301MN-SI**	< 0.1																			●	●	●	●	●	●													
	15°		**110302MN-SI**	< 0.2																			●	●	●	●	●	●													
			110304MN-SI	< 0.4																			●	●	●	●	●	●													
			110308MN-SI	< 0.8																			●	●	●	●	●	●													
Light to Medium Cutting	**GU**	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**VBMT 110304N-GU**	0.4	●	●	●	●				●	●	●																	●	●			●							
	5°		**110308N-GU**	0.8	●	●	●	●				●	●	●																	●	●			●							
For Aluminum	**AY**	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) N	**VBGT 110301R-AY**	0.1																																					●
	15°		**110301L-AY**	0.1																																					●
			110302R-AY	0.2																																					●
			110302L-AY	0.2																																					●
			110304R-AY	0.4																																					●
			110304L-AY	0.4																																					●

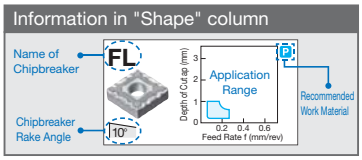
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

35° Diamond type Positive Inserts

VB 35° Diamond type 5° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

VB■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.6	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts ☞L108, L109

Applicable Boring Bars ☞E14, E50, E52, E55, E58

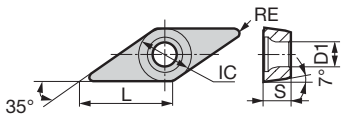
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	CVD: AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	FB		VBMT 160404N-FB	0.4																									●		●	●	▲	●	●							
			160408N-FB	0.8																									●		●	●	▲	●	●							
	LU		VBMT 160404N-LU	0.4	●	●	●		●	●			●	●		●													●		●	●	▲	●	●							
			160408N-LU	0.8	●	●	●		●	●			●	●		●													●		●	●	▲	●	●							
	FX		VBGT 160402R-FX	0.2																														●	●							
			160402L-FX	0.2																														●	●							
			160404R-FX	0.4																														●	●							
			160404L-FX	0.4																														●	●							
Light Cutting	LB		VBMT 160404N-LB	0.4		●	●	●		●	●	●	●	●																	●	●	▲		●						
			160408N-LB	0.8		●	●	●		●	●	●	●	●																	●	●	▲		●						
			160412N-LB	1.2		●	●	●		●	●	●	●	●																	●	●	▲		●						
	SU		VBMT 160404N-SU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●							●	●	●							●	●	▲	●	●						
			160408N-SU	0.8	●	●	●	●	●	●	●	●	●	●	▲	●							●	●	●							●	●	▲	●	●						
			160412N-SU	1.2	●	●	●			●																																
	SI		VBGT 160401MN-SI	< 0.1																				●	●	●	●	●	●													
			160402MN-SI	< 0.2																				●	●	●	●	●	●													
			160404MN-SI	< 0.4																				●	●	●	●	●	●													
			160408MN-SI	< 0.8																				●	●	●	●	●	●													
Light to Medium Cutting			VBMW 160404	0.4												●	●	●	▲	▲																					
			160408	0.8												●	●	●	▲	▲																					
	GU		VBMT 160404N-GU	0.4	●	●	●	●				●	●	●																	●	●			●						
			160408N-GU	0.8	●	●	●	●				●	●	●																	●	●			●						
For Aluminum	AY		VBGT 160402R-AY	0.2																																					●
			160402L-AY	0.2																																					●
			160404R-AY	0.4																																					●
			160404L-AY	0.4																																					●

A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

35° Diamond type Positive Inserts

VC 35° Diamond type 7° Pos. With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ◔ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

VC■■0802●●

Dimensions (mm)	Cutting Edge Length L	8.3	Thickness S	2.38
	Inscribed Circle IC	4.76	Hole Dia. D1	2.3

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L110 SUMIDIA BINDERLESS Inserts M28
Applicable Boring Bars E51, E54, E57, E60

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FB**	(ap) 2 1 0 0.2 0.4 (f) P	**VCMT 080202N-FB**	0.2																									●	●	●	▲	●	●								
	20°		**080204N-FB**	0.4																									●	●	●	▲	●	●								
	FC	(ap) 2 1 0 0.2 0.4 (f) P	**VCGT 080204MN-FC**	< 0.4																			●	●		●	●	●	●														
	15°																																										
Light Cutting	**LB**	(ap) 2 1 0 0.2 0.4 (f) P	**VCMT 080202N-LB**	0.2	●	●	●		●	●	●	●	●																	●	●	▲		●							
	15°		**080204N-LB**	0.4	●	●	●		●	●	●	●	●																	●	●	▲		●							
	SU	(ap) 4 3 2 1 0 0.2 0.4 0.6 (f) P	**VCMT 080204N-SU**	0.4							●	●	●		●								●	●	●				●													
	8°																																										

A "<" next to the corner radius RE indicates a negative tolerance.

VC■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.1	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L111 SUMIDIA (PCD) Inserts M23 SUMIDIA BINDERLESS Inserts M28
Applicable External Holders C40, C41, D15, D28 Applicable Boring Bars E54, E57, E60

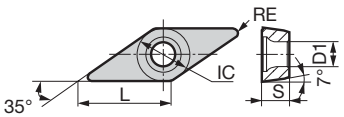
	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide (CVD) AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	(PVD) AC6040M	AC610M	AC630M	(CVD) AC4010K	AC4015K	AC420K	AC405K	AC415K	(PVD) AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC Z150	Coated Cermet T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	**FF**	(ap) 2 1 0 0.2 0.4 (f) P	**VCGT 110301MN-FF** New	< 0.1																			●	●			●														
	15°		**110302MN-FF** New	< 0.2																			●	●			●														
			110304MN-FF New	< 0.4																			●	●			●														
Finishing	**FC**	(ap) 2 1 0 0.2 0.4 (f) P	**VCGT 110301MN-FC**	< 0.1																			●	●		●	●	●	●					●	●						
	15°		**110302MN-FC**	< 0.2																			●	●		●	●	●	●					●	●						
			110304MN-FC	< 0.4																			●	●		●	●	●	●					●	●						
	FX	(ap) 2 1 0 0.2 0.4 (f) P	**VCGT 110301R-FX**	0.1																			●	●		●	●	●	●					●	●						
	15°		**110301L-FX**	0.1																			●	●		●	●	●	●					●	●						
			110302R-FX	0.2																			●	●		●	●	●	●					●	●						
			110302L-FX	0.2																			●	●		●	●	●	●					●	●						
			110304R-FX	0.4																			●	●		●		●	●					●	●						
			110304L-FX	0.4																			●	●		●		●	●					●	●						
	FX	(ap) 2 1 0 0.2 0.4 (f) P	**VCET 1103008R-FX**	0.08																								●	●												
	15°		**1103008L-FX**	0.08																								●	●												
			110301R-FX	0.1																								●	●												
			110301L-FX	0.1																								●	●												
			1103018R-FX	0.18																								●	●												
			1103018L-FX	0.18																								●	●												

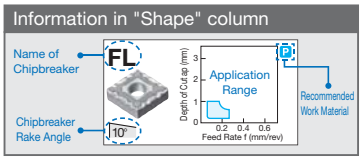
A "<" next to the corner radius RE indicates a negative tolerance.

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

35° Diamond type Positive Inserts

VC 35° Diamond type 7° Pos. With Hole





● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
● Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

VC■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.1	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

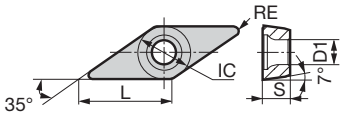
SUMIBORON (CBN) Inserts L111 | SUMIDIA (PCD) Inserts M23 | SUMIDIA BINDERLESS Inserts M28

Applicable External Holders C40, C41, D15, D28 | Applicable Boring Bars E54, E57, E60

| | Shape | Application Range | Cat. No. | Corner Radius RE | Coated Carbide: CVD AC8015P | AC8020P | AC8025P | AC8035P | AC810P | AC820P | AC830P | AC6020M | AC6030M | PVD AC6040M | CVD AC610M | AC630M | AC4010K | AC4015K | AC420K | AC405K | AC415K | PVD AC503U | AC5005S | AC5015S | AC5025S | AC510U | AC520U | AC1030U | AC530U | Coated Cermet PVD AC6040M | AC610M | AC630M | AC4010K | AC4015K | AC420K | AC405K | AC415K | AC503U | AC5005S | AC5015S | AC5025S | AC510U | AC520U | AC1030U | AC530U | AC6040M | AC610M | AC630M | AC4010K | AC4015K | AC420K | AC405K | AC415K | AC503U | AC5005S | AC5015S | AC5025S | AC510U | AC520U | AC1030U | AC530U | Cermet T1500Z | T2500Z | T3000Z | T1000A | T1500A | ST10P | Cemented Carbide ST20E | A30 | G10E | EH510 | EH520 | H1 |
|---|---|---|---|---

35° Diamond type Positive Inserts

VC 35° Diamond type 7° Pos. With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✱ Interrupted Cutting 1st Recommendation ✱ Interrupted Cutting 2nd Recommendation

VC■■1604●●

Dimensions (mm)	Cutting Edge Length L	16.6	Thickness S	4.76
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

SUMIBORON (CBN) Inserts L112
SUMIDIA (PCD) Inserts M23, M24
SUMIDIA BINDERLESS Inserts M28
Applicable External Holders C40, C41
Applicable Boring Bars E54, E57

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	SU	P	VCMT 160404N-SU	0.4	●	●	●	●	●	●	●	●	●	●	▲	●						●	●	●		●		●						●	●							
			160408N-SU	0.8	●	●	●	●	●	●	●	●	●	▲	●							●	●	●		●		●						●	●							
	SI	P	VCGT 160401MN-SI	< 0.1										▲	●								●	●	●	●	●	●	●		●	●		●	●							
			160402MN-SI	< 0.2										▲	●								●	●	●	●	●	●	●		●	●		●	●							
			160404MN-SI	< 0.4										▲	●								●	●	●	●	●	●	●		●	●		●	●							
			160408MN-SI	< 0.8																			●	●	●	●	●	●	●													
Light to Medium Cutting	GU	P	VCMT 160404N-GU	0.4	●	●	●	●				●	●	●											●																	
			160408N-GU	0.8	●	●	●	●				●	●	●											●																	
For Aluminum	AW		VCGT 160408N-AW	0.8																																					
			160412N-AW	1.2																																					
	AG	N	VCGT 160408N-AG	0.8																																					
			160412N-AG	1.2																																					

A "<" next to the corner radius RE indicates a negative tolerance.

VC■■2205●●

Dimensions (mm)	Cutting Edge Length L	20.2	Thickness S	5.56
	Inscribed Circle IC	12.7	Hole Dia. D1	5.5

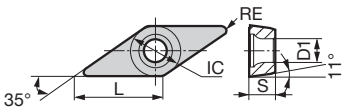
Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

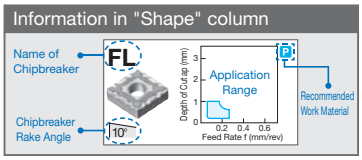
SUMIDIA (PCD) Inserts M24
Applicable External Holders C45

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD AC6040M	AC610M	AC630M	CVD AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	ACZ150	Coated Cermet PVD T1500Z	T2500Z	T3000Z	Cermet T1000A	T1500A	Cemented Carbide ST10P	ST20E	A30	G10E	EH510	EH520	H1
For Aluminum	AW		VCGT 220510N-AW	1.0																																					
			220516N-AW	1.6																																					
			220520N-AW	2.0																																					
			220530N-AW	3.0																																					
	AG	N	VCGT 220530N-AG	3.0																																					

35° Diamond type Positive Inserts

VP 35° Diamond type / 11° Pos. / With Hole





VP■■0802●●

Dimensions (mm)	Cutting Edge Length L	8.3	Thickness S	2.38
	Inscribed Circle IC	4.76	Hole Dia. D1	2.4

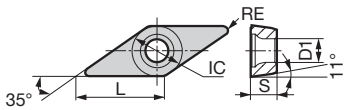
● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

Recommended Application

		Coated Carbide																						Coated Cermet			Cermet	Cemented Carbide								
		CVD								PVD	CVD					PVD								PVD												
	Shape	Application Range	Cat. No.	Corner Radius RE	AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	AC6040M	AC610M	AC630M	AC4010K	AC4015K	AC420K	AC405K	AC415K	AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	T1500Z	T2500Z	T3000Z	T1000A	T1500A	ST10P	ST20E	A30	G10E	EH510	EH520	H1
Finishing	**FX**		VPET 0802008R-FX	0.08																																			
			0802008L-FX	0.08																																			
			0802015R-FX	0.15																																			
			0802015L-FX	0.15																																			
			0802018R-FX	0.18																																			
			0802018L-FX	0.18																																			
	FY		VPET 0802008R-FY	0.08																																			
			0802008L-FY	0.08																																			
			0802015R-FY	0.15																																			
			0802015L-FY	0.15																																			
			0802018R-FY	0.18																																			
			0802018L-FY	0.18																																			

35° Diamond type Positive Inserts

VP 35° Diamond type / 11° Pos. / With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

VP■■1103●●

Dimensions (mm)	Cutting Edge Length L	11.1	Thickness S	3.18
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy, H Hardened Steel

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
Interrupted Cutting 1st Recommendation / Interrupted Cutting 2nd Recommendation

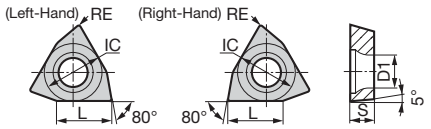
Applicable External Holders D15, D29

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC5003U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet: PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Fine Cutting	FF		VPGT 110301MN-FF New	< 0.1																				●	●				●														
			110302MN-FF New	< 0.2																				●	●				●														
Finishing	FX		VPGT 110301R-FX	0.1																																						
			110301L-FX	0.1																																						
			110302R-FX	0.2																																						
			110302L-FX	0.2																																						
	FX		VPET 1103003R-FX	0.03																								●		●													
			1103003L-FX	0.03																								●		●													
			110301R-FX	0.1																								●		●													
			110301L-FX	0.1																								●		●													
			110302R-FX	0.2																								●		●													
			110302L-FX	0.2																								●		●													
	FY		VPGT 110301R-FY	0.1																																						
			110301L-FY	0.1																																						
			110302R-FY	0.2																																						
			110302L-FY	0.2																																						
	FY		VPET 1103003R-FY	0.03																								●		●													
			1103003L-FY	0.03																								●		●													
			110301R-FY	0.1																								●		●													
			110301L-FY	0.1																								●		●													
			110302R-FY	0.2																								●		●													
			110302L-FY	0.2																								●		●													
Light Cutting	SI		VPGT 110301MN-SI New	< 0.1																				●	●				●													
			110302MN-SI New	< 0.2																				●	●				●													

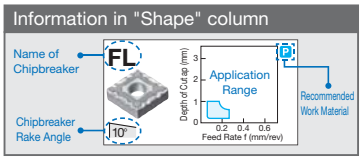
A "<" next to the corner radius RE indicates a negative tolerance.

Trigon type Positive Inserts

WB Trigon type 5° Pos. With Hole



*Uneven Trigon type



● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ○ Interrupted Cutting 2nd Recommendation

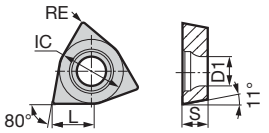
WB■■0601●●

Dimensions (mm)	Cutting Edge Length L	3.2	Thickness S	1.59
	Inscribed Circle IC	3.97	Hole Dia. D1	2.2

Recommended Application: P Steel ● ○ ● ✖ ○ ○ ✖ ○ ○ ● ✖ ○ ○ ● ● ✖ ○ ○ ✖ ✖ ✖ ● ● ✖ ✖ ✖ ● ● ●

Trigon type Positive Inserts

WP Trigon type 11° Pos. With Hole



Grade Selection Guide A2
Chipbreaker Selection B4 on
Insert Grade Selection Guide by Work Material A8 on

● Continuous Cutting 1st Recommendation ○ Continuous Cutting 2nd Recommendation
● General Machining 1st Recommendation ○ General Machining 2nd Recommendation
✖ Interrupted Cutting 1st Recommendation ✖ Interrupted Cutting 2nd Recommendation

WP■■1102●●

Dimensions (mm)	Cutting Edge Length L	4.3	Thickness S	2.38
	Inscribed Circle IC	6.35	Hole Dia. D1	2.8

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Applicable Boring Bars E63

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	LB		WPMT 110204N-LB	0.4	●	●	●	●		●	●	●	●	●								—								—	●	●	▲		●								

WP■■1603●●

Dimensions (mm)	Cutting Edge Length L	6.5	Thickness S	3.18
	Inscribed Circle IC	9.525	Hole Dia. D1	4.4

Recommended Application: P Steel; M Stainless Steel; K Cast Iron; N Non-Ferrous Metal; S Exotic Alloy; H Hardened Steel

Applicable Boring Bars E63

	Shape	Application Range	Cat. No.	Corner Radius RE	Coated Carbide: CVD: AC8015P	AC8020P	AC8025P	AC8035P	AC810P	AC820P	AC830P	AC6020M	AC6030M	PVD: AC6040M	AC610M	AC630M	CVD: AC4010K	AC4015K	AC420K	AC405K	AC415K	PVD: AC503U	AC5005S	AC5015S	AC5025S	AC510U	AC520U	AC1030U	AC530U	AC2150	Coated Cermet PVD: T1500Z	T2500Z	T3000Z	Cermet: T1000A	T1500A	Cemented Carbide: ST10P	ST20E	A30	G10E	EH510	EH520	H1
Light Cutting	LB		WPMT 160308N-LB	0.8	●	●	●	●		●	●	●	●	●								—								—	●	●	▲		●								

▲ mark: To be replaced by a new product, made to order or discontinued (please confirm stock availability)

Ceramic Inserts

Negative With Hole

(Legend) Continuous Cutting: ●: 1st Recommended, ○: 2nd Recommended; General Machining: ●: 1st Recommended, ○: 2nd Recommended; Interrupted Cutting: ✖: 1st Recommended, ✲: 2nd Recommended

Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy (○), H Hardened Steel (○)

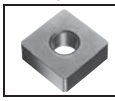
◇ 80° Diamond type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	CNGA 120404	—	●	●	12.70	4.76	0.4	5.16
	CNGA 120408	—	●	●	12.70	4.76	0.8	5.16
	CNGA 120412	—	●	●	12.70	4.76	1.2	5.16

◇ 55° Diamond type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	DNGA 150404	—		●	12.70	4.76	0.4	5.16
	DNGA 150408	—		●	12.70	4.76	0.8	5.16
	DNGA 150412	—		●	12.70	4.76	1.2	5.16

□ Square type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	SNGA 120404	—		●	12.70	4.76	0.4	5.16
	SNGA 120408	—		●	12.70	4.76	0.8	5.16
	SNGA 120412	—		●	12.70	4.76	1.2	5.16

△ Triangular type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	TNGA 160404	—		●	9.525	4.76	0.4	3.81
	TNGA 160408	—	●	●	9.525	4.76	0.8	3.81
	TNGA 160412	—			9.525	4.76	1.2	3.81
	TNGA 160416	—		—	9.525	4.76	1.6	3.81

◇ 35° Diamond type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	VNGA 160404	—		●	9.525	4.76	0.4	3.81
	VNGA 160408	—		●	9.525	4.76	0.8	3.81

Negative Without Hole

(Legend) Continuous Cutting: ●: 1st Recommended, ○: 2nd Recommended; General Machining: ●: 1st Recommended, ○: 2nd Recommended; Interrupted Cutting: ✖: 1st Recommended, ✲: 2nd Recommended

Recommended Application: P Steel, M Stainless Steel, K Cast Iron, N Non-Ferrous Metal, S Exotic Alloy (○), H Hardened Steel (○)

◇ 80° Diamond type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	CNGN 120408	●	●	—	12.70	4.76	0.8	—
	CNGN 120412		●	—	12.70	4.76	1.2	—
	CNGN 120416	●		—	12.70	4.76	1.6	—
	CNGN 120712			—	12.70	7.94	1.2	—

◇ 55° Diamond type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	DNGN 150408		●	—	12.70	4.76	0.8	—
	DNGN 150412			—	12.70	4.76	1.2	—
	DNGN 150416			—	12.70	4.76	0.8	—
	DNGN 150712		●	—	12.70	7.94	1.2	—

◇ 75° Diamond type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	ENGN 130408			—	12.70	4.76	0.8	—
	ENGN 130412			—	12.70	4.76	1.2	—
	ENGN 130708		●	—	12.70	7.94	0.8	—
	ENGN 130712		●	—	12.70	7.94	1.2	—

○ Round type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	RNGN 120400	●		—	12.70	4.76	—	—
	RNGN 120700	●	●	—	12.70	7.94	—	—
	RNGN 150700			—	15.875	7.94	—	—

□ Square type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	SNGN 120408	●	●	—	12.70	4.76	0.8	—
	SNGN 120412	●	●	—	12.70	4.76	1.2	—
	SNGN 120416	●	●	—	12.70	4.76	1.6	—
	SNGN 120420			—	12.70	4.76	2.0	—
	SNGN 120708			—	12.70	7.94	0.8	—
	SNGN 120712		●	—	12.70	7.94	1.2	—
	SNGN 120716			—	12.70	7.94	1.6	—
	SNGN 120720		●	—	12.70	7.94	2.0	—

△ Triangular type

Shape	Cat. No.	Ceramics WX120	Ceramics NB90S	Ceramics NB100C	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	TNGN 160404		●	—	9.525	4.76	0.4	—
	TNGN 160408	●	●	—	9.525	4.76	0.8	—
	TNGN 160412	●	●	—	9.525	4.76	1.2	—
	TNGN 160712	—		—	9.525	7.94	1.2	—

WX120 is only sold in Japan.

Ceramic Inserts

Positive | Without Hole

(Legend)
- Continuous Cutting: ●: 1st Recommended, ○: 2nd Recommended
- General Machining: ◕: 1st Recommended, ◔: 2nd Recommended
- Interrupted Cutting: ✖: 1st Recommended, ✳: 2nd Recommended

Recommended Application

		WX120	NB90S	NB100C
P	Steel			
M	Stainless Steel			
K	Cast Iron			
N	Non-Ferrous Metal			
S	Exotic Alloy	◔		
H	Hardened Steel			○

◯ Round type

Shape	Cat. No.	WX120	NB90S	NB100C	Ceramics	Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	RBGN 120700			—		12.70	7.94	—	—
	RBGN 150700			—		15.875	7.94	—	—
	RBGN 250900			—		25.40	9.52	—	—
	RBG 12S			—		12.00	11.0	—	—
	RBG 16S		●	—		16.00	13.0	—	—
	RBG 20S		●	—		20.00	15.0	—	—
	RBG 26S			—		26.00	16.0	—	—
	RBG 32S			—		32.00	21.0	—	—
	RCGX 090700	●		—		9.525	7.94	—	—
	RCGX 120700			—		12.70	7.94	—	—

□ Square type

Shape	Cat. No.	WX120	NB90S	NB100C	Ceramics	Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	SPGN 090308			—		9.525	3.18	0.8	—
	SPGN 120308		●	—		12.70	3.18	0.8	—

△ Triangular type

Shape	Cat. No.	WX120	NB90S	NB100C	Ceramics	Inscribed Circle	Thickness	Corner Radius	Hole Dia.
	TPGN 110304		●	●		6.35	3.18	0.4	—
	TPGN 110308		●			6.35	3.18	0.8	—
	TPGN 160304		●	●		9.525	3.18	0.4	—
	TPGN 160308		●	●		9.525	3.18	0.8	—

WX120 is only sold in Japan.

Solid SUMIBORON

Indexable Inserts (Solid CBN type)

Refer to pages L122 to L125 for solid SUMIBORON dedicated holders.

Applications K Cast Iron H Hardened Steel

Shape	Cat. No.	BNC8115	BNS8125	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole	Applicable Holder
	CNGN 090308	●	●	9.525	3.18	0.8	No	External Dia. L123
	CNGN 090308LF			9.525	3.18	0.8	No	
	CNGN 090312	●	●	9.525	3.18	1.2	No	
	CNGN 090312LF			9.525	3.18	1.2	No	
	CNGN 120408	●	●	12.70	4.76	0.8	No	External Dia. L123
	CNGN 120412	●	●	12.70	4.76	1.2	No	
	CNGN 120416	●	●	12.70	4.76	1.6	No	
	CNGA 120408	●	●	12.70	4.76	0.8	Yes	External Dia. C10 ~ C12
	CNGA 120412	●	●	12.70	4.76	1.2	Yes	Internal Dia. E15, E23 ~ E25
	CNGX 120408			12.70	4.76	0.8	Dimple	External Dia. L125
	CNGX 120412	●	●	12.70	4.76	1.2	Dimple	
	CNGX 120416	●	●	12.70	4.76	1.6	Dimple	
	DNGN 110308	●	●	9.525	3.18	0.8	No	External Dia. L123
	DNGN 110308LF			9.525	3.18	0.8	No	
	DNGN 110312	●	●	9.525	3.18	1.2	No	
	DNGN 110312LF			9.525	3.18	1.2	No	
	RNGN 090300	●	●	9.525	3.18	-	No	External Dia. L124
	RNGN 090300LF			9.525	3.18	-	No	
	RNGN 120300	●	●	12.70	3.18	-	No	External Dia. L124
	RNGN 120300LF			12.70	3.18	-	No	
	RNGN 120400	●	●	12.70	4.76	-	No	
	SNGN 090308	●	●	9.525	3.18	0.8	No	External Dia. L122
	SNGN 090308LF			9.525	3.18	0.8	No	Milling Cutters H251 L145
	SNEN 090308W	●	●	9.525	3.18	0.8	No	
	SNEN 090308LFW			9.525	3.18	0.8	No	
	SNGN 090312	●	●	9.525	3.18	1.2	No	
	SNGN 090312LF			9.525	3.18	1.2	No	
	SNGN 120308	●	●	12.70	3.18	0.8	No	External Dia. L122
	SNGN 120308LF			12.70	3.18	0.8	No	
	SNGN 120312	●	●	12.70	3.18	1.2	No	
	SNGN 120312LF			12.70	3.18	1.2	No	
	SNGN 120408	●	●	12.70	4.76	0.8	No	External Dia. L122
	SNGN 120412	●	●	12.70	4.76	1.2	No	
	SNGN 120416	●	●	12.70	4.76	1.6	No	
	SNGN 120420	●	●	12.70	4.76	2.0	No	
	SNGA 120408	●	●	12.70	4.76	0.8	Yes	External Dia. C21 ~ C26
	SNGA 120412	●	●	12.70	4.76	1.2	Yes	Internal Dia. E39 ~ E41
	SNGX 120408			12.70	4.76	0.8	Dimple	External Dia. L125
	SNGX 120412	●	●	12.70	4.76	1.2	Dimple	
	SNGX 120416	●	●	12.70	4.76	1.6	Dimple	
	TNGN 110308	●	●	6.35	3.18	0.8	No	External Dia. L122
	TNGN 110308LF			6.35	3.18	0.8	No	
	TNGN 110312	●	●	6.35	3.18	1.2	No	
	TNGN 110312LF			6.35	3.18	1.2	No	
	TNGN 160408	●	●	9.525	4.76	0.8	No	External Dia. L122
	TNGN 160412	●	●	9.525	4.76	1.2	No	
	TNGN 160416	●	●	9.525	4.76	1.6	No	
	TNGN 160420	●	●	9.525	4.76	2.0	No	
	TNGA 160408	●	●	9.525	4.76	0.8	Yes	External Dia. C29 ~ C35
	TNGA 160412	●	●	9.525	4.76	1.2	Yes	External Dia. D16 D20
								Internal Dia. E15, E47 ~ E49

*Part number suffix: LF: Sharp edged W: Wiper type LFW: Wiper sharp edged

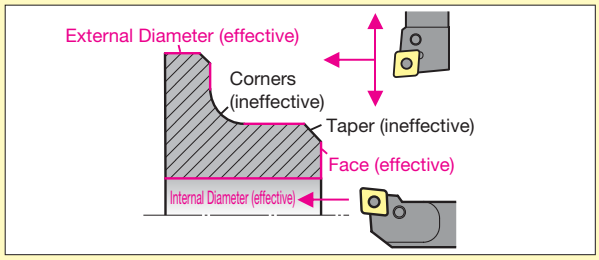
● mark: Standard stocked item (new product/expanded item)

Precautions when Using Wiper Inserts

Effectiveness of Wiper Inserts

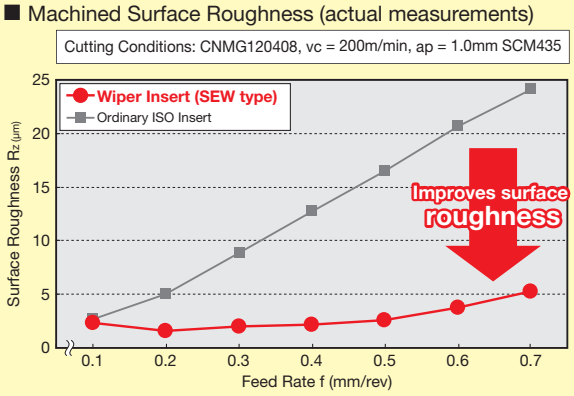
Wiper inserts are effective for external/internal diameter machining and for facing as shown in the figure below, and surface roughness of the machined surface can be maintained even in high-feed turning.

■ Effective Range of Wiper Inserts



* Note that wiper inserts leave the same machined surface roughness as normal inserts at tapers and corners.
* The cutting edge position may need to be offset depending on the insert shape. See the offset table below.

■ Machined Surface Roughness (actual measurements)

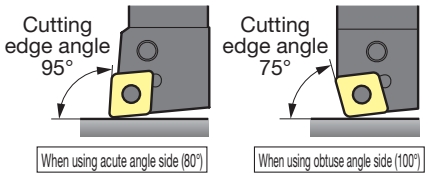


Coated Carbide / Coated Cermet / Cermet

CNMG/WNMG/CCMT/CPMT type

LUW/GUW/SEW type Chipbreaker (LUW type chipbreaker only for CCMT/CPMT type)

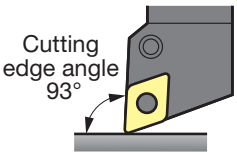
- Use a holder with a cutting edge angle of 95°.
- Machining program modification not required.
  CNMG type / WNMG type / CCMT type / CPMT type wiper inserts follow the ISO standard, allowing use without correcting the machining program.
- The obtuse (100°) corner on the CNMG type can also provide a wiper effect.



DNMX type

SEW type chipbreaker

- Use a holder with a cutting edge angle of 93°.
- Machining program modification required.
  DNMX type wiper inserts do not comply with the ISO standard. Correct the machining program as explained on the following page (B132).

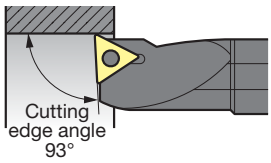


DNMX type Machining Program Modification Guide (→ B132)

TPGX type

SDW type chipbreaker

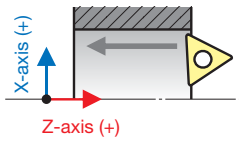
- Use a boring bar with a 93° cutting edge angle.
- Machining program modification required.
  TPGX type wiper inserts do not comply with the ISO standard. Correct the cutting edge position (tool offset) as explained on the right.



Note: Unlike the other profiles, the TPGX type is only effective for boring.

Cutting Edge Position Correction for TPGX type chipbreaker (SDW)

Internal boring



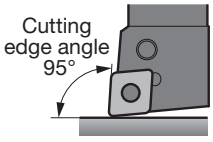
Corner Radius	X-axis Direction	Z-axis Direction
R0.4	0.12	-0.02
R0.8	0.12	-0.02

CBN (SUMIBORON / Coated SUMIBORON)

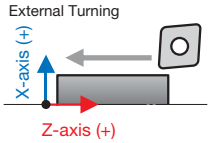
CNGA type/CCGW type/WNGA type

WG type / WH type Wiper Insert

- Use a holder with a cutting edge angle of 95°.
- Machining program modification required as CNGA type / CCGW type / WNGA type wiper inserts do not comply with the ISO standard profiles. Correct the cutting edge position (tool offset) as explained on the right.



CNGA type / CCGW type / WNGA type Wiper Insert Cutting Edge Position Offset (WG type / WH type)

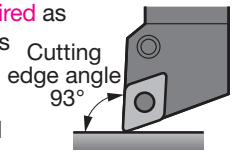


Corner Radius	Type	X-axis direction	Z-axis direction
R0.4	WG type	-0.02	-0.02
	WH type	-0.06	-0.06
R0.8/R1.2	WG type	-0.01	-0.01
	WH type	-0.06	-0.06

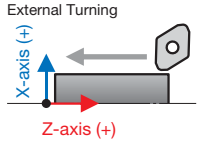
DNGA type / DCGW type

WG type / WH type Wiper Insert

- Use a holder with a cutting edge angle of 93°.
- Machining program modification required as DNGA type / DCGW type wiper inserts do not comply with the ISO standard profiles. Correct the cutting edge position (tool offset) as explained on the right.



DNGA type / DCGW type Wiper Insert Cutting Edge Position Offset (WG type / WH type)



Corner Radius	Type	X-axis direction	Z-axis direction
R0.4	WG type	-0.17	-0.01
	WH type	-0.70	-0.06
R0.8	WG type	-0.05	0
	WH type	-0.58	-0.05

Note: Unlike other contour shapes, the DNGA/DCGW types can only exhibit wiper effect for external and internal diameter machining, and cannot be used for facing.

Precautions when Using Wiper Inserts

Tool Program Correction Guide for DNMX type Wiper Inserts (Compensation: mm)

(1) Cutting edge position compensation (tool offset) in X and Z axes

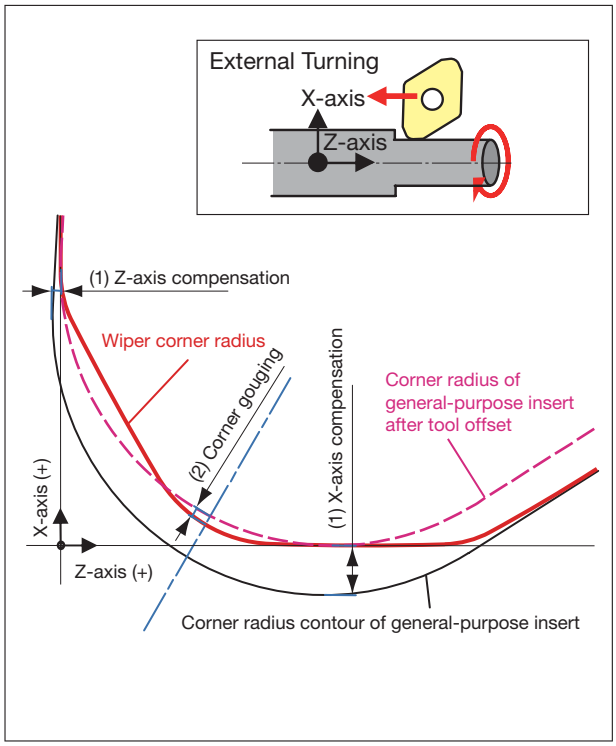
The cutting edge position for this insert differs from standard ISO inserts and therefore requires dimensional correction in the X and Z axes as shown in the table on the right.

*** The X-axis compensation is positive for internal boring.**

External Turning

Corner Radius	X-axis Direction	Z-axis Direction
R0.4	-0.14	-0.02
R0.8	-0.14	-0.02
R1.2	-0.1	-0.03

● Insert Corner Radius Diagram

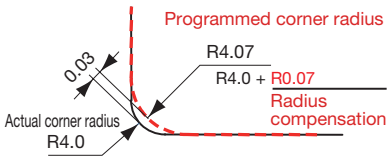


(2) Tool compensation for corners (based on compensation in step (1))

The programmed tool path must be corrected to prevent the insert from gouging into the workpiece's corner radius.

Programmed corner radius = actual corner radius + radius compensation

Example) To machine an R4.0 corner (using an R0.8 corner)



Corner Radius	Amount of Engagement	Radius Compensation
R0.4	0.02	+R0.04
R0.8	**0.03**	**+R0.07**
R1.2	0.08	+R0.18

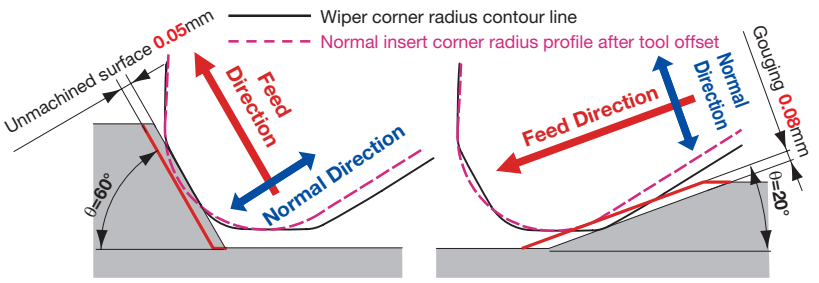
(3) Tool compensation for tapers (based on compensation in step (1))

When machining tapers, the programmed tool path may leave gouged or unmachined surfaces.
Make corrections in the normal direction as shown below.

Compensation + indicates gouging
Compensation - indicates unmachined surfaces.

Corner Radius	Taper Angle (θ)				
	-25°	**-20°**	-15°	-10°	-5°
R0.4	0.08	0.07	0.05	0.04	0.02
R0.8	0.09	**0.08**	0.06	0.05	0.02
R1.2	0.05	0.05	0.05	0.03	0.02

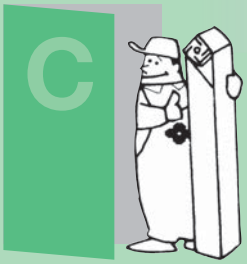
Example) To machine a 60°/-20° taper angle (θ) with a R0.8 corner radius



Corner Radius	Taper Angle (θ)																		
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	**60°**	65°	70°	75°	80°	85°	90°
R0.4	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.02	-0.02	-0.03	-0.03	-0.04	-0.05	-0.05	-0.05	-0.03	-0.02	-0.02	-0.01	0.00
R0.8	0.00	0.01	0.02	0.03	0.03	0.03	0.03	0.02	0.01	0.00	-0.02	-0.03	**-0.05**	-0.04	-0.03	-0.02	-0.01	0.00	0.00
R1.2	0.00	0.02	0.04	0.06	0.07	0.08	0.08	0.07	0.06	0.05	0.03	0.00	-0.03	-0.02	-0.01	0.00	0.01	0.00	0.00

External Holders C

C1 to C48



		SEC-External Tool Holder Series ····· C2
		SEC-External Holder Identification Table and Cutting Edge Position Dimensions ··· C4
		SEC-External Holder Clamp Structure ····· C6
		SEC-External Holders / Internal Coolant Holders ··· C8
Negative	CN□□ Insert Applicable Holders	DCLN-J type / DCLN type ····· C10
Negative	CN□□ Insert Applicable Holders	PCLN type ····· C11
Negative	CN□□ Insert Applicable Holders	PCBN type / PCFN type ····· C12
Positive	CC□□ Insert Applicable Holders	SCLC type ····· C13
Negative	DN□□ Insert Applicable Holders	DDJN-J type / DDJN type ····· C14
Negative	DN□□ Insert Applicable Holders	DDHN type / DDNN type ····· C15
Negative	DN□□ Insert Applicable Holders	PDJN type ····· C16
	T-REX Tool Holders	SumiTurn T-REX Tool Holders ····· C17
Positive	DC□□ Insert Applicable Holders	SDJC type ····· C19
Positive	RCM□ Insert Applicable Holders	PRGC type / PRDC type ····· C20
Negative	SN□□ Insert Applicable Holders	DSBN type / DSDN type ····· C21
Negative	SN□□ Insert Applicable Holders	DSSN type / PSBN type ····· C22
Negative	SN□□ Insert Applicable Holders	PSDN type ····· C23
Negative	SN□□ Insert Applicable Holders	PSSN type / PSKN type ····· C24
Negative	SN□□ Insert Applicable Holders	ESBN type / ESDN type ····· C25
Negative	SN□□ Insert Applicable Holders	ESSN type / ESKN type ····· C26
Positive	SP□□ Insert (Without Hole) Applicable Holders	CSRP type / CSDP type (FP11 type / 14 type) ····· C27
Positive	SP□□ Insert (Without Hole) Applicable Holders	CSKP type (FP15 type) ····· C28
Negative	TN□□ Insert Applicable Holders	DTGN type / DTFN type ····· C29
Negative	TN□□ Insert Applicable Holders	PTGN type / PTTN type ····· C30
Negative	TN□□ Insert Applicable Holders	PTFN type ····· C31
Negative	TN□□ Insert Applicable Holders	ETGN type / ETAN type ····· C32
Negative	TN□□ Insert Applicable Holders	ETFN type ····· C33
Negative	TN□□ Insert Applicable Holders	ETEN type / ETXN type ····· C34
Negative	TN□□ Insert Applicable Holders	MTJN type / MTXN type ····· C35
Positive	TP□□ Insert (Without Hole) Applicable Holders	CTGP type / CTAP type (FP22 type / 21 type) ····· C36
Positive	TP□□ Insert (Without Hole) Applicable Holders	CTFP type (FP25 type) ····· C37
Negative	VN□□ Insert Applicable Holders	DVJN-J type / DVJN type ····· C38
Negative	VN□□ Insert Applicable Holders	DVVN type / DVQN type ····· C39
Positive	VC□□ Insert Applicable Holders	SVLC type / SVJC type ····· C40
Positive	VC□□ Insert Applicable Holders	SVVC type / SVPC type ····· C41
Negative	WN□□ Insert Applicable Holders	DWLN-J type / DWLN type ····· C42
Negative	WN□□ Insert Applicable Holders	PWLN type / MWLN type ····· C43
Positive	For Aluminum Wheel Turning	Tool Holders for Aluminum Wheel Turning ····· C44
Positive	For Aluminum Wheel Turning	SEC-MV series Profiling Tool Holders ····· C45
Positive	For Aluminum Wheel Turning	SEC-GD series Profiling Tool Holders ····· C46
	Double Clamp Tool Holders	Clamp Set Parts ····· C48

Stock Markings and Symbols

●● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stocked (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

External Tool Holder Series

■ General Features

Since the development of the clamp-on SEC-2 type holders in 1959 and the cam-lock SEC-3 type the following year, Sumitomo Electric Hardmetal has had more than 60 years of experience in producing and developing indexable tools. Presently, Sumitomo Electric Hardmetal provides a wide variety of top quality external turning tools to satisfy any machining needs with reliable and consistent performance.

*SEC: Steady & Easy Clamp. The generic code for our indexable insert tools.

■ Tooling Selection

Applications		General Turning (Facing)		General Turning and Profiling		General Turning			
Insert Shape		80° Diamond type C		55° Diamond type D		Triangular type T			
Structure	Type								
Double Clamp	M series Tool Holders D series Tool Holders	DCLN-J (Internal Coolant) C10 DCLN C10	DDJN-J (Internal Coolant) C14 DDJN C14	DDHN C15	DDNN C15	DTGN C29	DTFN C29	MTJN C35	MTXN C35
	T-REX Tool Holders	–	–	DTR55C (SumiTurn T-REX) C17	DTR55Q (SumiTurn T-REX) C17	–	–	–	–
Pin Lock	30 series Tool Holders	–	–	–	–	ETGN C32 ETAN C32	ETFN C33	ETEN C34	ETXN C34
Lever Lock	70 series Tool Holders	PCLC (Back Clamp) D17 D22	PCLN C11	PDJC (Back Clamp) D18 D24	–	PTGN C30	PTTN C30	PTFN C31	PTXN D20
		PCBN C12	PCFN C12	PDJN C16	–	–	–	–	–
Screw-on	Mini Holders	SCLC C13 D17 D22	SCAC D17 D23	SDJC C19 D18 D24	SDAC D19 D25	STGC D27	STAC D27	–	–
		–	–	SDNC D25	SDPC D19	Clamp-on 40 series Tool Holders	CTGP/CTAP [FP22/FP21] C36	CTFP [FP25] C37	–

Figures in [ ] are previous model numbers and those in <> indicate the lead angle of the holder. Be careful of interference during turning.

(Back Clamp) Back Clamping (Internal Coolant) Internal Coolant Supply

External Tool Holder Series

■ Performance Comparison Table

Series	Clamp Mechanism						Rake Angle		Clamp Rigidity	Operability	Indexing Accuracy	Chip Control
	P Lever Lock	E Pin Lock	C Lever Lock	M Pin & Clamp-on	S Screw-on	D Double Clamp	Negative	Positive				
SumiTurn T-REX Tool Holders						○	○		◎	◎	◎	○
SEC-D series Holders						○	○		◎	◎	◎	○
SEC-70 series Holder	○						○		◎	◎	◎	◎
SEC-30 series Holder		○					○		△	○	△	◎
SEC-M series Holders				○			○		◎	◎	○	○
SUMIBORON PR series Holders	○							○	◎	◎	◎	◎

◎ mark: Very good (1st recommendation) ◎ mark: Very good ○ mark: Good △ mark: OK

■ Tooling Selection

Applications		General Turning	General Turning and Profiling		General Turning				Special Turning
Insert Shape		Trigon type W	35° Diamond type V		Square type S				Round type R
Structure	Type								
Double Clamp	M series Tool Holders / D series Tool Holders	MWLN C43	DVJN-J C38 DVJN C38	DVVN C39	DSBN C21	DSDN C21	DSSN C22	–	–
		DWLN-J C42 DWLN C42	DVQN C39	–	–	–	–	–	–
Pin Lock	30 series Tool Holders	–	–	–	ESBN C25	ESDN C25	ESSN C26	ESKN C26	–
Lever Lock	70 series Tool Holders	PWLN C43	–	–	PSBN C22	PSDN C23	PSSN C24	PSKN C24	PRGC C20
		–	–	–	–	–	–	–	PRDC C20
Screw-on	Mini Holders	–	SVPC C41 D28 D29 SVPP	SVLC C40 D28 D29 SVLP	SSBC D26	–	–	–	–
	SV series Profiling Tool Holders	–	SVJC C40 D20	SVVC C41	Clamp-on 40 series Tool Holders Roll Turning Tool Holder CSRP [FP11] C27		CSDP [FP14] C27	CSKP [FP15] C28	BNRN L139

Figures in [ ] are previous model numbers and those in <> indicate the lead angle of the holder. Be careful of interference during turning.

Back Clamp Back Clamping Internal Coolant Internal Coolant Supply

External Holder Identification Table

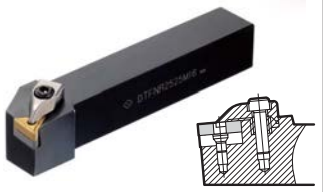
■ SEC-External Holder Cat. No. Identification Tables

Example: **D T F N R 25 25(-) M 16 (04 W)**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Clamping System Refer to Table 1	(2) Insert Shape Refer to Table 2	(3) Cutting Edge Shape Code Refer to Table 3	(4) Insert Relief Angle Refer to Table 4	(5) Feed Direction Refer to Table 5	(6) Shank Height Refer to Table 6	(7) Shank Width Refer to Table 7	(8) Shank Length Refer to Table 8	(9) Insert Cutting Edge Length B3 (Table 5) Previous cat. nos.: See Table 9	(10) Insert Thickness Refer to Table 10 Added only for holders with the same catalogue numbers but different insert thicknesses	(11) Shim Added only for holders with shims. Added only for holders with shims such as SEC-30/GD types.

● Example

DTFNR2525M16



- Structure: Double Clamp Method
- Shape: With Triangle Insert, Cutting Angle 91°
- Shank: H - 25mm, W - 25mm, L - 150mm

Table 1

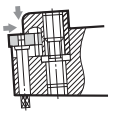
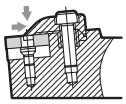
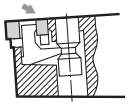
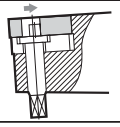
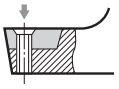
(1) Clamping System					
Symbol	Clamp	Structure	Symbol	Clamp	Structure
C	Clamp-on		M	Clamp-on + Pin Lock	
D	Double Clamp		P	Lever Lock (Insert is supported by 2 faces)	
E	Pin Lock (Insert is supported by 1 face)		S	Screw-on	

Table 2

(2) Insert Shape			
Symbol	Insert Shape	Symbol	Insert Shape
A	85° Apex Angle Parallellogram	M	86° Apex Angle Diamond type
B	82° Apex Angle Parallellogram	O	Octagonal type
C	80° Apex Angle Diamond type	P	Pentagonal type
D	55° Apex Angle Diamond type	R	Round type
E	75° Apex Angle Diamond type	S	Square type
F	50° Apex Angle Diamond type	T	Triangular type
H	Hexagonal type	V	35° Apex Angle Diamond type
K	55° Apex Angle Parallellogram	W	Trigon type
L	Rectangular type		

Table 4

(4) Insert Relief Angle	
Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Special Relief Angle

Table 5

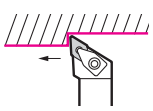
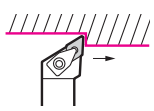
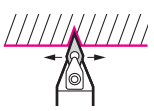
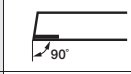
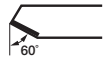
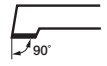
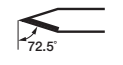
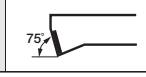
(5) Feed Direction					
Symbol	Right Hand	Symbol	Left Hand	Symbol	Neutral
R		L		N	

Table 3

(3) Cutting Edge Shape Code (▬ indicates main cutting edge)					
Symbol	Shape	Offset	Symbol	Shape	Offset
A*		No	L		Yes
B		No	N		No
D		No	R		Yes
E		No	S		Yes
F*		Yes	T		Yes
G*		Yes	U		Yes
J		Yes	V		No
K		Yes	Y		Yes

* 91° on our products

Table 6

(6) Shank Height	
Symbol	Height (mm)
12	12
16	16
20	20
25	25
32	32
40	40
50	50

2 digits are used for shank height and width dimensions in mm.

Table 7

(7) Shank Width	
Symbol	Width (mm)
12	12
16	16
20	20
25	25
32	32
40	40
50	50

Table 8

(8) Shank Length	
Symbol	Length (mm)
F	80
H	100
K	125
M	150
N	160
P	170
Q	180
S	250
T	300
U	350

For some previous catalogue numbers, a hyphen (-) is used instead of a letter.

Table 9: Applicable for previous cat. nos. only

Insert Inscribed Circle	
Symbol	Inscribed Circle (mm)
3	9.525
4	12.70
5	15.875
6	19.05
8	25.40

+

Insert Thickness	
Symbol	Thickness (mm)
2	3.18
3	4.76
4	6.35
5	7.94
6	9.52

In previous cat. nos., the inscribed circle and insert thickness symbols are combined and displayed as a 2 digit code.

For Round type Inserts

Symbol	Inscribed Circle (mm)
10	10
12	12
16	16
20	20
25	25
32	32

Table 10

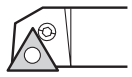
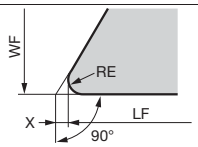
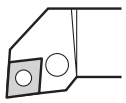
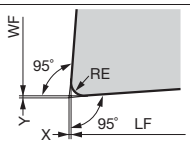
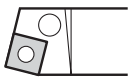
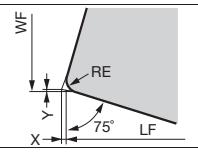
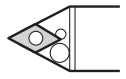
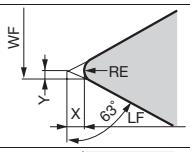
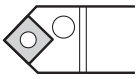
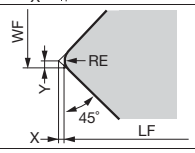
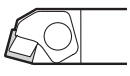
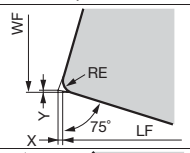
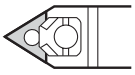
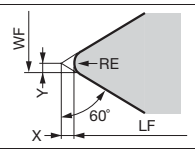
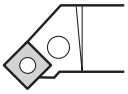
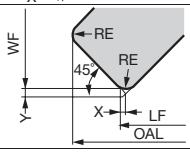
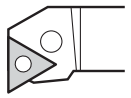
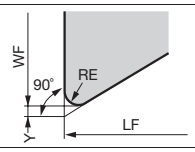
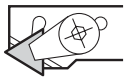
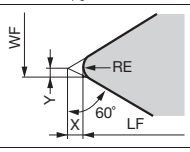
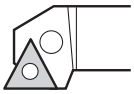
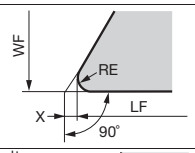
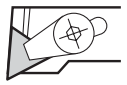
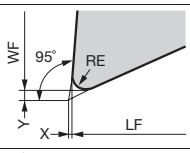
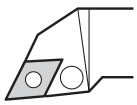
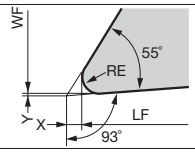
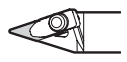
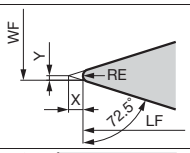
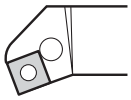
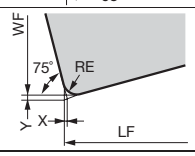
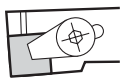
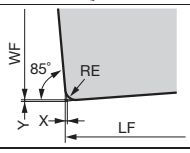
(10) Insert Thickness			
Symbol	Thickness (mm)	Symbol	Thickness (mm)
X1	1.40/1.80*	04	4.76
01	1.59	05	5.56
02	2.38	06	6.35
T2	2.78	07	7.94
03	3.18	09	9.52
T3	3.97		

*CCET03X1→1.40, CCET04X1→1.80

Cutting Edge Position Dimensions

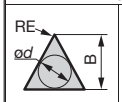
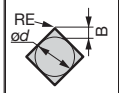
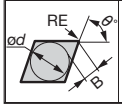
■ Cutting Position Dimensions and Corner Radius

● Cutting position dimensions by corner radius (ISO standard) (Values for X and Y in the table are with lateral rake angle and cutting edge inclination angle of 0°.)

Tool Shape			Dimensions (mm)			Tool Shape			Dimensions (mm)		
Symbol	Shape	Close-up of Cutting Edge	RE	X	Y	Symbol	Shape	Close-up of Cutting Edge	RE	X	Y
A			0.4	0.291	—	L			0.4	0.040	0.040
			0.8	0.581	—				0.8	0.079	0.079
			1.2	0.872	—				1.2	0.119	0.119
			1.6	1.162	—				1.6	0.159	0.159
			2.4	1.743	—				2.4	0.238	0.238
B			0.4	0.089	0.024	N			0.4	0.463	0.263
			0.8	0.178	0.048				0.8	0.925	0.471
			1.2	0.268	0.072				1.2	1.388	0.707
			1.6	0.357	0.096				1.6	1.850	0.943
			2.4	0.535	0.143				2.4	2.776	1.414
D			0.4	0.164	0.164	R			0.4	0.089	0.024
			0.8	0.329	0.329				0.8	0.178	0.048
			1.2	0.493	0.493				1.2	0.268	0.072
			1.6	0.658	0.658				1.6	0.357	0.096
			2.4	0.986	0.986				2.4	0.535	0.143
E			0.4	0.396	0.229	S			0.4	0.164	0.164
			0.8	0.793	0.458				0.8	0.329	0.329
			1.2	1.190	0.687				1.2	0.493	0.493
			1.6	1.587	0.916				1.6	0.658	0.658
			2.4	2.381	1.374				2.4	0.986	0.986
F			0.4	—	0.291	T			0.4	0.396	0.229
			0.8	—	0.581				0.8	0.793	0.458
			1.2	—	0.872				1.2	1.190	0.687
			1.6	—	1.162				1.6	1.587	0.916
			2.4	—	1.743				2.4	2.381	1.374
G			0.4	0.291	—	U			0.4	0.253	0.058
			0.8	0.581	—				0.8	0.506	0.116
			1.2	0.872	—				1.2	0.759	0.175
			1.6	1.162	—				1.6	1.013	0.233
			2.4	1.743	—				2.4	1.519	0.350
J			0.4	0.344	0.033	V			0.4	0.923	0.291
			0.8	0.687	0.079				0.8	1.846	0.582
			1.2	1.031	0.118				1.2	2.770	0.873
			1.6	1.375	0.157				1.6	3.693	1.164
			2.4	2.062	0.236				2.4	5.537	1.746
K			0.4	0.024	0.089	Y			0.4	0.002	0.033
			0.8	0.048	0.178				0.8	0.005	0.066
			1.2	0.072	0.268				1.2	0.008	0.099
			1.6	0.096	0.357				1.6	0.011	0.132
			2.4	0.143	0.535				2.4	0.017	0.198

● Corner radius position calculation

Calculation Formula for Corner Radius Position (mm)

Shape		Formula
	Triangular type	B = 3/2*d* - RE
	Square type	B = ($\sqrt{2}$ - 1) x (*d*/2 - RE)
	Diamond type	B = (1/Sin(θ°/2) - 1) x (*d*/2 - RE)

Values of **IC** and **RE** for the Calculation of B (mm)

Inscribed Circle Nominal Value	IC for Calculation
3.97	3.9688
4.76	4.7625
5.56	5.5562
6.35	6.3500
7.94	7.9375
9.525	9.5250
12.70	12.7000
15.875	15.8750
19.05	19.0500
25.40	25.4000

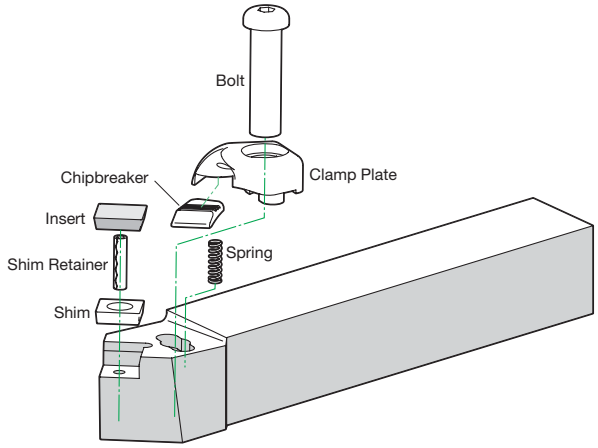
Corner Radius	Nominal Value	RE for Calculation
02	0.2	0.203
04	0.4	0.397
08	0.8	0.794
12	1.2	1.191
16	1.6	1.588
24	2.4	2.381

SEC-External Holder Clamp Structure

■ SEC-External Holder Clamp Structure List (Examples)

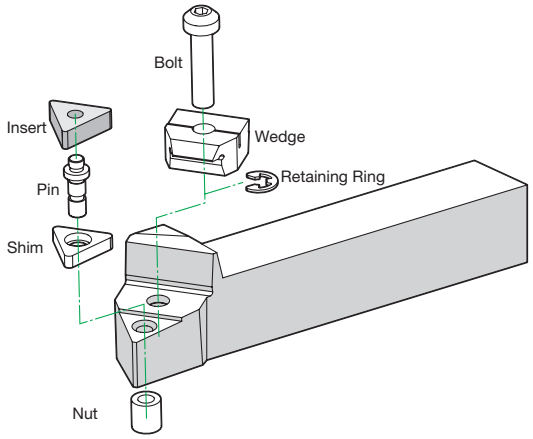
C Clamp-on

CSRP type / CSDP type / CSKP type / CTGP type / CTAP type / CTFP type



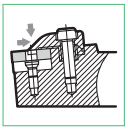
M Top Clamp + Pin Lock

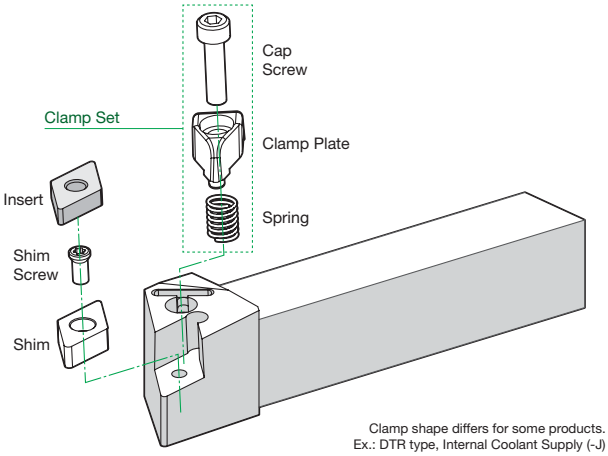
MTJN type / MTXN type / MWLN type



D Double Clamp

DCLN(-J) type / DDJN(-J) type / DDHN type / DDNN type
DSBN type / DSDN type / DSSN type / DTGN type / DTFN type
DVJN(-J) type / DVVN type / DVQN type / DWLN(-J) type / DTR type (T-REX)

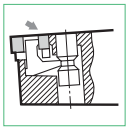


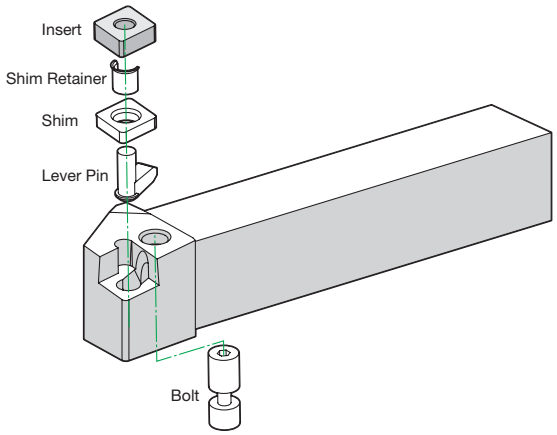


Clamp shape differs for some products.
Ex.: DTR type, Internal Coolant Supply (-J)

P Lever Lock

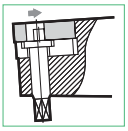
PCLN type / PCBN type / PCFN type / PDJN type
PRGC type / PRDC type / PSBN type / PSDN type / PSSN type / PSKN type
PTGN type / PTTN type / PTFN type / PWLN type

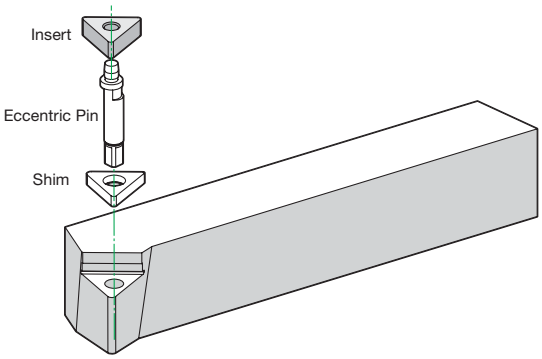




E Pin Lock

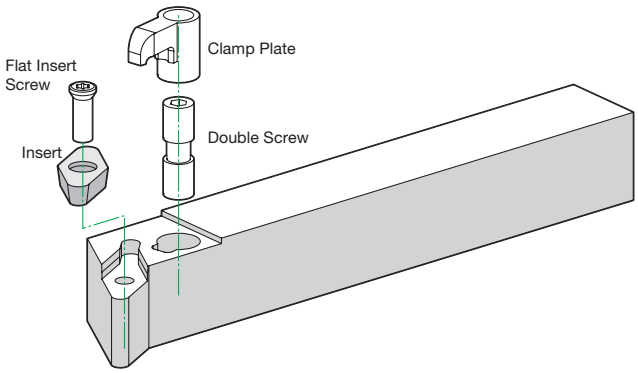
ESBN type / ESDN type / ESSN type / ESKN type
ETGN type / ETAN type / ETFN type / ETEN type / ETXN type





Screw-on + Clamp-on

MVXC type Profiling Tool Holders / MVPC type Profiling Tool Holders



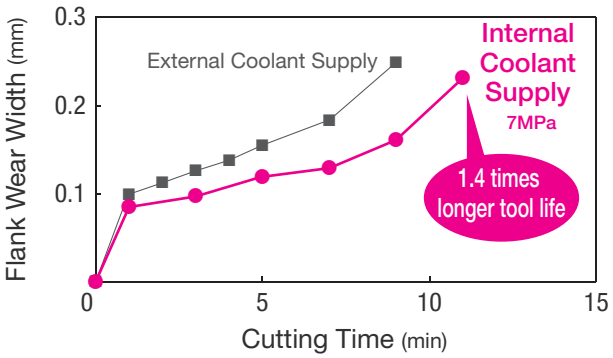
MEMO

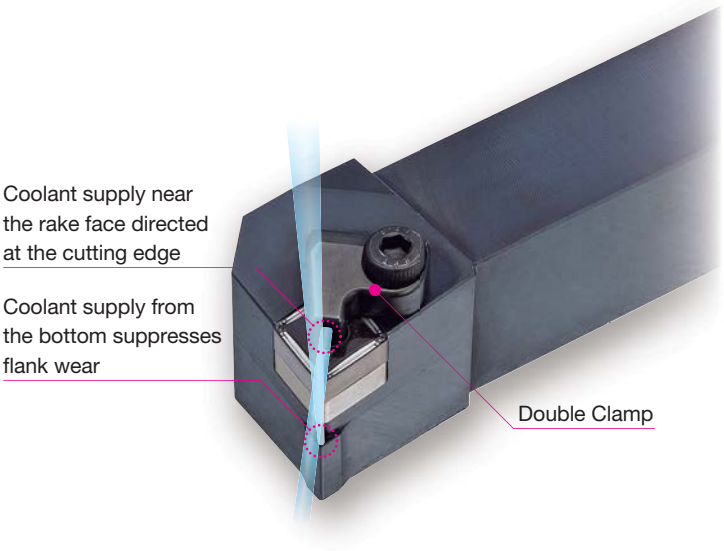
Internal Coolant Holders

■ Features

- Through-clamp internal coolant supply holder improves chip evacuation and tool life
- Enables directed coolant supply from a close range, towards the cutting edge
- Suppresses flank wear with additional coolant supply to the flank face
- Realises high rigidity and indexing accuracy with double clamping
- 1st recommendation for external holder selection

■ Wear Resistance

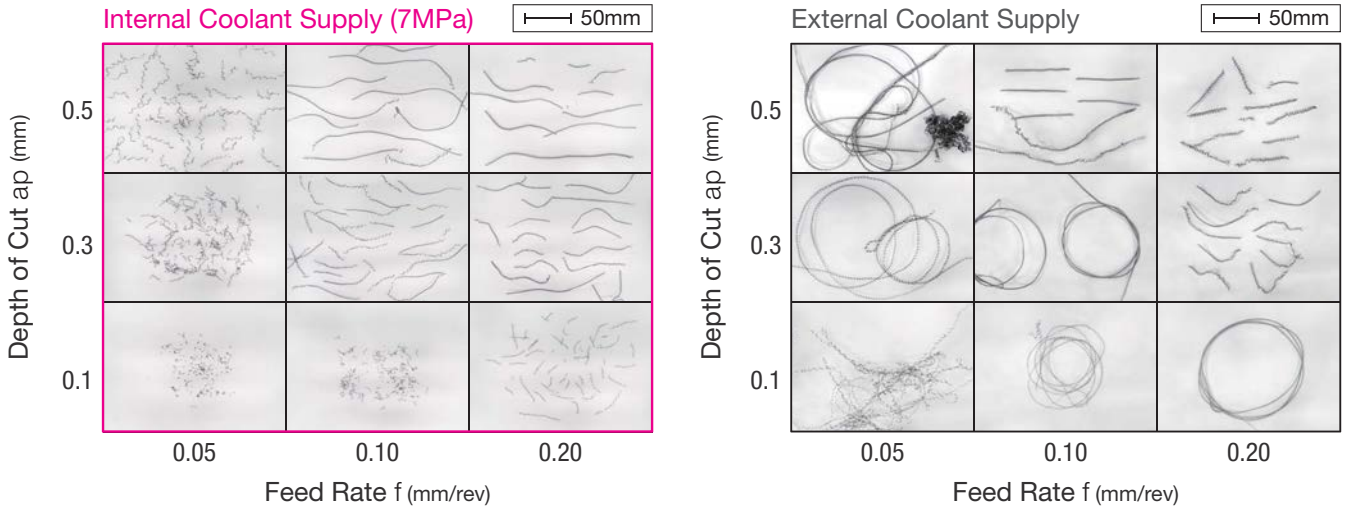




Work Material: SUS316 Holder: DDJN R2525K15-J Insert: DNMG150408N-FE Cutting Conditions: vc = 300m/min f = 0.1mm/rev ap = 0.5mm Wet

*Evaluated under high-speed cutting conditions due to accelerated testing.

■ Chip Evacuation



Work Material: SCM415 Holder: DDJN R2525K15-J Insert: DNMG150408N-FE Cutting Conditions: vc = 300m/min Wet

Internal Coolant Holders

■ Parts for Internal Coolant Holder Piping

Fig 1

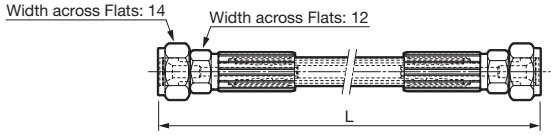


Fig 1

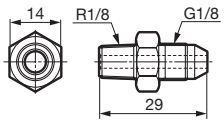
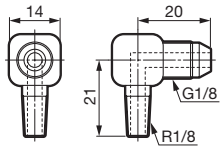


Fig 2



Parts (Hose)

Dimensions (mm)

Cat. No.	Stock	L	Screw Standard	Screw Standard	Fig
J-HOSE-G1/8-G1/8-200	●	200	G1/8	G1/8	1
J-HOSE-G1/8-G1/8-300	●	300	G1/8	G1/8	1

Hoses are sold separately.

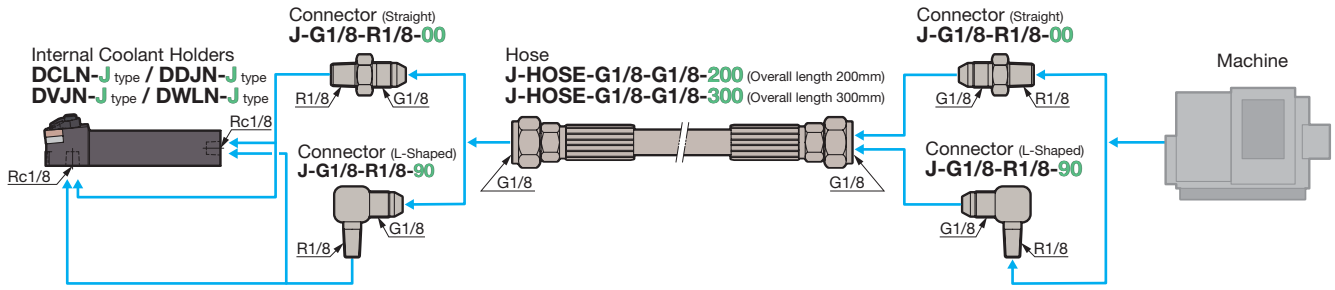
Parts (Connector)

Dimensions (mm)

Cat. No.	Stock	Screw Standard	Screw Standard	Fig
J-G1/8-R1/8-00	●	G1/8	R1/8	1
J-G1/8-R1/8-90	●	G1/8	R1/8	2

Connectors are sold separately.

■ Piping Method for Hoses and Connectors



- Apply sealant such as commercial sealing tape to the piping connection parts.
- Internal coolant holders have a plug (XP02) mounted on the holder back end at shipping. (See Fig 1)
  When piping from the holder back end, mount a plug (XP02) on the bottom of the holder for use. (See Fig 2)

Fig 1 Piping from bottom (at shipping)

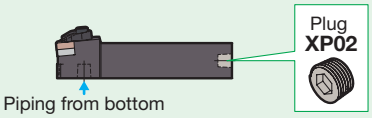
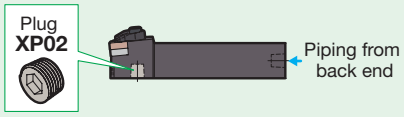


Fig 2 Piping from back end



Precautions for SEC-External Holders / Internal Coolant Holders

■ Insert Removal Precautions

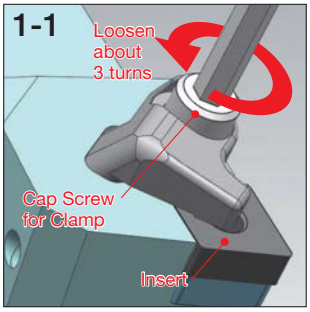
- Use a wrench to loosen the cap screw for clamp by about three turns, and then remove the insert. (Fig 1-1 below)
- If the clamp plate tip catches on the insert when removing, push the clamp plate in the arrow direction as in Fig 1-2 below.

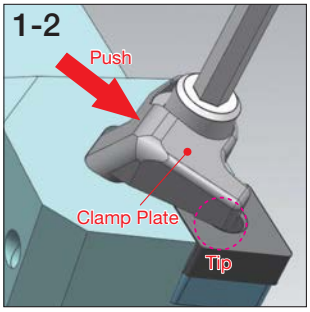
■ Precautions for Removing and Assembling O-Rings and Clamps

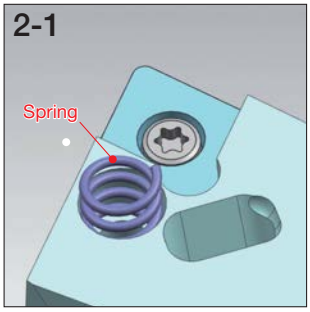
- O-rings are consumable parts. If worn or damage, replace with a new O-ring as stipulated.
- When replacing, remove the cap screw and then remove the clamp from the body. (Be careful not to lose the spring).
  Remove the old O-ring from the clamp plate, clean the clamp plate groove, and then set the new O-ring so that it fits entirely into the groove.
- When setting the clamp plate, as in Fig 2-1 below, place the spring and then set and tighten the clamp plate and cap screw to mount the clamp plate on the body. (Fig 2-2 below) Be careful at this point that the O-ring does not protrude.
- When mounting the clamp plate, do not tighten the cap screw forcefully all the way to the bottom without setting the insert.

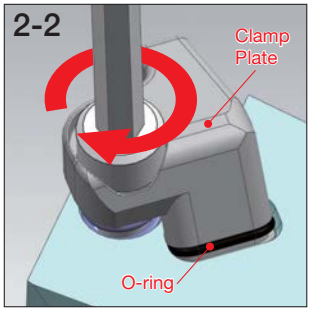
■ Others

- Coolant pressure supports up to max. 15MPa.
- To maximize coolant effects on the flank and prevent holder interference, use with an insert of corner radius RE0.4 to 1.2mm.

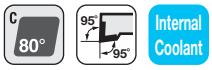








DCLN-J type / DCLN type



SEC-D series Holder - General Turning, Facing and Profiling
Internal Coolant Supply Double Clamp

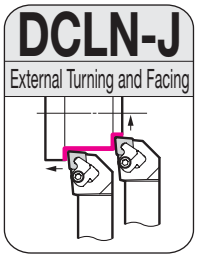


Fig 1

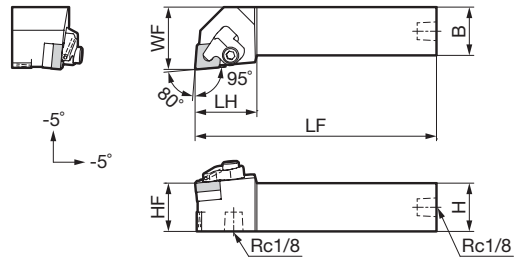


Figure shows right-handed (R) tool.

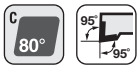
Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Insert		Fig	Clamp Plate	Cap Screw		Spring	O-ring	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Plug
	R	L	H	B	LF	WF	HF	LH	Cat. No.	Ref. Page				N·m					(For Torx hole)	For Hexagonal hole	For Hexagonal hole	
DCLN R/L2020K12-J	●	●	20	20	125	25	20	32	CN□□1204	**B16~**	1	JC R/L-01	CP-M5-20-1	**5.0**	CSP12J	SS060	CNS1204	BFTX0409N	TRX15(*)	LH040	LH025	XP02
DCLN R/L2525K12-J	●	●	25	25	125	32	25	32														

*Wrench for shim is sold separately from the main body.



SEC-D series Holder - General Turning, Facing and Profiling
Double Clamp

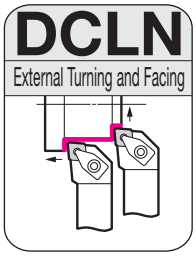


Fig 1

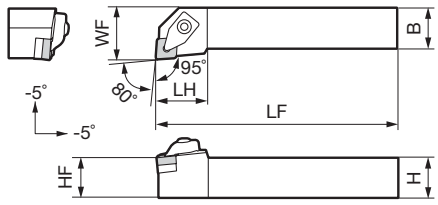


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Inserts		Fig	Clamp Set		Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench
	R	L	H	B	LF	WF	HF	LH	Cat. No.	Ref. Page			N·m			(For Torx hole)	(For Hexagonal hole)	(For Hexagonal hole)
DCLN R/L2020K12	●	●	20	20	125	25	20	32	CN□□1204	**B16~**	1	SCP-2	**5.0**	CNS1204	BFTX0409N	TRX15(*)	LH040	LH025
DCLN R/L2525M12	●	●	25	25	150	32	25	32			1							
DCLN R/L2525M16	●	●	25	25	150	32	25	32	CN□□1606	**B20~**	1	SCP-3	**5.0**	CNS1606	BFTX0509N	TRX20(*)	LH040	LH025
DCLN R/L3232P16	●	●	32	32	170	40	32	32			1							
DCLN R/L3232P19	●	●	32	32	170	40	32	42	CN□□1906	**B22~**	1	SCP-5	**5.0**	CNS1906	BFTX0511N	TRX20(*)	LH040	LH025
DCLN R/L4040S19	●	●	40	40	250	50	40	42			1							
DCLN R/L4040S25	●	●	40	40	250	50	40	53	CN□□2509	**B24**	1	SCP-6	**6.0**	CNS2509	BFTX0615N	TRD25(*)	LH060	—

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

Note: The values in red (cutting edge WF) have been changed from those in the 2021-2022 General Catalogue.

N·m Recommended Tightening Torque (N·m)

PCLN type

SEC-70 Holder - General Turning, Facing and Profiling
Lever Lock

PCLN
External Turning and Facing

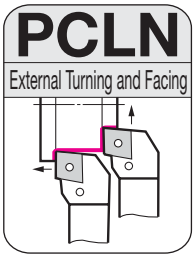


Fig 1

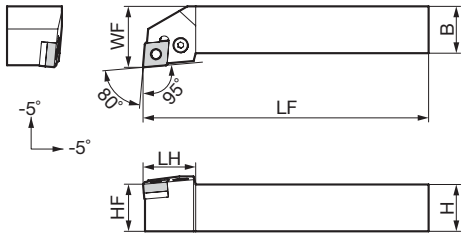


Figure shows right-handed (R) tool.

Fig 2

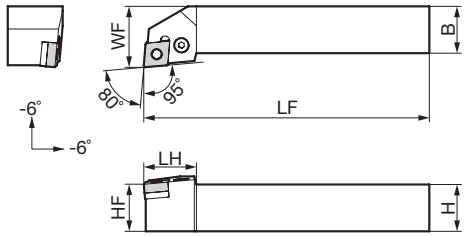


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
PCLN R/L1616H0903	PCLN R/L1616-32	●	●	16	16	100	20	16	20	CN□□0903	**B14**	1	LCL3	LCS3	LSC32	LSP3	LH025
PCLN R/L2020K0904	PCLN R/L2020-33	●	●	20	20	125	25	20	20	CN□□0904	**B15**	1	LCL3	LCS3	LSC317	LSP3	LH025
PCLN R/L2525M0904	PCLN R/L2525-33	●	●	25	25	150	32	25	20			1					
PCLN R/L2020K12	PCLN R/L2020-43	●	●	20	20	125	25	20	28	CN□□1204	**B16~**	1	LCL4	LCS4	LSC42	LSP4	LH030
PCLN R/L2520M12	PCLN R/L2520-43			25	20	150	25	25	28			1					
PCLN R/L2525M12	PCLN R/L2525-43	●	●	25	25	150	32	25	28			1					
PCLN R/L3225P12	PCLN R/L3225-43	●	●	32	25	170	32	32	28			1					
PCLN R/L3232P12	PCLN R/L3232-43	●	●	32	32	170	40	32	28			1					
PCLN R/L2525M16	PCLN R/L2525-54	●	●	25	25	150	32	25	33	CN□□1606	**B20~**	1	LCL5	LCS5	LSC53	LSP5	LH030
PCLN R/L3225P16	PCLN R/L3225-54			32	25	170	32	32	33			1					
PCLN R/L3232P16	PCLN R/L3232-54	●	●	32	32	170	40	32	33			1					
PCLN R/L3225P19	PCLN R/L3225-64	●	●	32	25	170	32	32	38	CN□□1906	**B22~**	1	LCL6	LCS6	LSC63	LSP6	LH040
PCLN R/L3232P19	PCLN R/L3232-64	●	●	32	32	170	40	32	38			2					
PCLN R/L4040R19	PCLN R/L4040-64	●	●	40	40	200	50	40	38			2					

Applicable Inserts ◂·· DCLN-J type / DCLN type / PCLN type / PCBN type / PCFN type

1st Recommended Insert

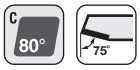
- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD — GU; Photo; Grade — AC8025P

Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2115	SUMIBORON BN1000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	—	SUMIBORON BNC300	SUMIBORON BN350
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~		☞ A20~	

BNC500 is for ductile cast iron.

PCBN type / PCFN type



SEC-70 Holder - General Turning
Lever Lock

PCBN
External Turning

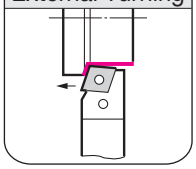


Fig 1

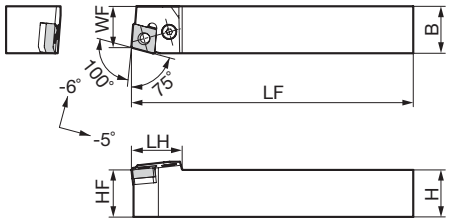


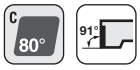
Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
																	(For Hexagonal hole)
PCBN R/L2020K12	PCBN R/L2020-43	●	●	20	20	125	17	20	27	CN□□1204	**B16~**	1	LCL4	LCS4	LSC42	LSP4	LH030
PCBN R/L2520M12	PCBN R/L2520-43			25	20	150	17	25	27			1					
PCBN R/L2525M12	PCBN R/L2525-43	●	●	25	25	150	22	25	27			1					
PCBN R/L3225P12	PCBN R/L3225-43			32	25	170	22	32	27			1					
PCBN R/L2525M16	PCBN R/L2525-54			25	25	150	22	25	33	CN□□1606	**B20~**	1	LCL5	LCS5	LSC53	LSP5	LH030
PCBN R/L3225P16	PCBN R/L3225-54			32	25	170	22	32	33			1					
PCBN R/L3232P16	PCBN R/L3232-54			32	32	170	27	32	33			1					
PCBN R/L3232P19	PCBN R/L3232-64			32	32	170	27	32	38	CN□□1906	**B22~**	1	LCL6	LCS6	LSC63	LSP6	LH040
PCBN R/L4040R19	PCBN R/L4040-64			40	40	200	35	40	38			1					



SEC-70 series Holder - General Turning, Facing and Profiling
Lever Lock

PCFN
Facing

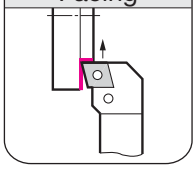


Fig 1

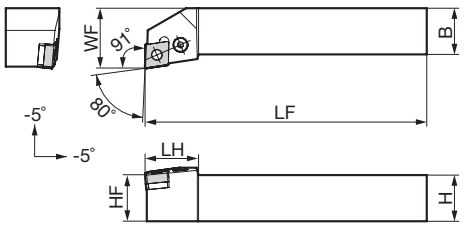


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

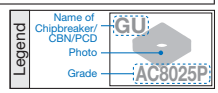
Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
																	(For Hexagonal hole)
PCFN R/L2020K12	PCFN R/L2020-43	●	●	20	20	125	25	20	28	CN□□1204	**B16~**	1	LCL4	LCS4	LSC42	LSP4	LH030
PCFN R/L2520M12	PCFN R/L2520-43			25	20	150	25	25	28			1					
PCFN R/L2525M12	PCFN R/L2525-43	●	●	25	25	150	32	25	28			1					
PCFN R/L3225P12	PCFN R/L3225-43			32	25	170	32	32	28			1					

When using handed breaker inserts for facing, the holder and insert are opposite handed.

Applicable Inserts ◂·· DCLN-J type / DCLN type / PCLN type / PCBN type / PCFN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2115	SUMIBORON BN1000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	—	SUMIBORON BNC300	SUMIBORON BN350
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~		☞ A20~	

BNC500 is for ductile cast iron.

SCLC type

SEC-SC Holder - General Turning and Facing
Screw-on

SumiSmall

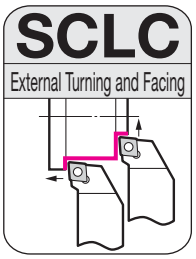


Fig 1

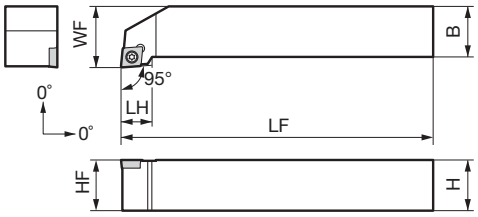


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SCLC R/L0808H06	SCLC R/L0808-06	●	●	8	8	100	10	8	—	CC□□0602	**B70~**	1	BFTX02506N	**1.5**	TRX08
SCLC R/L1010H06	SCLC R/L1010-06	●	●	10	10	100	12	10	15			1			
SCLC R/L1212H09	SCLC R/L1212-09	●	●	12	12	100	16	12	15	CC□□09T3	**B73~**	1	BFTX0409N	**3.4**	TRX15
SCLC R/L1616H09	SCLC R/L1616-09	●	●	16	16	100	20	16	15			1			
SCLC R/L2020K09	SCLC R/L2020-09	●	●	20	20	125	25	20	15			1			
SCLC R/L2525M09	SCLC R/L2525M09	●	●	25	25	150	30	25	15			1			

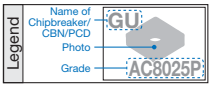
When using handed breaker inserts for facing, the holder and insert are opposite handed.

Note: The values in red (cutting edge WF) have been changed from those in the 2021-2022 General Catalogue.

Applicable Inserts ◂·· SCLC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material —
General Machining	FB **T1500Z**	GU **AC8025P**	MU **AC8025P**	LB **AC6030M**	GU **AC6030M**	MU **AC6040M**	SUMIBORON BN7125/BNC500	MU **AC4015K**	No Chipbreaker **AC4015K**	SU **AC5015S**	SUMIDIA **DA1000**	AG **H1**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**	SUMIDIA **DA90**
High-precision	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	SUMIBORON BN7125/BNC500	—	—	SI **AC5015S**	SUMIDIA **DA1000**	—	SUMIBORON **BNC2115**	SUMIBORON **BN1000**	SUMIDIA BINDERLESS **NPD10**
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~	☞ A22~		☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

DDJN-J type / DDJN type

SEC-D series Holder - General Turning and Profiling
Internal Coolant Supply Double Clamp

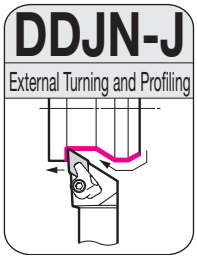


Fig 1

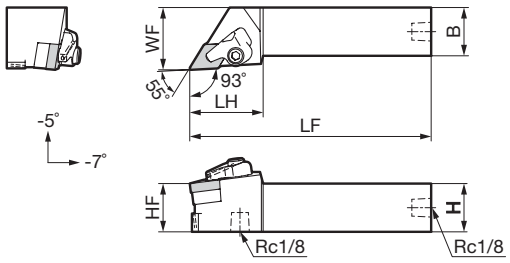


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Plate	Cap Screw	Cap Screw N·m	Spring	O-ring	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Plug
																			(For Torx hole)	For Hexagonal hole	For Hexagonal hole	
DDJN R/L2020K15-J	●	●	20	20	125	25	20	38	DN□□1504	**B26~**	1	JD R/L-01	CP-M5-20-1	**5.0**	CSP12J	SS060	DNS1504	BFTX0409N	TRX15(*)	LH040	LH025	XP02
DDJN R/L2525K15-J	●	●	25	25	125	32	25	38														
DDJN R/L2525K15E-J	●	●	25	25	125	32	25	38	DN□□1506	**B30~**	1	JD R/L-01	CP-M5-20-1	**5.0**	CSP12J	SS060	DNS1506	BFTX0409N	TRX15(*)	LH040	LH025	XP02

*Wrench for shim is sold separately from the main body.

SEC-D Holder - General Turning and Profiling
Double Clamp

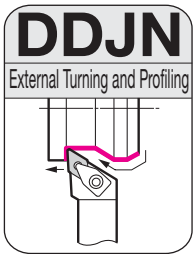


Fig 1

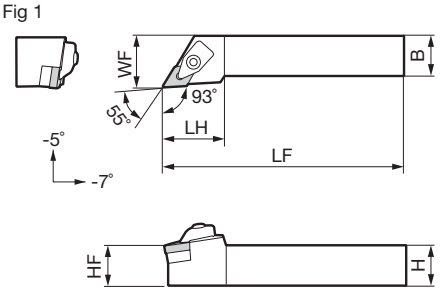


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench
																(For Torx hole)	(For Hexagonal hole)	(For Hexagonal hole)
DDJN R/L2020K15	●	●	20	20	125	25	20	38	DN□□1504	**B26~**	1	SCP-2	**5.0**	DNS1504	BFTX0409N	TRX15(*)	LH040	LH025
DDJN R/L2525M15	●	●	25	25	150	32	25	38			1							
DDJN R/L2525M15E	●	●	25	25	150	32	25	38	DN□□1506	**B30~**	1	SCP-2	**5.0**	DNS1506	BFTX0409N	TRX15(*)	LH040	LH025

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

Note: The values in red (cutting edge WF) have been changed from those in the 2021-2022 General Catalogue.

N·m Recommended Tightening Torque (N·m)

DDHN type / DDNN type

SEC-D series Holder - General Turning and Profiling
Double Clamp

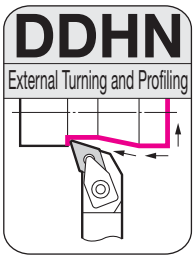


Fig 1

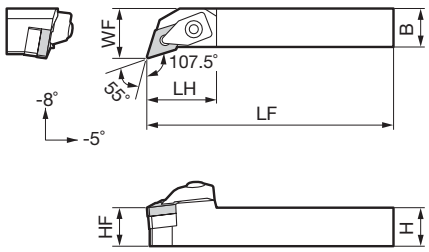


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim (For Torx hole)	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
DDHN R/L2020K15	●	●	20	20	125	25	20	35	DN□□1504	B26~	1	SCP-2	5.0	DNS1504	BFTX0409N	TRX15(*)	LH040	LH025
DDHN R/L2525M15	●	●	25	25	150	32	25	35			1							

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

SEC-D series Holder - General Turning and Profiling
Double Clamp

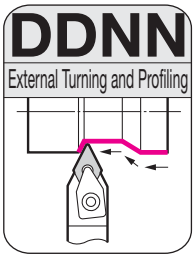


Fig 1

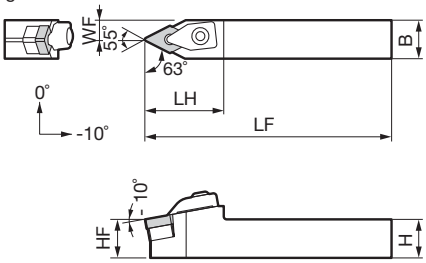
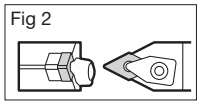


Fig 2



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim (For Torx hole)	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
DDNN N2020K15	●	20	20	125	10.5	20	40	DN□□1504	B26~	1	SCP-2	5.0	DNS1504	BFTX0409N	TRX15(*)	LH040	LH025
DDNN N2525M15	●	25	25	150	13.0	25	40			2							

*Wrench for shim is sold separately from the main body.

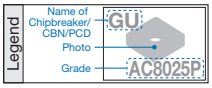
Clamp Set Parts C48

Applicable Inserts

DDJN-J type / DDJN type / DDHN type / DDNN type / PDJN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	—	SUMIBORON BNC300	SUMIBORON BN350	—
Recommended Cutting Conditions	A10~			A14~			A16~			A18~			A22~		A20~		M2~

PDJN type

SEC-70 Holder - General Turning and Profiling
Lever Lock

PDJN
External/Profiling

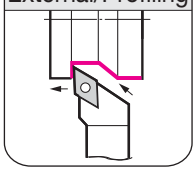


Fig 1

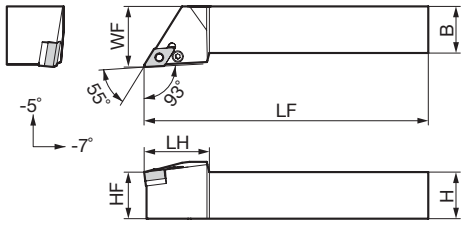


Figure shows right-handed (R) tool.

Holder

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig
PDJN R/L2020K11	PDJN R/L2020-33	●	●	20	20	125	25	20	25	DN□□1104	**B25~**	1
PDJN R/L2525M11	PDJN R/L2525-33	●	●	25	25	150	32	25	25			1
PDJN R/L2020K1504	PDJN R/L2020-43	●	●	20	20	125	25	20	35	DN□□1504	**B26~**	1
PDJN R/L2525M1504	PDJN R/L2525-43	●	●	25	25	150	32	25	35			1
PDJN R/L3225P1504	PDJN R/L3225-43			32	25	170	32	32	35			1
PDJN R/L3232P1504	PDJN R/L3232-43	●	●	32	32	170	40	32	35			1
PDJN R/L2525M1506	PDJN R/L2525-44	●	●	25	25	150	32	25	35	DN□□1506	**B30~**	1
PDJN R/L3225P1506	PDJN R/L3225-44			32	25	170	32	32	35			1
PDJN R/L3232P1506	PDJN R/L3232-44			32	32	170	40	32	35			1

Parts

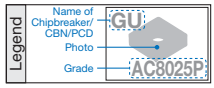
Lever Pin	Bolt	Shim	Shim Retainer	Wrench
				(For Hexagonal hole)
LCL3	LCS3	LSD317	LSP3	LH025
LCL4	LCS4	LSD42	LSP4	LH030
LCL4	LCS4	LSD42	LSP4	LH030

Applicable Inserts

◀·· **DDJN-J type / DDJN type / DDHN type / DDNN type / PDJN type**

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	—	SUMIBORON BNC300	SUMIBORON BN350	—
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~		☞ A20~		☞ M2~

T-REX Tool Holders

External Profiling
Double Clamp

DTR55C

External Turning and Profiling

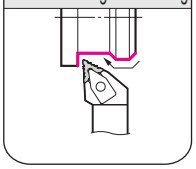


Fig 1

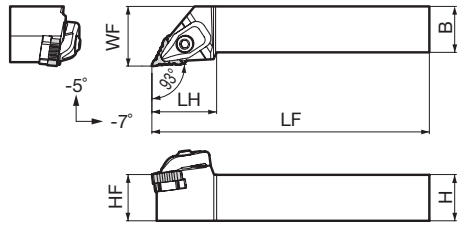


Figure shows right-handed (R) tool.

SumiTurn T-REX

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Fig	Clamp Plate	Spring	Cap Screw	Cap Screw N·m	Shim	Shim Screw	Wrench (For Hexagonal hole)	Wrench for Shim (For Torx hole)
DTR55C R/L2020-K17	●	●	20	20	125	25	20	35	1	TRCP3	S-SP4-20	BX0520	3.5 to 4.5	TRW5505	BFTX0307N	TSW040	TRX10(*)
DTR55C R/L2525-M17	●	●	25	25	150	32	25	35	1								

*Wrench for shim is sold separately from the main body.

S-DTR55C type: Internal Profiling E34

External Profiling
Double Clamp

DTR55Q

External Turning and Face Profiling

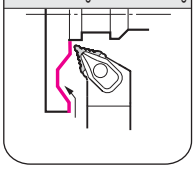


Fig 1

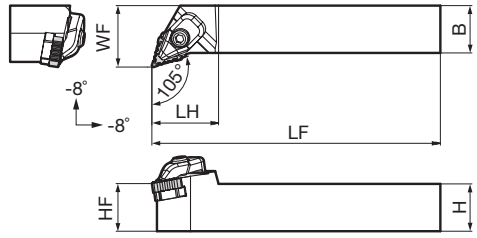


Figure shows right-handed (R) tool.

SumiTurn T-REX

Holder

Parts

Dimensions (mm)

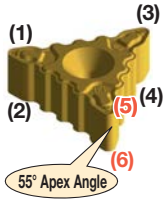
Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Fig	Clamp Plate	Spring	Cap Screw	Cap Screw N·m	Shim	Shim Screw	Wrench (For Hexagonal hole)	Wrench for Shim (For Torx hole)
DTR55Q R/L2020-K17	●	●	20	20	125	28.5	20	35	1	TRCP3	S-SP4-20	BX0520	3.5 to 4.5	TRW5505	BFTX0307N	TSW040	TRX10(*)
DTR55Q R/L2525-M17	●	●	25	25	150	32.0	25	35	1								

*Wrench for shim is sold separately from the main body.

■ Features

● 55° Apex Angle with 6 Cutting Edges

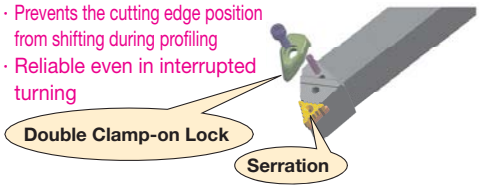
1.5 times more cutting edges compared to DNMG inserts, for greatly reduced machining costs



● Extra-Strong Clamping

Powerful clamping with double clamp-on lock and serrated insert design

- Prevents the cutting edge position from shifting during profiling
- Reliable even in interrupted turning



● T-REX Insert/Tool Holder Identification

Insert

TRM 55 17 08 -GU

TRM: T-REX Insert; 55: Apex Angle; 17: Insert Size; 08: Corner Radius; -GU: Name of Chipbreaker

External Holder

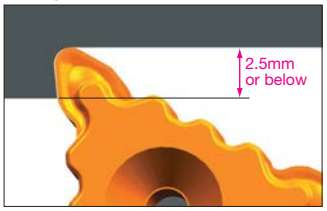
DTR 55 C R 2525 -M 17

DTR: T-REX Holders; 55: Apex Angle; C: Cutting Edge Angle; R: Feed Direction; 2525: Shank Size; -M: Shank Length; 17: Insert Size

Note: Cutting Edge Angle
C: 93° (95.5° for main cutting edge)
Q: 105° (107.5° for main cutting edge)

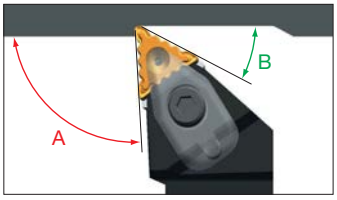
■ Important Notes

● Depth of Cut



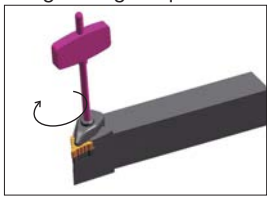
Maximum depth of cut should be 2.5mm.

● Cutting Edge Angle



Holder Cat. No.	A	B	Note
DTR55C type	93°	27°	Main cutting edge angle is 95.5°
DTR55Q type	105°	15°	Main cutting edge angle is 107.5°

● Tightening Torque



For the insert clamp, use the included dedicated wrench (TSW040) to tighten at 3.5 to 4.5N·m torque.

N·m Recommended Tightening Torque (N·m)

T-REX Tool Holders

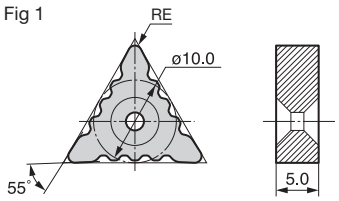
TRM 55°

Insert (Coated Carbide / Cermet)

Dimensions (mm)

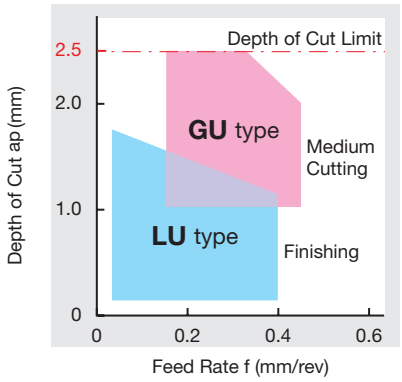
Applications	Appearance	Cat. No.	Corner Radius RE	AC810P	AC8025P	AC820P	AC830P	AC630M	T3000Z	Fig
Fine Cutting	FL	TRM 551704-FL	0.4		●	●			▲	1
		551708-FL	0.8		●	●			▲	1
Finishing	LU	TRM 551704-LU	0.4	●	●	●	●		▲	1
		551708-LU	0.8	●	●	●	●		▲	1
		551712-LU	1.2	●	●	●	●		▲	1
	SU	TRM 551704-SU	0.4	●	●	●		●	▲	1
		551708-SU	0.8	●	●	●		●	▲	1
		551712-SU	1.2	●	●	●		●	▲	1
Medium Cutting	GU	TRM 551704-GU	0.4	●	●	●	●	●		1
		551708-GU	0.8	●	●	●	●	●		1
		551712-GU	1.2	●	●	●	●	●		1

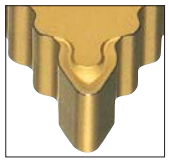
Fig 1



■ Chipbreaker Application Range

● Main Chipbreakers

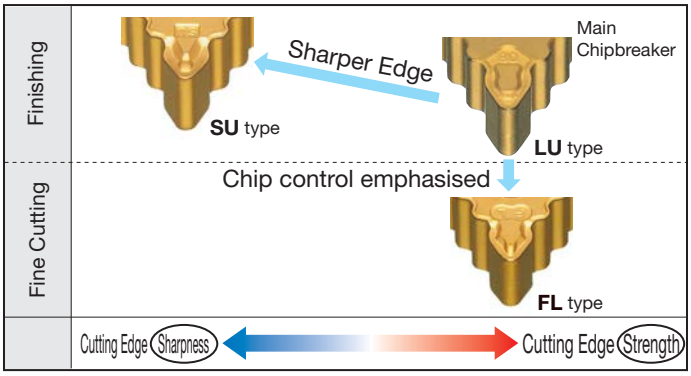




GU type

LU type

● Finishing Sub-Chipbreakers



■ Application Range by Grade (Numbers in Table are Recommended Cutting Speed vc (m/min))

Insert Grades			AC810P	AC8025P	AC820P	AC830P	AC630M	T3000Z
Grade Classification			Coating	Coating	Coating	Coating	Coating	Coated Cermet
Work Material	P	Low Carbon Steel	200 400	150 350	150 350	120 300	120 300	100 400
	P	General Steel/Alloy Steel	150 300	100 250	100 250	80 200	80 230	100 250
	M	Stainless Steel				50 150	100 160	
Applications		Finishing	◎	○	○	○	○	◎
		Medium Cutting	○	◎	◎	○	◎	○
		Interrupted Cutting		○	○	◎	○	○

◎ : Ideal, ○ : Suitable

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SDJC type

SEC-SD Profiling Tool Holder - General Turning, Facing and Profiling
Screw-on

SumiSmall

SDJC
External/Profiling/Facing

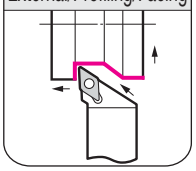


Fig 1

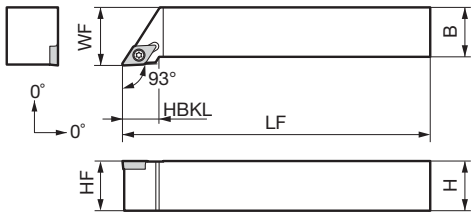


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head HBKL	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDJC R/L0808H07	SDJC R/L0808-07	●		8	8	100	10	8	15	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
SDJC R/L1010H07	SDJC R/L1010-07	●	●	10	10	100	12	10	18			1			
SDJC R/L1212H11	SDJC R/L1212-11	●	●	12	12	100	16	12	18	DC□□11T3	**B84~**	1	BFTX0409N	**3.4**	TRX15
SDJC R/L1616H11	SDJC R/L1616-11	●	●	16	16	100	20	16	18			1			
SDJC R/L2020K11	SDJC R/L2020-11	●	●	20	20	125	24	20	18			1			
SDJC R/L2525M11	SDJC R/L2525M11	●	●	25	25	150	29	25	18			1			

Applicable Inserts ◀·· SDJC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/CBN/PCD, Photo, Grade — GU / AC8025P

Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material —
General Machining	FB **T1500Z**	GU **AC8025P**	MU **AC8025P**	LB **AC6030M**	GU **AC6030M**	MU **AC6030M**	SUMIBORON BN7125/BNC500	MU **AC4015K**	No Chipbreaker **AC4015K**	FX **AC5015S**	SUMIDIA **DA1000**	AG **H1**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**	SUMIDIA **DA90**
High-precision	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	SUMIBORON BN7125/BNC500	—	—	SI **AC5015S**	SUMIDIA **DA1000**	—	SUMIBORON **BNC2115**	SUMIBORON **BN1000**	SUMIDIA BINDERLESS **NPD10**
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~	☞ A22~		☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

PRGC type / PRDC type

R

SEC-70 Holder - General Turning and Profiling
Lever Lock

PRGC
External/Profiling

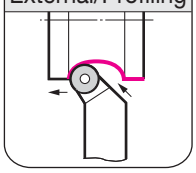


Fig 1

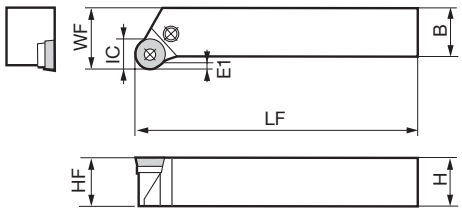


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Cutting Edge Distance E1	Inscribed Circle IC	Applicable Inserts Cat. No.	Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
PRGC R/L2020K10	●	●	20	20	125	25	20	1.5	10	RCM□1003M0	**B88**	1	LCL10	LCS10	LSR10	LSP10	LH020
PRGC R/L2525M10	●	●	25	25	150	32	25	1.5	10			1					
PRGC R/L2020K12	●	●	20	20	125	25	20	2.5	12	RCM□1204M0	**B88**	1	LCL12	LCS12	LSR12	LSP10	LH025
PRGC R/L2525M12	●	●	25	25	150	32	25	2.5	12			1					
PRGC R/L3225P12	●	●	32	25	170	32	32	2.5	12			1					
PRGC R/L2525M16			25	25	150	32	25	3.0	16	RCM□1606M0	**B88**	1	LCL16	LCS16	LSR16	LSP16	LH025
PRGC R/L3225P16			32	25	170	32	32	3.0	16			1					
PRGC R/L3232P20			32	32	170	40	32	4.0	20	RCM□2006M0	**B88**	1	LCL20	LCS20	LSR20	LSP20	LH030
PRGC R/L4040S25			40	40	250	50	40	4.5	25	RCM□2507M0	**B88**	1	LCL25	LCS25	LSR25	LSP25	LH040
PRGC R/L5050T32			50	50	300	63	50	5.5	32	RCM□3209M0	**B88**	1	LCL32	LCS32	LSR32	LSP32	LH050

R

SEC-70 Holder - General Turning and Profiling
Lever Lock

PRDC
External/Profiling

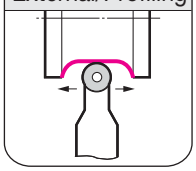
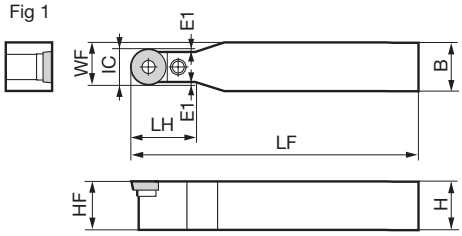


Fig 1



Holder

Parts

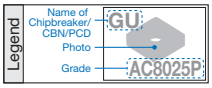
Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Cutting Edge Distance E1	Inscribed Circle IC	Applicable Inserts Cat. No.	Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
PRDC N2020M10	●	20	20	150	15.0	20	22	1.0	10	RCM□1003M0	**B88**	1	LCL10	LCS10	LSR10	LSP10	LH020
PRDC N2525M10	●	25	25	150	17.5	25	22	1.0	10			1					
PRDC N2525M12	●	25	25	150	18.5	25	24	1.2	12	RCM□1204M0	**B88**	1	LCL12	LCS12	LSR12	LSP10	LH025
PRDC N3225Q12	●	32	25	180	18.5	32	24	1.2	12			1					
PRDC N3225Q16	●	32	25	180	20.5	32	28	1.5	16	RCM□1606M0	**B88**	1	LCL16	LCS16	LSR16	LSP16	LH025
PRDC N3232Q20	●	32	32	180	26.0	32	32	1.7	20	RCM□2006M0	**B88**	1	LCL20	LCS20	LSR20	LSP20	LH030
PRDC N4040T25		40	40	300	32.5	40	42	2.0	25	RCM□2507M0	**B88**	1	LCL25	LCS25	LSR25	LSP25	LH040
PRDC N5050U32		50	50	350	41.0	50	52	2.5	32	RCM□3209M0	**B88**	1	LCL32	LCS32	LSR32	LSP32	LH050

Applicable Inserts ◂·· PRGC type / PRDC type

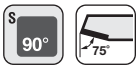
1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing
Continuous Cutting	RX AC8015P	RX AC8025P	RX AC8025P	RP AC4010K	RP AC4010K	RP AC5015S	RP AC5015S
General Machining	RX AC8025P	RH AC8025P	RH AC8035P	RP AC4015K	RP AC4015K	RP AC5015S	RP AC5015S
Interrupted Cutting	RH AC8025P	RH AC8035P	RP AC8035P	RP AC420K	RP AC420K	RP AC5025S	RP AC5025S
Recommended Cutting Conditions	☞ A10~			☞ A16~		☞ A18~	

DSBN type / DSDN type



SEC-D series Holder - General Turning and Profiling Double Clamp

DSBN
External Turning

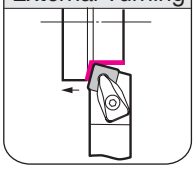


Fig 1

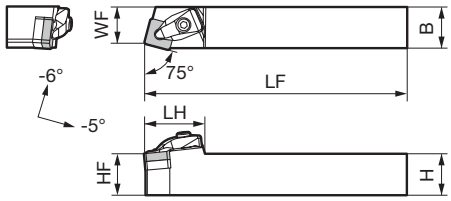


Figure shows right-handed (R) tool.

Holder

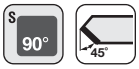
Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench
DSBN R/L2020K12	●	●	20	20	125	17	20	36	SN□□1204	B35~	1	SCP-2	5.0	SNS1204	BFTX0409N	TRX15(*)	LH040	LH025
DSBN R/L2525M12	●	●	25	25	150	22	25	36			1							
DSBN R/L2525M15	●	●	25	25	150	22	25	36	SN□□1506	B39~	1	SCP-3	5.0	SNS1506	BFTX0509N	TRX20(*)	LH040	LH025
DSBN R/L3232P15	●	●	32	32	170	27	32	36			1							
DSBN R/L3232P19	●	●	32	32	170	27	32	45	SN□□1906	B41~	1	SCP-5	5.0	SNS1906	BFTX0511N	TRX20(*)	LH040	LH025
DSBN R/L4040S19	●	●	40	40	250	35	40	45			1							
DSBN R/L4040S2507	●	●	40	40	250	35	40	58	SN□□2507	B43	1	SCP-6	6.0	SNS2507	BFTX0615N	TRD25(*)	LH060	—
DSBN R/L4040S2509	●	●	40	40	250	35	40	58	SN□□2509	B44	1	SCP-6	6.0	SNS2509	BFTX0615N	TRD25(*)	LH060	—

*Wrench for shim is sold separately from the main body.

Clamp Set Parts ☞C48



SEC-D series Holder - General Turning and Chamfering Double Clamp

DSDN
External/Chamfering

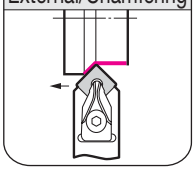
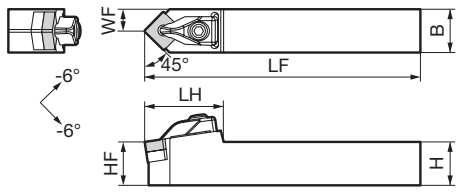


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench
DSDN N2020K12	●	20	20	125	10.0	20	36	SN□□1204	B35~	1	SCP-2	5.0	SNS1204	BFTX0409N	TRX15(*)	LH040	LH025
DSDN N2525M12	●	25	25	150	12.5	25	36			1							

*Wrench for shim is sold separately from the main body.

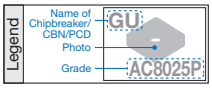
Clamp Set Parts ☞C48

Applicable Inserts

◂·· DSBN type / DSDN type / DSSN type / PSBN type / PSDN type / PSSN type / PSKN type / ESBN type / ESDN type / ESSN type / ESKN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN350	—
Recommended Cutting Conditions	☞A10~			☞A14~			☞A16~			☞A18~			☞A20~		☞M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

DSSN type / PSBN type

SEC-D series Holder - General Turning, Facing and Chamfering
Double Clamp

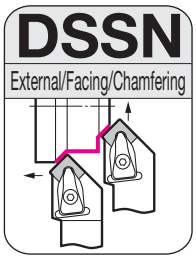


Fig 1

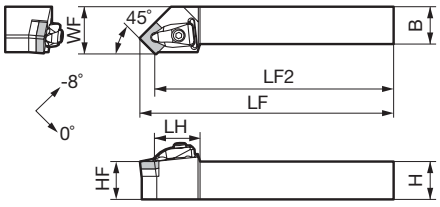


Figure shows right-handed (R) tool.

Holder

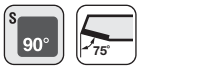
Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Overall Length 2 LF2	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench
																	TRX / TRD (For Torx holes)	(For Hexagonal hole)	(For Hexagonal hole)
DSSN R/L2020K12	●	●	20	20	133.3	125	25	20	30	SN□□1204	**B35~**	1	SCP-2	5.0	SNS1204	BFTX0409N	TRX15(*)	LH040	LH025
DSSN R/L2525M12	●	●	25	25	158.3	150	32	25	30			1							
DSSN R/L2525M15	●	●	25	25	160.2	150	32	25	30	SN□□1506	**B39~**	1	SCP-3	5.0	SNS1506	BFTX0509N	TRX20(*)	LH040	LH025
DSSN R/L3232P15	●	●	32	32	180.2	170	40	32	30			1							
DSSN R/L3232P19	●	●	32	32	182.5	170	40	32	36	SN□□1906	**B41~**	1	SCP-5	5.0	SNS1906	BFTX0511N	TRX20(*)	LH040	LH025
DSSN R/L4040S19	●	●	40	40	262.5	250	50	40	36			1							
DSSN R/L4040S2507	●	●	40	40	266.0	250	50	40	47	SN□□2507	**B43**	1	SCP-6	6.0	SNS2507	BFTX0615N	TRD25(*)	LH060	—
DSSN R/L4040S2509	●	●	40	40	266.0	250	50	40	47	SN□□2509	**B44**	1	SCP-6	6.0	SNS2509	BFTX0615N	TRD25(*)	LH060	—

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48



SEC-70 Holder - General Turning and Profiling
Lever Lock

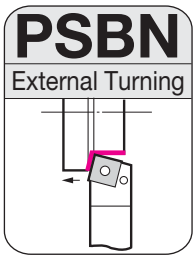


Fig 1

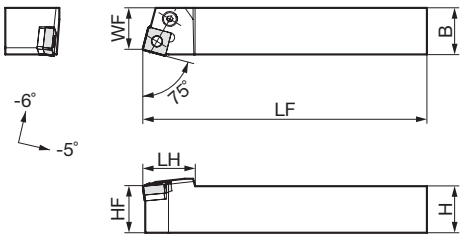


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
																	(For Hexagonal hole)
PSBN R/L1616H09	PSBN R/L1616-32	●	●	16	16	100	13	16	22	SN□□0903	**B34**	1	LCL3	LCS3	LSS32	LSP3	LH025
PSBN R/L2020K12	PSBN R/L2020-43	●	●	20	20	125	17	20	28	SN□□1204	**B35~**	1	LCL4	LCS4	LSS42	LSP4	LH030
PSBN R/L2520M12	PSBN R/L2520-43			25	20	150	17	25	28			1					
PSBN R/L2525M12	PSBN R/L2525-43	●	●	25	25	150	22	25	28			1					
PSBN R/L3225P12	PSBN R/L3225-43			32	25	170	22	32	28			1					
PSBN R/L3232P12	PSBN R/L3232-43			32	32	170	27	32	35			1					
PSBN R/L3225P15	PSBN R/L3225-54			32	25	170	22	32	35	SN□□1506	**B39~**	1	LCL5	LCS5	LSS53	LSP5	LH030
PSBN R/L3232P15	PSBN R/L3232-54	●	●	32	32	170	27	32	35			1					
PSBN R/L3232P19	PSBN R/L3232-64	●	●	32	32	170	27	32	40	SN□□1906	**B41~**	1	LCL6	LCS6	LSS63	LSP6	LH040
PSBN R/L4040R19	PSBN R/L4040-64			40	40	200	35	40	40			1					
PSBN R/L5050S25	PSBN R/L5050-85			50	50	250	43	50	50	SN□□2507	**B43**	1	LCL8	LCS8	LSS84	LSP8	LH050

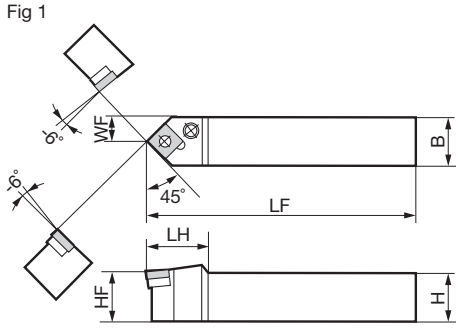
N·m Recommended Tightening Torque (N·m)

PSDN type

SEC-70 Holder - General Turning and Chamfering
Lever Lock

PSDN
External/Chamfering

Fig 1



Holder

Parts

Dimensions (mm)

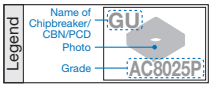
Cat. No.	Previous Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
PSDN N1616H09	PSDN N1616-32	●	16	16	100	8.0	16	22	SN□□0903	**B34**	1	LCL3	LCS3	LSS32	LSP3	LH025
PSDN N2020K12	PSDN N2020-43	●	20	20	125	10.0	20	30	SN□□1204	**B35~**	1	LCL4	LCS4	LSS42	LSP4	LH030
PSDN N2520M12	PSDN N2520-43		25	20	150	10.0	25	30			1					
PSDN N2525M12	PSDN N2525-43	●	25	25	150	12.5	25	30			1					
PSDN N3225P12	PSDN N3225-43		32	25	170	12.5	32	30			1					
PSDN N3232P12	PSDN N3232-43	●	32	32	170	16.0	32	40			1					
PSDN N3225P15	PSDN N3225-54		32	25	170	12.5	32	40	SN□□1506	**B39~**	1	LCL5	LCS5	LSS53	LSP5	LH030
PSDN N3232P15	PSDN N3232-54		32	32	170	16.0	32	40			1					
PSDN N3232P19	PSDN N3232-64	●	32	32	170	16.0	32	40	SN□□1906	**B41~**	1	LCL6	LCS6	LSS63	LSP6	LH040
PSDN N4040R19	PSDN N4040-64		40	40	200	20.0	40	40			1					

Applicable Inserts

◀·· DSBN type / DSDN type / DSSN type / PSBN type / PSDN type / PSSN type / PSKN type / ESBN type / ESDN type / ESSN type / ESKN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN350	—
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

PSSN type / PSKN type

SEC-70 Holder - General Turning, Facing and Chamfering
Lever Lock

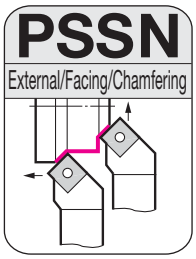


Fig 1

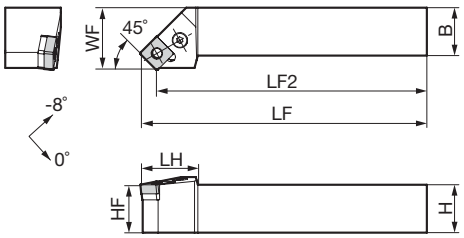


Figure shows right-handed (R) tool.

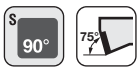
Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Overall Length 2 LF2	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
PSSN R/L1616H09	PSSN R/L1616-32	●	●	16	16	100	93.8	20	16	22	SN□□0903	**B34**	1	LCL3	LCS3	LSS32	LSP3	LH025
PSSN R/L2020K12	PSSN R/L2020-43	●	●	20	20	125	116.7	25	20	30			1					
PSSN R/L2520M12	PSSN R/L2520-43			25	20	150	141.7	25	25	30			1					
PSSN R/L2525M12	PSSN R/L2525-43	●	●	25	25	150	141.7	32	25	30	SN□□1204	**B35~**	1	LCL4	LCS4	LSS42	LSP4	LH030
PSSN R/L3225P12	PSSN R/L3225-43			32	25	170	161.7	32	32	30			1					
PSSN R/L3232P12	PSSN R/L3232-43			32	32	170	161.7	40	32	30			1					
PSSN R/L3225P15	PSSN R/L3225-54			32	25	170	159.8	32	32	40	SN□□1506	**B39~**	1	LCL5	LCS5	LSS53	LSP5	LH030
PSSN R/L3232P15	PSSN R/L3232-54	●	●	32	32	170	159.8	40	32	40			1					
PSSN R/L3232P19	PSSN R/L3232-64	●	●	32	32	170	157.5	40	32	40	SN□□1906	**B41~**	1	LCL6	LCS6	LSS63	LSP6	LH040
PSSN R/L4040R19	PSSN R/L4040-64			40	40	200	187.5	50	40	40			1					

When using handed breaker inserts for facing, the holder and insert are opposite handed.



SEC-70 series Holder - Facing
Lever Lock

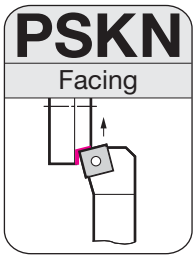


Fig 1

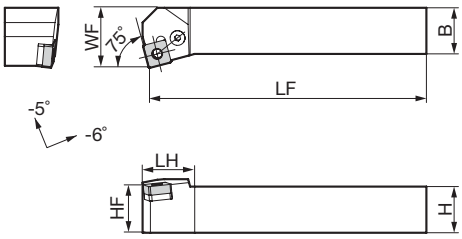


Figure shows right-handed (R) tool.

Holder

Parts

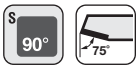
Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
PSKN R/L1616H09	PSKN R/L1616-32	●	●	16	16	100	20	16	20	SN□□0903	**B34**	1	LCL3	LCS3	LSS32	LSP3	LH025
PSKN R/L2020K12	PSKN R/L2020-43	●	●	20	20	125	25	20	26			1					
PSKN R/L2520M12	PSKN R/L2520-43			25	20	150	25	25	26			1					
PSKN R/L2525M12	PSKN R/L2525-43	●	●	25	25	150	32	25	26	SN□□1204	**B35~**	1	LCL4	LCS4	LSS42	LSP4	LH030
PSKN R/L3225P12	PSKN R/L3225-43			32	25	170	32	32	26			1					
PSKN R/L3232P12	PSKN R/L3232-43			32	32	170	32	32	26			1					
PSKN R/L3225P15	PSKN R/L3225-54			32	25	170	32	32	32	SN□□1506	**B39~**	1	LCL5	LCS5	LSS53	LSP5	LH030
PSKN R/L3232P15	PSKN R/L3232-54			32	32	170	40	32	32			1					
PSKN R/L3232P19	PSKN R/L3232-64	●	●	32	32	170	40	32	36	SN□□1906	**B41~**	1	LCL6	LCS6	LSS63	LSP6	LH040
PSKN R/L4040R19	PSKN R/L4040-64			40	40	200	50	40	36			1					
PSKN R/L5050S25	PSKN R/L5050-85			50	50	250	60	50	50	SN□□2507	**B43**	1	LCL8	LCS8	LSS84	LSP8	LH050

When using handed breaker inserts for facing, the holder and insert are opposite handed.

Note: The values in red (cutting edge WF) have been changed from those in the 2021-2022 General Catalogue.

ESBN type / ESDN type



SEC-30 Holder - General Turning
Pin Lock

ESBN
External Turning

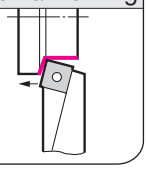


Fig 1

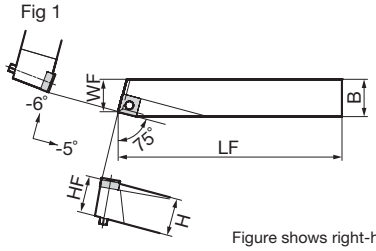


Fig 2

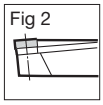


Fig 3

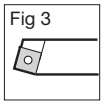


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ESBN R/L1212F09	ESBN R/L1212	●	●	12	12	80	9.5	11.5	SN□□0903	**B34**	1	P321US	—	KY40
ESBN R/L1616H09	ESBN R/L1616H32			16	16	100	13.0	15.5			1	P322US	—	
ESBN R/L1616H12	ESBN R/L1616H43			16	16	100	13.0	15.5	SN□□1204	**B35~**	3	P432U	—	KY40
ESBN R/L2020K12	ESBN R/L2020			20	20	125	17.0	19.5			1	P433U	—	
ESBN R/L2020K12W	ESBN R/L2020W	●	●	20	20	125	17.0	19.5			2	P433W	ESS42	
ESBN R/L2520M12	ESBN R/L2520			25	20	150	17.0	24.5			3	P434U	—	
ESBN R/L2520M12W	ESBN R/L2520W			25	20	150	17.0	24.5			2	P434W	ESS42	
ESBN R/L2525M12	ESBN R/L2525			25	25	150	22.0	24.5			1	P434U	—	
ESBN R/L2525M12W	ESBN R/L2525W	●		25	25	150	22.0	24.5			2	P434W	ESS42	

SEC-30 Holder - General Turning and Chamfering
Pin Lock

ESDN
External/Chamfering

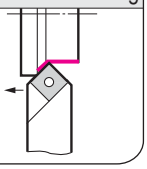


Fig 1

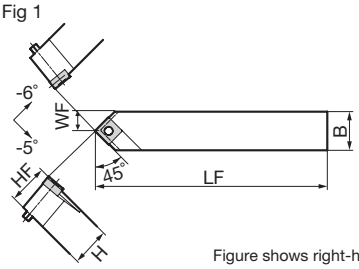


Fig 2

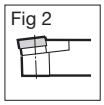


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

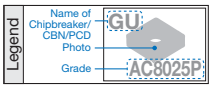
Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ESDN R/L1212F09	ESDN R/L1212	●	●	12	12	80	6.0	11.5	SN□□0903	**B34**	1	P321US	—	KY40
ESDN R/L1616H09	ESDN R/L1616H32	●	●	16	16	100	8.0	15.5			1	P322US	—	
ESDN R/L2020K12	ESDN R/L2020			20	20	125	10.0	19.5	SN□□1204	**B35~**	1	P433U	—	KY40
ESDN R/L2020K12W	ESDN R/L2020W	●	●	20	20	125	10.0	19.5			2	P433W	ESS42	
ESDN R/L2520M12	ESDN R/L2520			25	20	150	10.0	24.5			1	P434U	—	
ESDN R/L2520M12W	ESDN R/L2520W			25	20	150	10.0	24.5			2	P434W	ESS42	
ESDN R/L2525M12	ESDN R/L2525			25	25	150	12.5	24.5			1	P434U	—	
ESDN R/L2525M12W	ESDN R/L2525W	●	●	25	25	150	12.5	24.5			2	P434W	ESS42	

Applicable Inserts

◀·· DSBN type / DSDN type / DSSN type / PSBN type / PSDN type / PSSN type / PSKN type / ESBN type / ESDN type / ESSN type / ESKN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE **T1500Z**	GU **AC8015P**	MU **AC8025P**	EF **AC6020M**	EG **AC6020M**	EM **AC6030M**	SUMIBORON BN7125/BNC500	UZ **AC4010K**	GZ **AC4010K**	EF **AC5015S**	EG **AC5015S**	EM **AC5015S**	SUMIBORON **BNC2115**	SUMIBORON **BN1000**	SUMIDIA BINDERLESS **NPD10**
General Machining	SU **AC8015P**	GU **AC8025P**	MU **AC8025P**	EF **AC6030M**	EG **AC6030M**	EM **AC6040M**	SUMIBORON BN7125/BNC500	GZ **AC4015K**	GZ **AC4015K**	EF **AC5015S**	EG **AC5015S**	EM **AC5025S**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**	SUMIDIA **DA90**
Interrupted Cutting	SX **AC8025P**	UX **AC8035P**	MX **AC8035P**	EF **AC6030M**	EG **AC6040M**	EM **AC6040M**	SUMIBORON BN7125/BNC500	GZ **AC420K**	No Chipbreaker **AC420K**	EF **AC5025S**	EG **AC5025S**	EM **AC5025S**	SUMIBORON **BNC2125**	SUMIBORON **BN350**	—
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

ESSN type / ESKN type

SEC-30 Holder - General Turning, Facing and Chamfering
Pin Lock

ESSN
External/Facing/Chamfering

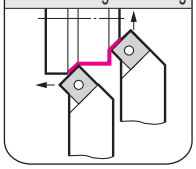


Fig 1

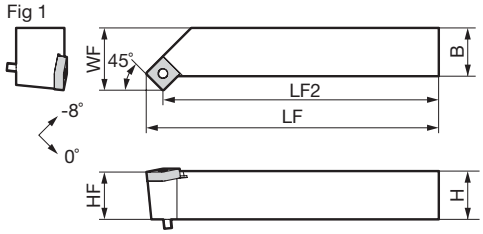


Fig 2

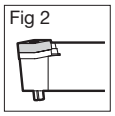


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Overall Length 2 LF2	Cutting Edge WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ESSN R/L1212F09	ESSN R/L1212	●	●	12	12	80	73.8	16	11.5	SN□□0903	**B34**	1	P321US	—	KY40
ESSN R/L1616H09	ESSN R/L1616H32	●	●	16	16	100	93.8	20	15.5			1	P322US	—	
ESSN R/L1616H12	ESSN R/L1616H43			16	16	100	91.7	20	15.5	SN□□1204	**B35~**	1	P432U	—	KY40
ESSN R/L2020K12	ESSN R/L2020	●	●	20	20	125	116.7	25	19.5			1	P433U	—	
ESSN R/L2020K12W	ESSN R/L2020W	●	●	20	20	125	116.7	25	19.5			2	P433W	ESS42	
ESSN R/L2520M12	ESSN R/L2520			25	20	150	141.7	25	24.5			1	P434U	—	
ESSN R/L2520M12W	ESSN R/L2520W			25	20	150	141.7	25	24.5			2	P434W	ESS42	
ESSN R/L2525M12	ESSN R/L2525			25	25	150	141.7	32	24.5			1	P434U	—	
ESSN R/L2525M12W	ESSN R/L2525W	●	●	25	25	150	141.7	32	24.5			2	P434W	ESS42	

When using handed breaker inserts for facing, the holder and insert are opposite handed.

SEC-30 series Holder - Facing
Pin Lock

ESKN
Facing

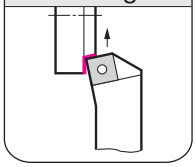


Fig 1

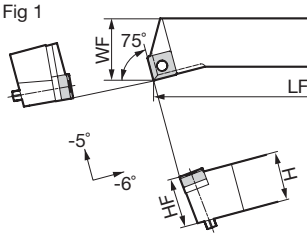


Fig 2

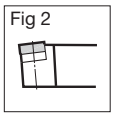


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ESKN R/L1212F09	ESKN R/L1212	●	●	12	12	80	16	11.5	SN□□0903	**B34**	1	P321US	—	KY40
ESKN R/L1616H09	ESKN R/L1616H32	●	●	16	16	100	20	15.5			1	P322US	—	
ESKN R/L1616H12	ESKN R/L1616H43			16	16	100	20	15.5	SN□□1204	**B35~**	1	P432U	—	KY40
ESKN R/L2020K12	ESKN R/L2020			20	20	125	25	19.5			1	P433U	—	
ESKN R/L2020K12W	ESKN R/L2020W	●	●	20	20	125	25	19.5			2	P433W	ESS42	
ESKN R/L2520M12	ESKN R/L2520			25	20	150	25	24.5			1	P434U	—	
ESKN R/L2520M12W	ESKN R/L2520W			25	20	150	25	24.5			2	P434W	ESS42	
ESKN R/L2525M12	ESKN R/L2525			25	25	150	32	24.5			1	P434U	—	
ESKN R/L2525M12W	ESKN R/L2525W	●	●	25	25	150	32	24.5			2	P434W	ESS42	

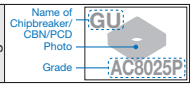
When using handed breaker inserts for facing, the holder and insert are opposite handed.

Applicable Inserts

◀·· DSBN type / DSDN type / DSSN type / PSBN type / PSDN type / PSSN type / PSKN type / ESBN type / ESDN type / ESSN type / ESKN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN350	—
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

CSRP type / CSDP type

SEC-40 Holder - General Turning
Clamp-on

CSRP
External Turning

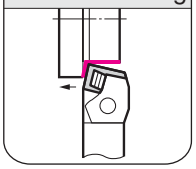


Fig 1

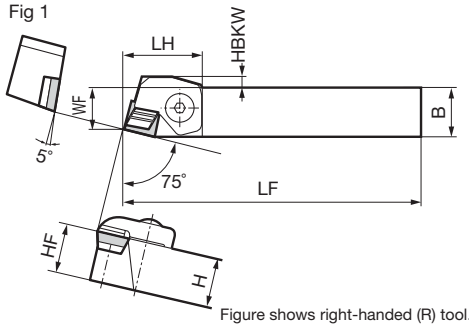


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Step HBKW	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Plate	Chipbreaker	Bolt	Shim	Shim Retainer	Spring	Wrench
CSRP R/L1919-L12	FP11 R/L-33	●		19	19	140	15.5	19	34.5	5.0			1			BH0824R/L				
CSRP R/L2525-N12	FP11 R/L-44A	●		25	25	160	21.5	25	34.5	—	SP□□1203	**B97**	1	DCR/L1	CBD4R/L	BH0830R/L	SSPD422	SPP3	DSP5	LH040
CSRP R/L3225-N12	FP11 R/L-45A			32	25	160	21.5	32	34.5	—			1			BH0830R/L				
CSRP R/L2525-N15	FP11 R/L-44B	●		25	25	160	21.5	25	40.0	4.5	SP□□1504	**B98**	1	DCR/L3	CBD5R/L	BH1030R/L	SSPD522	SPP3	DSP5	LH050
CSRP R/L3232-N15	FP11 R/L-55			32	32	180	26.0	32	40.0	—			1			BH1036R/L				

SEC-40 Holder - General Turning and Chamfering
Clamp-on

CSDP
External/Chamfering

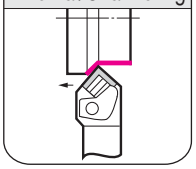


Fig 1

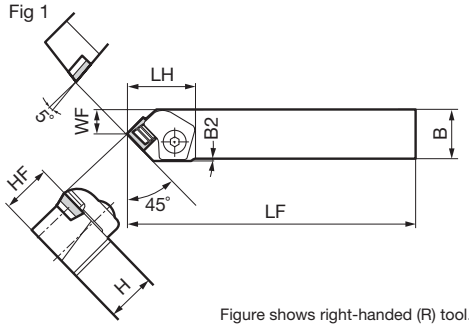


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Step B2	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Plate	Chipbreaker	Bolt	Shim	Shim Retainer	Spring	Wrench
CSDP R/L1919-L12	FP14 R/L-33	●		19	19	140	10.5	19	35	6			1			BH0824R/L				
CSDP R/L2525-N12	FP14 R/L-44A	●		25	25	160	12.5	25	35	2	SP□□1203	**B97**	1	DCR/L1	CBD4R/L	BH0830R/L	SSPD422	SPP3	DSP5	LH040
CSDP R/L3225-N12	FP14 R/L-45A			32	25	160	12.5	32	35	2			1			BH0830R/L				

Applicable Inserts ◀··· CSRP type / CSDP type / CSKP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD, Photo, Grade — GU, AC8025P

Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	N (Non-Ferrous)	H (Hardened Steel)
General Machining	FK T1500Z	SF AC8025P	SUMIBORON BN7125	No Chipbreaker AC4015K	No Chipbreaker AC4015K	No Chipbreaker AC5015S	No Chipbreaker AC5025S	SUMIDIA DA1000	SUMIBORON BN2000
Recommended Cutting Conditions	☞ A10~		☞ A16~			☞ A18~		☞ A22~	☞ A20~

CSKP type

SEC-40 series Holder - Facing
Clamp-on

CSKP
Facing

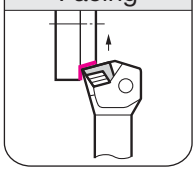


Fig 1

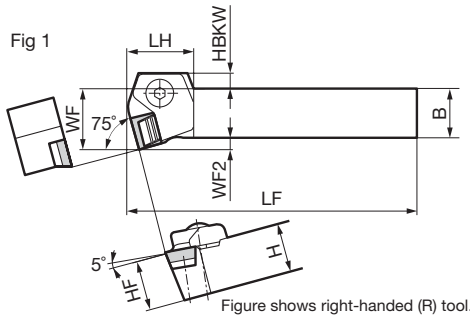


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	H	B	LF	WF	HF	LH	WF2	HBKW	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Plate	Chipbreaker	Bolt	Shim	Shim Retainer	Spring	Wrench
CSKP R/L1919-L12	FP15 R/L-33			19	19	140	25	19	22	6	7	SP□□1203	**B97**	1	DCL/R1	CBD4L/R	BH0824L/R	SSPD422	SPP3	DSP5	LH040
CSKP R/L2525-N12	FP15 R/L-44A		●	25	25	160	32	25	22	7	—			1			BH0830L/R				
CSKP R/L3225-N12	FP15 R/L-45A			32	25	160	32	32	22	7	—			1			BH0830L/R				
CSKP R/L2525-N15	FP15 R/L-44B	●		25	25	160	31	25	28	6	7	SP□□1504	**B98**	1	DCL/R3	CBD5L/R	BH1030L/R	SSPD522	SPP3	DSP5	LH050
CSKP R/L3232-Q15	FP15 R/L-55			32	32	180	38	32	28	6	—			1			BH1036L/R				

When using handed breaker inserts for facing, the holder and insert are opposite handed.

Applicable Inserts ◂·· CSRP type / CSDP type / CSKP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD, Photo, Grade — GU, AC8025P

Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	N (Non-Ferrous) —	H (Hardened Steel) Uncoated
General Machining	FK **T1500Z**	SF **AC8025P**	SUMIBORON **BN7125**	No Chipbreaker **AC4015K**	No Chipbreaker **AC4015K**	No Chipbreaker **AC5015S**	No Chipbreaker **AC5025S**	**SUMIDIA DA1000**	**SUMIBORON BN2000**
Recommended Cutting Conditions	☞ A10~		☞ A16~			☞ A18~		☞ A22~	☞ A20~

DTGN type / DTFN type

SEC-D Holder - General Turning and Profiling
Double Clamp

DTGN
External Turning

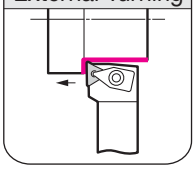


Fig 1

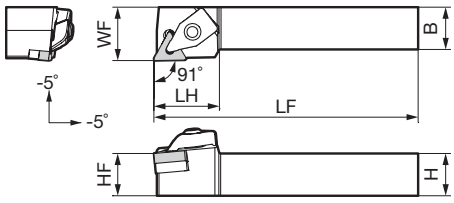


Fig 2

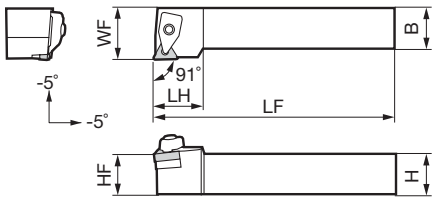


Figure shows right-handed (R) tool.

Holder

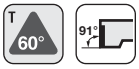
Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim (For Torx hole)	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
DTGN R/L2020K16	●	●	20	20	125	25	20	31	TN□□1604	**B50~**	1	SCP-1	**5.0**	TNS1604	BFTX0307N	TRX10(*)	LH040	LH025
DTGN R/L2525M16	●	●	25	25	150	32	25	31			2							

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48



SEC-D series Holder - Facing
Double Clamp

DTFN
Facing

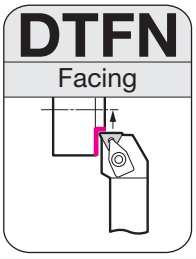


Fig 1

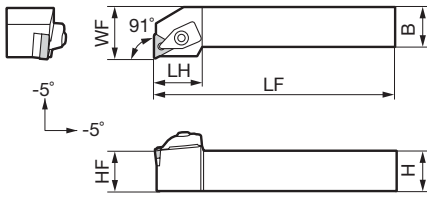


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim (For Torx hole)	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
DTFN R/L2020K16	●	●	20	20	125	25	20	30	TN□□1604	**B50~**	1	SCP-1	**5.0**	TNS1604	BFTX0307N	TRX10(*)	LH040	LH025
DTFN R/L2525M16	●	●	25	25	150	32	25	30			1							

*Wrench for shim is sold separately from the main body.
When using handed breaker inserts for facing, the holder and insert are opposite handed.

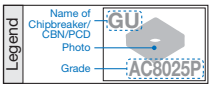
Clamp Set Parts C48

Applicable Inserts

◀·· DTGN type / DTFN type / PTGN type / PTTN type / PTFN type / ETGN type / ETAN type / ETFN type / ETEN type / ETXN type / MTJN type / MTXN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) —	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	SUMIBORON BNC2115	SUMIBORON BN1000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	GZ AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	SUMIBORON BNC300	SUMIBORON BN350
Recommended Cutting Conditions	A10~			A14~			A16~			A18~			A22~	A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

PTGN type / PTTN type

SEC-70 Holder - General Turning and Profiling
Lever Lock

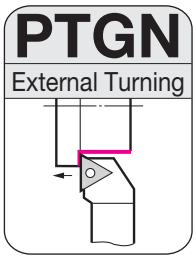


Fig 1

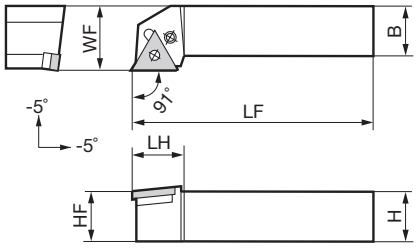


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
PTGN R/L1616H16	PTGN R/L1616-33	●	●	16	16	100	20	16	20			1					
PTGN R/L2020K16	PTGN R/L2020-33	●	●	20	20	125	25	20	20			1					
PTGN R/L2520M16	PTGN R/L2520-33			25	20	150	25	25	20	TN□□1604	**B50~**	1	LCL3	LCS3	LST317	LSP3	LH025
PTGN R/L2525M16	PTGN R/L2525-33	●	●	25	25	150	32	25	20			1					
PTGN R/L3225P16	PTGN R/L3225-33			32	25	170	32	32	20			1					
PTGN R/L2525M22	PTGN R/L2525-43	●	●	25	25	150	32	25	28			1					
PTGN R/L3225P22	PTGN R/L3225-43			32	25	170	32	32	28	TN□□2204	**B55~**	1	LCL4	LCS4	LST42	LSP4	LH030
PTGN R/L3232P22	PTGN R/L3232-43			32	32	170	40	32	28			1					
PTGN R/L3232P27	PTGN R/L3232-54			32	32	170	40	32	33	TN□□2706	**B57**	1	LCL5	LCS5	LST53	LSP5	LH030
PTGN R/L4040R27	PTGN R/L4040-54			40	40	200	50	40	33			1					

SEC-70 Holder - General Turning and Profiling
Lever Lock

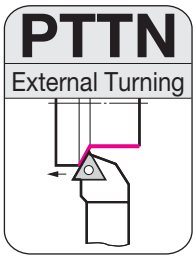


Fig 1

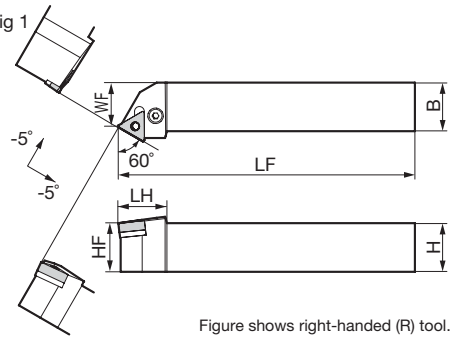


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
PTTN R/L1616H16	PTTN R/L1616-33	●	●	16	16	100	13	16	25			1					
PTTN R/L2020K16	PTTN R/L2020-33	●	●	20	20	125	17	20	25			1					
PTTN R/L2520M16	PTTN R/L2520-33			25	20	150	17	25	25	TN□□1604	**B50~**	1	LCL3	LCS3	LST317	LSP3	LH025
PTTN R/L2525M16	PTTN R/L2525-33	●	●	25	25	150	22	25	25			1					
PTTN R/L3225P16	PTTN R/L3225-33			32	25	170	22	32	25			1					
PTTN R/L2525M22	PTTN R/L2525-43			25	25	150	22	25	25	TN□□2204	**B55~**	1	LCL4	LCS4	LST42	LSP4	LH030
PTTN R/L3225P22	PTTN R/L3225-43			32	25	170	22	32	25			1					

PTFN type

SEC-70 series Holder - Facing
Lever Lock

PTFN
Facing

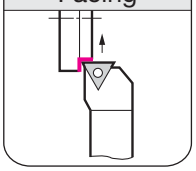


Fig 1

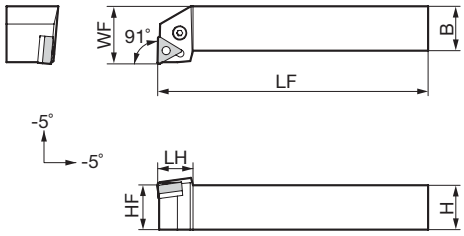


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
PTFN R/L1616H16	PTFN R/L1616-33	●	●	16	16	100	20	16	20	TN□□1604	**B50~**	1	LCL3	LCS3	LST317	LSP3	LH025
PTFN R/L2020K16	PTFN R/L2020-33	●	●	20	20	125	25	20	20			1					
PTFN R/L2520M16	PTFN R/L2520-33			25	20	150	25	25	20			1					
PTFN R/L2525M16	PTFN R/L2525-33	●	●	25	25	150	32	25	20			1					
PTFN R/L3225P16	PTFN R/L3225-33			32	25	170	32	32	20			1					
PTFN R/L2525M22	PTFN R/L2525-43	●	●	25	25	150	32	25	25	TN□□2204	**B56~**	1	LCL4	LCS4	LST42	LSP4	LH030
PTFN R/L3225P22	PTFN R/L3225-43			32	25	170	32	32	25			1					
PTFN R/L3232P22	PTFN R/L3232-43	●	●	32	32	170	40	32	25			1					
PTFN R/L3232P27	PTFN R/L3232-54			32	32	170	40	32	34	TN□□2706	**B57**	1	LCL5	LCS5	LST53	LSP5	LH030
PTFN R/L4040R27	PTFN R/L4040-54			40	40	200	50	40	34			1					

When using handed breaker inserts for facing, the holder and insert are opposite handed.

Applicable Inserts

◀·· DTGN type / DTFN type / PTGN type / PTTN type / PTFN type / ETGN type / ETAN type / ETFN type / ETEN type / ETXN type / MTJN type / MTXN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo / Grade — GU / AC8025P

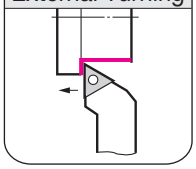
Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) —	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE **T1500Z**	GU **AC8015P**	MU **AC8025P**	EF **AC6020M**	EG **AC6020M**	EM **AC6030M**	SUMIBORON BN7125/BNC500	UZ **AC4010K**	GZ **AC4010K**	EF **AC5015S**	EG **AC5015S**	EM **AC5015S**	SUMIDIA **DA1000**	SUMIBORON **BNC2115**	SUMIBORON **BN1000**
General Machining	SU **AC8015P**	GU **AC8025P**	MU **AC8025P**	EF **AC6030M**	EG **AC6030M**	EM **AC6040M**	SUMIBORON BN7125/BNC500	GZ **AC4015K**	GZ **AC4015K**	EF **AC5015S**	EG **AC5015S**	EM **AC5025S**	SUMIDIA **DA1000**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**
Interrupted Cutting	SX **AC8025P**	UX **AC8035P**	MX **AC8035P**	EF **AC6030M**	EG **AC6040M**	EM **AC6040M**	SUMIBORON BN7125/BNC500	GZ **AC420K**	GZ **AC420K**	EF **AC5025S**	EG **AC5025S**	EM **AC5025S**	SUMIDIA **DA1000**	SUMIBORON **BNC300**	SUMIBORON **BN350**
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~	☞ A20~	

BNC500 is for ductile cast iron.

ETGN type / ETAN type

SEC-30 Holder - General Turning
Pin Lock

ETGN
External Turning



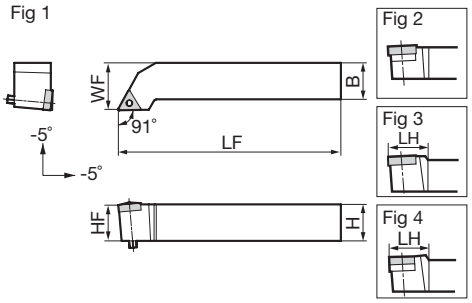


Figure shows right-handed (R) tool.

Holder

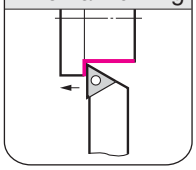
Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ETGN R/L1212F11	ETGN R/L1212	●	●	12	12	80	16	11.5	—	TN□□1103	**B48**	1	P221US	—	KY25
ETGN R/L1616H1603	ETGN R/L1616H32	●	●	16	16	100	20	15.5	—	TN□□1603	**B49~**	1	P322US	—	KY40
ETGN R/L1616H1604	ETGN R/L1616H33	●	●	16	16	100	20	15.5	—	TN□□1604	**B50~**	1	P332US	—	KY40
ETGN R/L2020K1603	ETGN R/L2020K32			20	20	125	25	19.5	—	TN□□1603	**B49~**	1	P323US	—	KY40
ETGN R/L2020K1603W	ETGN R/L2020K32W			20	20	125	25	19.5	—			2	P323WS	EST32	
ETGN R/L2020K1604	ETGN R/L2020K33	●	●	20	20	125	25	19.5	—	TN□□1604	**B50~**	1	P333US	—	KY40
ETGN R/L2020K1604W	ETGN R/L2020K33W	●	●	20	20	125	25	19.5	—			2	P333WS	EST32	
ETGN R/L2520M1604	ETGN R/L2520			25	20	150	25	24.5	—			1	P334US	—	
ETGN R/L2520M1604W	ETGN R/L2520W			25	20	150	25	24.5	—			2	P334WS	EST32	
ETGN R/L2525M1604	ETGN R/L2525M33			25	25	150	32	24.5	—			1	P334US	—	
ETGN R/L2525M1604W	ETGN R/L2525M33W	●	●	25	25	150	32	24.5	—			2	P334WS	EST32	
ETGN R/L2525M22	ETGN R/L2525M43			25	25	150	32	24.5	30	TN□□2204	**B55~**	3	P434U	—	KY40
ETGN R/L2525M22W	ETGN R/L2525M43W	●	●	25	25	150	32	24.5	30			4	P434W	EST43	

SEC-30 Holder - General Turning
Pin Lock

ETAN
External Turning



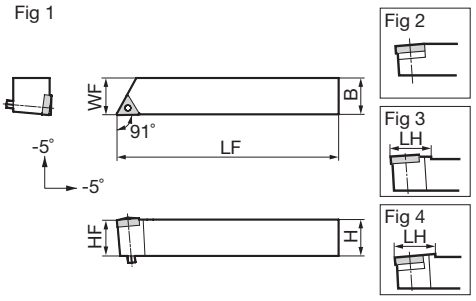


Figure shows right-handed (R) tool.

Holder

Parts

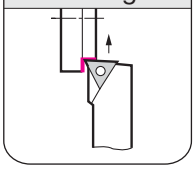
Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ETAN R/L1212F11	ETAN R/L1212	●	●	12	12	80	12	11.5	—	TN□□1103	**B48**	1	P221US	—	KY25
ETAN R/L1616H1603	ETAN R/L1616H32			16	16	100	16	15.5	—	TN□□1603	**B49~**	1	P322US	—	KY40
ETAN R/L1616H1604	ETAN R/L1616H33	●	●	16	16	100	16	15.5	—	TN□□1604	**B50~**	1	P332US	—	KY40
ETAN R/L2020K1603	ETAN R/L2020K32			20	20	125	20	19.5	—	TN□□1603	**B49~**	1	P323US	—	KY40
ETAN R/L2020K1603W	ETAN R/L2020K32W			20	20	125	20	19.5	—			2	P323WS	EST32	
ETAN R/L2020K1604	ETAN R/L2020K33			20	20	125	20	19.5	—	TN□□1604	**B50~**	1	P333US	—	KY40
ETAN R/L2020K1604W	ETAN R/L2020K33W	●	●	20	20	125	20	19.5	—			2	P333WS	EST32	
ETAN R/L2520M1604	ETAN R/L2520			25	20	150	20	24.5	—			1	P334US	—	
ETAN R/L2520M1604W	ETAN R/L2520W			25	20	150	20	24.5	—			2	P334WS	EST32	
ETAN R/L2525M1604	ETAN R/L2525M33			25	25	150	25	24.5	—			1	P334US	—	
ETAN R/L2525M1604W	ETAN R/L2525M33W	●	●	25	25	150	25	24.5	—			2	P334WS	EST32	
ETAN R/L2525M22	ETAN R/L2525M43			25	25	150	25	24.5	30	TN□□2204	**B55~**	3	P434U	—	KY40
ETAN R/L2525M22W	ETAN R/L2525M43W	●	●	25	25	150	25	24.5	30			4	P434W	EST43	

ETFN type

SEC-30 series Holder - Facing
Pin Lock

ETFN
Facing



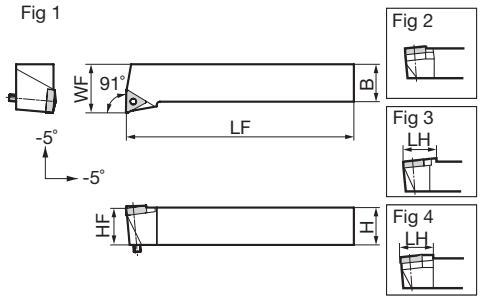


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ETFN R/L1212F11	ETFN R/L1212	●	●	12	12	80	16	11.5	—	TN□□1103	**B48**	1	P221US	—	KY25
ETFN R/L1616H1603	ETFN R/L1616H32			16	16	100	20	15.5	—	TN□□1603	**B49~**	1	P322US	—	KY40
ETFN R/L1616H1604	ETFN R/L1616H33	●	●	16	16	100	20	15.5	—	TN□□1604	**B50~**	1	P332US	—	KY40
ETFN R/L2020K1603	ETFN R/L2020K32			20	20	125	25	19.5	—	TN□□1603	**B49~**	1	P323US	—	KY40
ETFN R/L2020K1603W	ETFN R/L2020K32W			20	20	125	25	19.5	—			2	P323WS	EST32	
ETFN R/L2020K1604	ETFN R/L2020K33			20	20	125	25	19.5	—	TN□□1604	**B50~**	1	P333US	—	KY40
ETFN R/L2020K1604W	ETFN R/L2020K33W	●	●	20	20	125	25	19.5	—			2	P333WS	EST32	
ETFN R/L2520M1604	ETFN R/L2520			25	20	150	25	24.5	—			1	P334US	—	
ETFN R/L2520M1604W	ETFN R/L2520W			25	20	150	25	24.5	—			2	P334WS	EST32	
ETFN R/L2525M1604	ETFN R/L2525M33			25	25	150	32	24.5	—			1	P334US	—	
ETFN R/L2525M1604W	ETFN R/L2525M33W	●	●	25	25	150	32	24.5	—			2	P334WS	EST32	
ETFN R/L2525M22	ETFN R/L2525M43			25	25	150	32	24.5	30	TN□□2204	**B55~**	3	P434U	—	KY40
ETFN R/L2525M22W	ETFN R/L2525M43W	●	●	25	25	150	32	24.5	30			4	P434W	EST43	

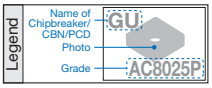
When using handed breaker inserts for facing, the holder and insert are opposite handed.

Applicable Inserts

◀·· DTGN type / DTFN type / PTGN type / PTTN type / PTFN type / ETGN type / ETAN type / ETFN type / ETEN type / ETXN type / MTJN type / MTXN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) —	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	SUMIBORON BNC2115	SUMIBORON BN1000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	GZ AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	SUMIBORON BNC300	SUMIBORON BN350
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~	☞ A20~	

BNC500 is for ductile cast iron.

ETEN type / ETXN type

SEC-30 Holder - General Turning and Profiling
Pin Lock

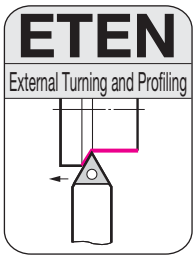


Fig 1

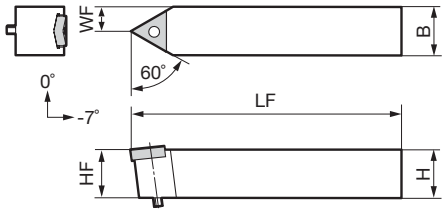


Fig 2

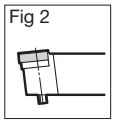


Fig 3

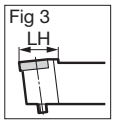
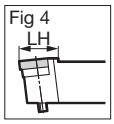


Fig 4

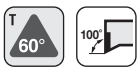


Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ETEN N1212F11	ETEN N1212	●	12	12	80	6.0	11.5	—	TN□□1103	**B48**	1	P221US	—	KY25
ETEN N1616H1603	ETEN N1616H32		16	16	100	8.0	15.5	—	TN□□1603	**B49~**	1	P322US	—	KY40
ETEN N1616H1604	ETEN N1616H33	●	16	16	100	8.0	15.5	—	TN□□1604	**B50~**	1	P332US	—	KY40
ETEN N2020K1603	ETEN N2020K32		20	20	125	10.0	19.5	—	TN□□1603	**B49~**	1	P323US	—	KY40
ETEN N2020K1603W	ETEN N2020K32W		20	20	125	10.0	19.5	—			2	P323WS	EST32	
ETEN N2020K1604	ETEN N2020K33	●	20	20	125	10.0	19.5	—	TN□□1604	**B50~**	1	P333US	—	KY40
ETEN N2020K1604W	ETEN N2020K33W	●	20	20	125	10.0	19.5	—			2	P333WS	EST32	
ETEN N2520M1604	ETEN N2520		25	20	150	10.0	24.5	—			1	P334US	—	
ETEN N2520M1604W	ETEN N2520W		25	20	150	10.0	24.5	—			2	P334WS	EST32	
ETEN N2525M1604	ETEN N2525M33		25	25	150	12.5	24.5	—			1	P334US	—	
ETEN N2525M1604W	ETEN N2525M33W	●	25	25	150	12.5	24.5	—			2	P334WS	EST32	
ETEN N2525M22	ETEN N2525M43		25	25	150	12.5	24.5	30	TN□□2204	**B55~**	3	P434U	—	KY40
ETEN N2525M22W	ETEN N2525M43W	●	25	25	150	12.5	24.5	30			4	P434W	EST43	



SEC-30 Holder - General Turning and Facing
Pin Lock

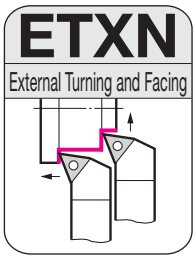


Fig 1

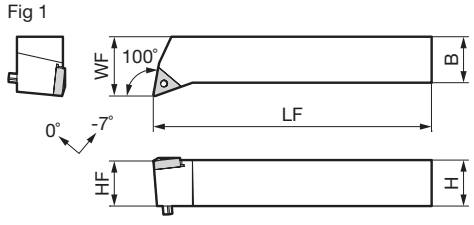


Fig 2

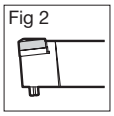


Fig 3

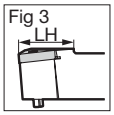


Fig 4

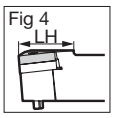


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Eccentric Pin	Shim	Wrench
ETXN R/L1212F11	ETXN R/L1212	●	●	12	12	80	16	11.5	—	TN□□1103	**B48**	1	P221US	—	KY25
ETXN R/L1616H1603	ETXN R/L1616H32			16	16	100	20	15.5	—	TN□□1603	**B49~**	1	P322US	—	KY40
ETXN R/L1616H1604	ETXN R/L1616H33	●	●	16	16	100	20	15.5	—	TN□□1604	**B50~**	1	P332US	—	KY40
ETXN R/L2020K1603	ETXN R/L2020K32			20	20	125	25	19.5	—	TN□□1603	**B49~**	1	P323US	—	KY40
ETXN R/L2020K1603W	ETXN R/L2020K32W			20	20	125	25	19.5	—			2	P323WS	EST32	
ETXN R/L2020K1604	ETXN R/L2020K33	●	●	20	20	125	25	19.5	—	TN□□1604	**B50~**	1	P333US	—	KY40
ETXN R/L2020K1604W	ETXN R/L2020K33W	●	●	20	20	125	25	19.5	—			2	P333WS	EST32	
ETXN R/L2520M1604	ETXN R/L2520			25	20	150	25	24.5	—			1	P334US	—	
ETXN R/L2520M1604W	ETXN R/L2520W			25	20	150	25	24.5	—			2	P334WS	EST32	
ETXN R/L2525M1604	ETXN R/L2525M33			25	25	150	32	24.5	—			1	P334US	—	
ETXN R/L2525M1604W	ETXN R/L2525M33W	●	●	25	25	150	32	24.5	—			2	P334WS	EST32	
ETXN R/L2525M22	ETXN R/L2525M43			25	25	150	32	24.5	30	TN□□2204	**B55~**	3	P434U	—	KY40
ETXN R/L2525M22W	ETXN R/L2525M43W	●	●	25	25	150	32	24.5	30			4	P434W	EST43	

When using handed breaker inserts for facing, the holder and insert are opposite handed.

MTJN type / MTXN type

SEC-M Holder - General Turning and Profiling
Clamp-on + Pin Lock

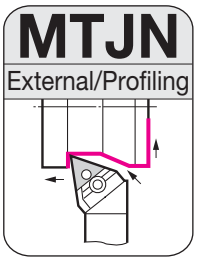


Fig 1

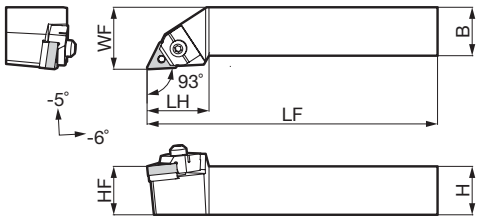


Figure shows right-handed (R) tool.

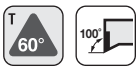
Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Wedge	Pin	Shim	Bolt	Bolt N·m	Nut	Retaining Ring	Wrench for Bolt (For Hexagonal hole)	Wrench for Nut (For Hexagonal hole)
* **MTJN R/L2020K16**	MTJN R/L2020-33	●	●	20	20	125	25	20	32	TN□□1604	**B50~**	1	MMW30	MP317S	STW323	BHA0525	**4.0**	CPM32N	ER04	LH030	LH030
** **MTJN R/L2520M16**	MTJN R/L2520-33			25	20	150	25	25	32			1		MP320S							
** **MTJN R/L2525M16**	MTJN R/L2525-33	●	●	25	25	150	32	25	32			1		MP320S							
MTJN R/L2525M22	MTJN R/L2525-43	●	●	25	25	150	32	25	38	TN□□2204	**B55~**	1	MMW40	MP420	STW434	BHA0625	**4.5**	CPM43N	ER05	LH040	LH030
MTJN R/L3225P22	MTJN R/L3225-43	●	●	32	25	170	32	32	38			1		MP420							

When using CIS standard inserts, the pin for holders marked * is MP317 and the pin for holders marked ** is MP320.



SEC-M Holder - General Turning and Facing
Clamp-on + Pin Lock

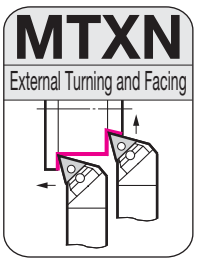


Fig 1

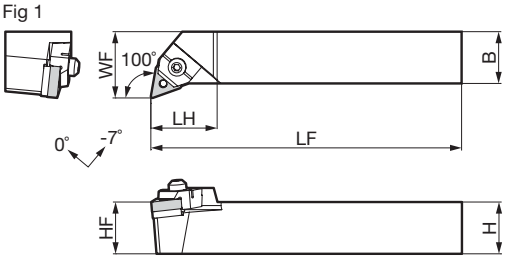


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Wedge	Pin	Shim	Bolt	Bolt N·m	Nut	Retaining Ring	Wrench for Bolt (For Hexagonal hole)	Wrench for Nut (For Hexagonal hole)
* **MTXN R/L2020K16**	MTXN R/L2020-33	●	●	20	20	125	25	20	32	TN□□1604	**B50~**	1	MMW30	MP317S	STW323	BHA0525	**4.0**	CPM32N	ER04	LH030	LH030
** **MTXN R/L2525M16**	MTXN R/L2525-33	●	●	25	25	150	32	25	32			1		MP320S							
MTXN R/L2525M22	MTXN R/L2525-43	●	●	25	25	150	32	25	38	TN□□2204	**B55~**	1	MMW40	MP420	STW434	BHA0625	**4.5**	CPM43N	ER05	LH040	LH030

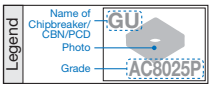
When using CIS standard inserts, the pin for holders marked * is MP317 and the pin for holders marked ** is MP320.
When using handed breaker inserts for facing, the holder and insert are opposite handed.

Applicable Inserts

◀·· DTGN type / DTFN type / PTGN type / PTTN type / PTFN type / ETGN type / ETAN type / ETFN type / ETEN type / ETXN type / MTJN type / MTXN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) —	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE **T1500Z**	GU **AC8015P**	MU **AC8025P**	EF **AC6020M**	EG **AC6020M**	EM **AC6030M**	SUMIBORON BN7125/BNC500	UZ **AC4010K**	GZ **AC4010K**	EF **AC5015S**	EG **AC5015S**	EM **AC5015S**	SUMIDIA **DA1000**	SUMIBORON **BNC2115**	SUMIBORON **BN1000**
General Machining	SU **AC8015P**	GU **AC8025P**	MU **AC8025P**	EF **AC6030M**	EG **AC6030M**	EM **AC6040M**	SUMIBORON BN7125/BNC500	GZ **AC4015K**	GZ **AC4015K**	EF **AC5015S**	EG **AC5015S**	EM **AC5025S**	SUMIDIA **DA1000**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**
Interrupted Cutting	SX **AC8025P**	UX **AC8035P**	MX **AC8035P**	EF **AC6030M**	EG **AC6040M**	EM **AC6040M**	SUMIBORON BN7125/BNC500	GZ **AC420K**	GZ **AC420K**	EF **AC5025S**	EG **AC5025S**	EM **AC5025S**	SUMIDIA **DA1000**	SUMIBORON **BNC300**	SUMIBORON **BN350**
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~	☞ A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

CTGP type / CTAP type

SEC-40 Holder - General Turning
Clamp-on

CTGP
External Turning

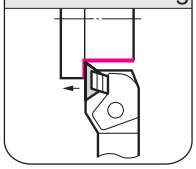


Fig 1

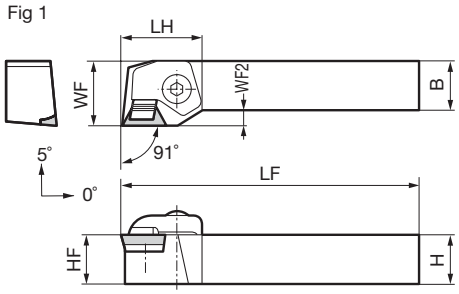


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Plate	Chipbreaker	Bolt	Shim	Shim Retainer	Spring	Wrench
																				(For Hexagonal hole)
CTGP R/L1919-L16	FP22 R/L-33	●		19	19	140	25	19	34.5	6	TP□□1603	**B111**	1	DCR/L2	CBD4R/L	BH0824R/L	STPD322	SPP3	DSP5	LH040
CTGP R/L2525-N22	FP22 R/L-44B	●		25	25	160	32	25	41	7	TP□□2204	**B115**	1	DCR/L3	CBD5R/L	BH1030R/L	STPD422	SPP3	DSP5	LH050

SEC-40 Holder - General Turning
Clamp-on

CTAP
External Turning

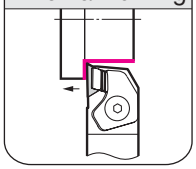


Fig 1

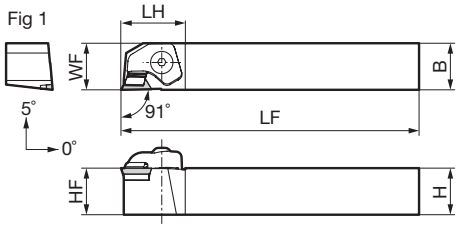


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Plate	Chipbreaker	Bolt	Shim	Shim Retainer	Spring	Wrench
																			(For Hexagonal hole)
CTAP R/L2525-N16	FP21 R/L-44A	●		25	25	160	25	25	34.5	TP□□1603	**B111**	1	DCR/L2	CBD4R/L	BH0830R/L	STPD322	SPP3	DSP5	LH040
CTAP R/L3225-N16	FP21 R/L-45A			32	25	160	25	32	34.5			1							
CTAP R/L3232-Q22	FP21 R/L-55			32	32	180	32	32	41	TP□□2204	**B115**	1	DCR/L3	CBD5R/L	BH1036R/L	STPD422	SPP3	DSP5	LH050

CTFP type

SEC-40 Holder - Facing
Clamp-on

CTFP
Facing

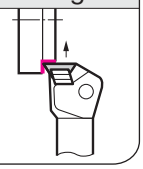


Fig 1

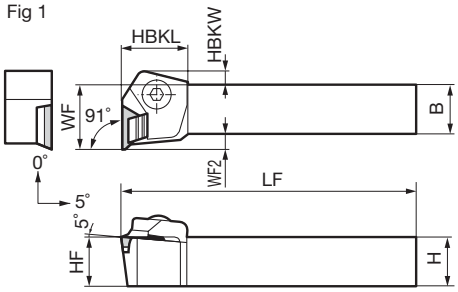


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head HBKL	Offset WF2	Step HBKW	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Plate	Chipbreaker	Bolt	Shim	Shim Retainer	Spring	Wrench
CTFP R/L1919-L16	FP25 R/L-33	●		19	19	140	25	19	26	6	8	TP□□1603	**B111**	1	DCL/R2	CBD4L/R	BH0824L/R	STPD322	SPP3	DSP5	LH040
CTFP R/L2525-N16	FP25 R/L-44A	●		25	25	160	32	25	26	7	—			1			BH0830L/R				
CTFP R/L3225-N16	FP25 R/L-45A			32	25	160	32	32	26	7	—			1	DCL/R2						
CTFP R/L2525-N22	FP25 R/L-44B	●		25	25	160	32	25	33	7	7	TP□□2204	**B115**	1	DCL/R3	CBD5L/R	BH1030L/R	STPD422	SPP3	DSP5	LH040
CTFP R/L3232-Q22	FP25 R/L-55			32	32	180	39	32	33	7	—			1	DCL/R3	CBD5L/R	BH1036L/R				

(For Hexagonal hole)

When using handed breaker inserts for facing, the holder and insert are opposite handed.

Applicable Inserts ◀·· CTGP type / CTAP type / CTFP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD, Photo, Grade — GU, AC8025P

Application range / Process	P (Steel)		K (Cast Iron)			S (Exotic Alloy)		N (Non-Ferrous)	H (Hardened Steel)
	Finishing	Medium Cutting	High-speed Finishing	Finishing to Medium Cutting	Medium to Roughing	Finishing to Medium Cutting	Medium to Roughing	—	Uncoated
General Machining	FK **T1500Z**	SF **AC8025P**	SUMIBORON **BN7125**	No Chipbreaker **AC4015K**	No Chipbreaker **AC4015K**	No Chipbreaker **AC5015S**	No Chipbreaker **AC5025S**	SUMIDIA **DA1000**	SUMIBORON **BN2000**
Recommended Cutting Conditions	☞ A10~		☞ A16~			☞ A18~		☞ A22~	☞ A20~

DVJN-J type / DVJN type

SEC-D series Holder - General Turning and Profiling
Internal Coolant Supply Double Clamp

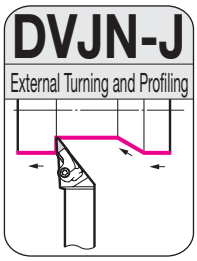


Fig 1

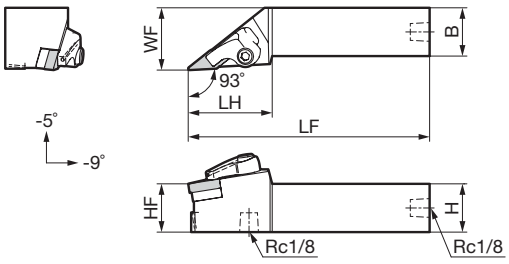


Figure shows right-handed (R) tool.

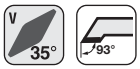
Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Insert		Fig	Clamp Plate	Cap Screw		Spring	O-ring	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Plug
	R	L	H	B	LF	WF	HF	LH	Cat. No.	Ref. Page				N·m					(For Torx hole)	For Hexagonal hole	For Hexagonal hole	
DVJN R/L2020K16-J	●	●	20	20	125	25	20	43	VN□□1604	**B60~**	1	JV R/L-01	CP-M5-20-1	**5.0**	CSP12J	SS060	VNS1604	BFTX0307N	TRX10(*)	LH040	LH025	XP02
DVJN R/L2525K16-J	●	●	25	25	125	32	25	43														

*Wrench for shim is sold separately from the main body.



SEC-D series Holder - General Turning and Profiling
Double Clamp

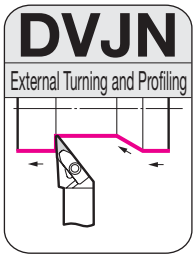


Fig 1

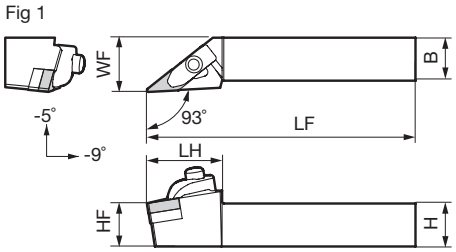


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Insert		Fig	Clamp Set		Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench
	R	L	H	B	LF	WF	HF	LH	Cat. No.	Ref. Page			N·m			(For Torx hole)	(For Hexagonal hole)	(For Hexagonal hole)
DVJN R/L2020K16	●	●	20	20	125	25	20	35	VN□□1604	**B60~**	1	SCP-4	**5.0**	VNS1604	BFTX0307N	TRX10(*)	LH040	LH025
DVJN R/L2525M16	●	●	25	25	150	32	25	35			1							

*Wrench for shim is sold separately from the main body.

Clamp Set Parts ☞C48

Note: The values in red (cutting edge WF) have been changed from those in the 2021-2022 General Catalogue.

N·m Recommended Tightening Torque (N·m)

DVVN type / DVQN type

SEC-D series Holder - General Turning and Profiling
Double Clamp

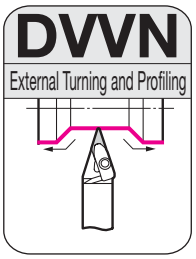
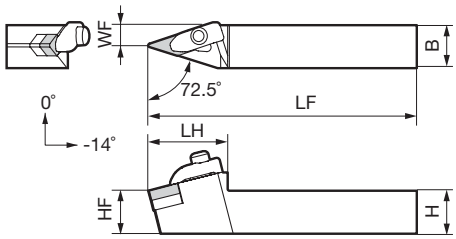


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim (For Torx hole)	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
DVVN N2020K16	●	20	20	125	10.0	20	37	VN□□1604	**B60~**	1	SCP-4	5.0	VNS1604	BFTX0307N	TRX10(*)	LH040	LH025
DVVN N2525M16	●	25	25	150	12.5	25	37			1							

*Wrench for shim is sold separately from the main body.

Clamp Set Parts ☞C48

SEC-D series Holder - General Turning, Profiling and Necking
Double Clamp

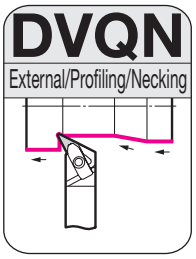


Fig 1

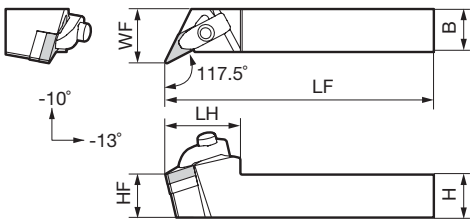


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim (For Torx hole)	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
DVQN R/L2020K16	●	●	20	20	125	25	20	35	VN□□1604	**B60~**	1	SCP-4	5.0	VNS1604	BFTX0307N	TRX10(*)	LH040	LH025
DVQN R/L2525M16	●	●	25	25	150	32	25	35			1							

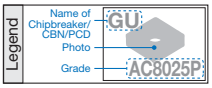
*Wrench for shim is sold separately from the main body.

Clamp Set Parts ☞C48

Applicable Inserts ◂·· DVJN-J type / DVJN type / DVVN type / DVQN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	N (Non-Ferrous) —	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	EF AC6020M	EG AC6020M	SUMIBORON BN7125/BNC500	UZ AC4010K	EF AC5015S	EG AC5015S	SUMIDIA DA1000	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	EF AC6030M	EG AC6030M	SUMIBORON BN7125/BNC500	GZ AC4015K	EF AC5015S	EG AC5015S	SUMIDIA DA1000	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	EF AC6030M	EG AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	EF AC5025S	EG AC5025S	SUMIDIA DA1000	SUMIBORON BNC300	SUMIBORON BN350	—
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A16~		☞ A18~		☞ A22~	☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

SVLC type / SVJC type

SEC-SV Mini Holder - General Turning and Profiling
Screw-on

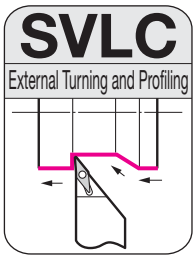


Fig 1

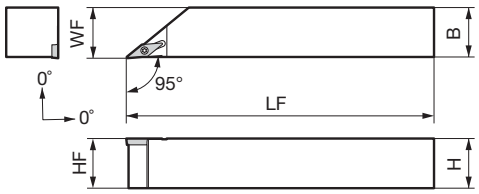


Figure shows right-handed (R) tool.

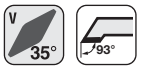
Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SVLC R/L1010-H11	●	●	10	10	100	10.5	10	VC□□1103	**B121~**	1	BFTX02508NV	**1.5**	TRX08
SVLC R/L1212-H11	●	●	12	12	100	12.5	12			1			
SVLC R/L1616-H11	●	●	16	16	100	16.5	16			1			
SVLC R/L2020-K11*	●	●	20	20	125	20.5	20			1			
SVLC R/L2525-M11	●	●	25	25	150	25.5	25			1			

* Old Cat. No. SVLC R/L 2020-H11



SEC-SV Profiling Tool Holder - For External Profiling
Screw-on

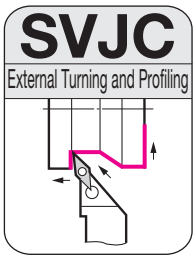


Fig 1

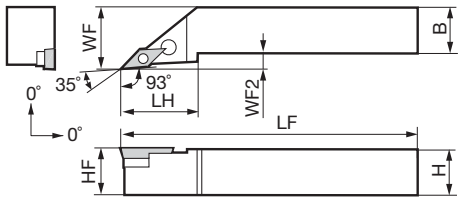


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Pin	Nut	Shim	Flat Insert Screw	N·m	Wrench (For Torx hole)	Wrench for Nut (For Hexagonal hole)
SVJC R/L2020K16	SVJC R/L2020-33	●	●	20	20	125	25	20	41	5	VC□□1604	**B122~**	1	VP20	CPV33N	SVP32	BFTX03508	**2.0**	TRX10	LH025
SVJC R/L2525M16	SVJC R/L2525-33	●	●	25	25	150	32	25	41	7			1	VP25						
SVJC R/L3225P16	SVJC R/L3225-33	●	●	32	25	170	32	32	41	7			1	VP32						

N·m Recommended Tightening Torque (N·m)

SVVC type / SVPC type

SEC-SV Profiling Tool Holder - For External Profiling
Screw-on

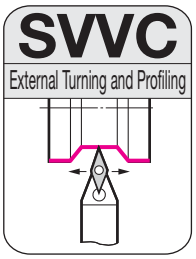
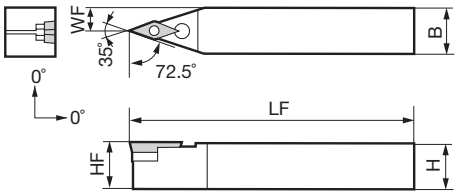


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Pin	Nut	Shim	Flat Insert Screw	N·m	Wrench (For Torx hole)	Wrench for Nut (For Hexagonal hole)
SVVC N2020K16	SVVC N2020-33	●	20	20	125	10.0	20	VC□□1604	B122~	1	VP20	CPV33N	SVP32	BFTX03508	2.0	TRX10	LH025
SVVC N2525M16	SVVC N2525-33	●	25	25	150	12.5	25			1	VP25						
SVVC N3225P16	SVVC N3225-33	●	32	25	170	12.5	32			1	VP32						

SEC-SV Profiling Tool Holder - General Turning, Facing, Profiling and Necking
Screw-on

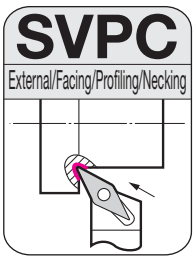


Fig 1

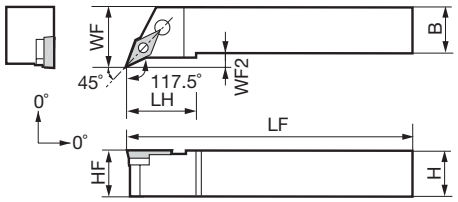


Figure shows right-handed (R) tool.

Holder

Parts

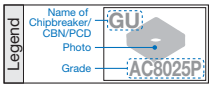
Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Pin	Nut	Shim	Flat Insert Screw	N·m	Wrench (For Torx hole)	Wrench for Nut (For Hexagonal hole)
SVPC R/L1010-H11	—	●	●	10	10	100	14.5	10	–	4.5			1							
SVPC R/L1212-H11	—	●	●	12	12	100	16.5	12	–	4.5	VC□□1103	B121~	1	—	—	—	BFTX02508NV	1.5	TRX08	—
SVPC R/L1616-H11	—	●	●	16	16	100	20.5	16	–	4.5			1							
SVPC R/L2020K16	SVPC R/L2020-33	●	●	20	20	125	25	20	35	5.0			1	VP20						
SVPC R/L2525M16	SVPC R/L2525-33	●	●	25	25	150	32	25	35	7.0	VC□□1604	B122~	1	VP25	CPV33N	SVP32	BFTX03508	2.0	TRX10	LH025
SVPC R/L3225P16	SVPC R/L3225-33			32	25	170	32	32	35	7.0			1	VP32						

Applicable Inserts ◂·· SVLC type / SVJC type / SVVC type / SVPC type

1st Recommended Insert

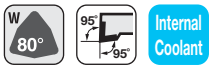
- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SU AC5015S	SU AC5025S	SUMIDIA DA1000	AG H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FF AC1030U	SI AC1030U	FF AC1030U	SI AC1030U	FF AC1030U	SI AC5015S	SUMIDIA DA1000	—	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A18~		☞ A22~		☞ A20~		☞ M2~

(N·m) Recommended Tightening Torque (N·m)

DWLN-J type / DWLN type



SEC-D series Holder - General Turning and Facing
Internal Coolant Supply Double Clamp

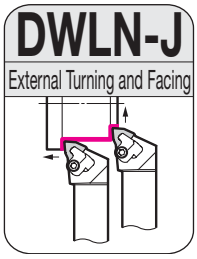


Fig 1

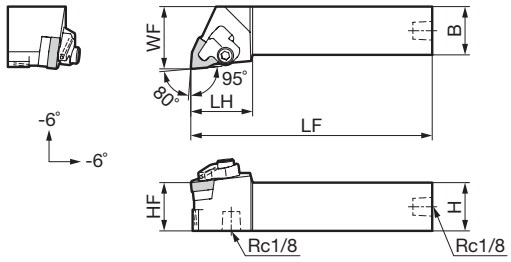


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Plate	Cap Screw	N·m	Spring	O-ring	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Plug
DWLN R/L2020K08-J	●	●	20	20	125	25	20	32	WN□□0804	**B65~**	1	JC R/L-01	CP-M5-20-1	**5.0**	CSP12J	SS060	WNS0804	BFTX0409N	TRX15(*) (For Torx hole)	LH040 For Hexagonal hole	LH025 For Hexagonal hole	XP02
DWLN R/L2525K08-J	●	●	25	25	125	32	25	32														

*Wrench for shim is sold separately from the main body.

SEC-D series Holder - General Turning and Facing
Double Clamp

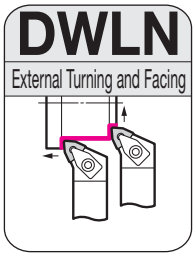


Fig 1

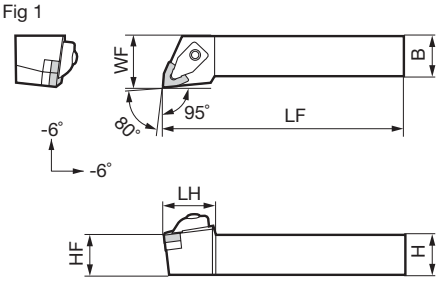


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench
DWLN R/L2020K08	●	●	20	20	125	25	20	32	WN□□0804	**B65~**	1	SCP-2	**5.0**	WNS0804	BFTX0409N	TRX15(*) (For Torx hole)	LH040 (For Hexagonal hole)	LH025 (For Hexagonal hole)
DWLN R/L2525M08	●	●	25	25	150	32	25	32			1							

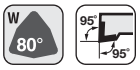
*Wrench for shim is sold separately from the main body.
When using handed breaker inserts for facing, the holder and insert are opposite handed.

Clamp Set Parts C48

Note: The values in red (cutting edge WF) have been changed from those in the 2021-2022 General Catalogue.

N·m Recommended Tightening Torque (N·m)

PWLN type / MWLN type



SEC-70 Holder - General Turning and Facing
Lever Lock

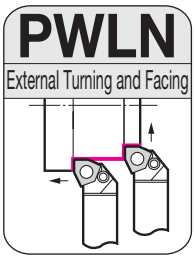


Fig 1

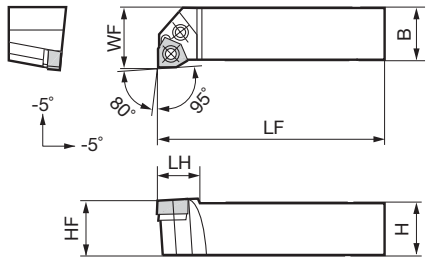


Figure shows right-handed (R) tool.

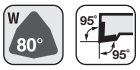
Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
PWLN R/L2020K06	PWLN R/L2020-33	●	●	20	20	125	25	20	17	WN□□0604	**B63~**	1	LCL3	LCS3	LSW317	LSP3	LH025 (For Hexagonal hole)
PWLN R/L2525M06	PWLN R/L2525-33	●	●	25	25	150	32	25	17			1					

When using handed breaker inserts for facing, the holder and insert are opposite handed.



SEC-M Holder - General Turning, Facing, Profiling and Necking
Clamp-on + Pin Lock

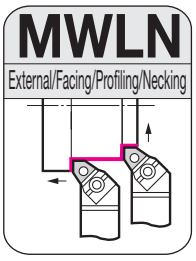


Fig 1

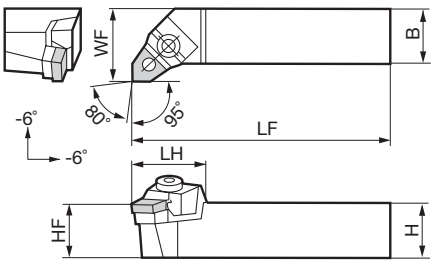


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

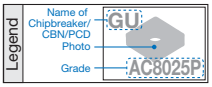
Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Wedge	Pin	Shim	Bolt	N·m	Nut	Retaining Ring	Wrench for Bolt	Wrench for Nut
MWLN R/L2020K08	MWLN R/L2020-43	●	●	20	20	125	25	20	32			1		MP416				CPM43S			
MWLN R/L2525M08	MWLN R/L2525-43	●	●	25	25	150	32	25	32	WN□□0804	**B65~**	1	MWW40	MP420	SWW433	BHA0625	4.5	CPM43N	ER05	LH040 (For Hexagonal hole)	LH030 (For Hexagonal hole)
MWLN R/L3225P08	MWLN R/L3225-43	●	●	32	25	170	32	32	32			1		MP420				CPM43N			

When using handed breaker inserts for facing, the holder and insert are opposite handed.

Applicable Inserts ◂·· DWLN-J type / DWLN type / PWLN type / MWLN type

1st Recommended Insert

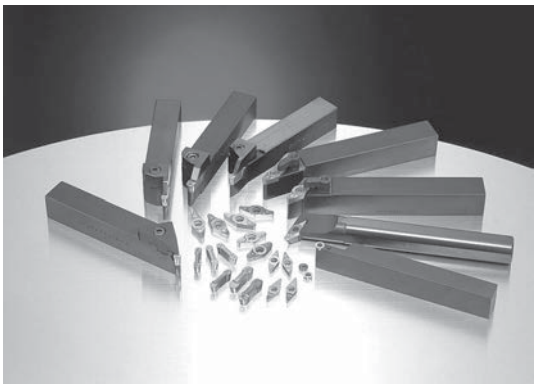
- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIBORON BNC2115	SUMIBORON BN2000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~		☞ A18~			☞ A20~	

(N·m) Recommended Tightening Torque (N·m)

MV series / GD series Profiling Tool Holders



■ General Features

With a wide range of insert shapes (35˚ diamond shaped type, dogbone type and round type) available in both cemented carbide and polycrystalline diamond grades, we are able to provide superior performance for a vast variety of applications and cutting conditions.

■ Features and Applications

- With our new range of holders for 35˚ diamond shaped inserts and AW type chipbreakers, we are able to expand our applications to cover roughing to finishing processes.
- Wide variety of dogbone inserts
  AW type chipbreakers, with their high rake design and newly designed dedicated tool holder, support a wide variety of tooling (straight, 15° angle, 45° angle)
- AW type Chipbreaker for smooth chip control
- AG type Chipbreaker for no chip adhesion on a mirror finish

■ AW type Chipbreaker

- 35° Diamond type

  VCGT220520N-AW (H1)
- Dogbone Insert

  MDE4R-AW (H1)

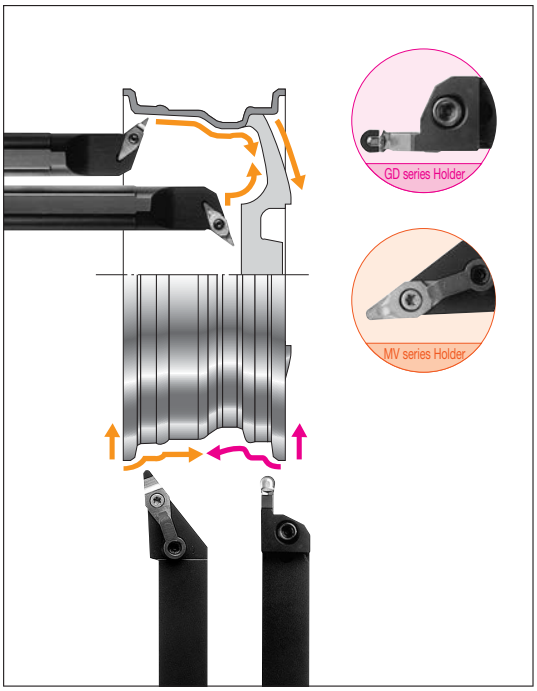
  MDE4R-AW (DA2200)

■ AG type Chipbreaker

- 35° Diamond type

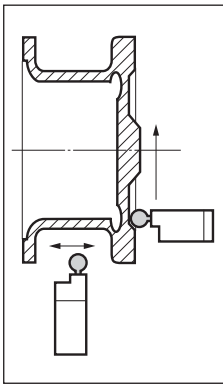
  VCGT160408N-AG (H1)

■ Series Tool type



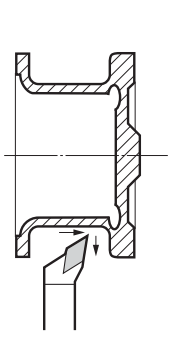
Product Name	Cat. No.	Page
SEC-GD series Holders	GDE R/L2525-600W/S	C47
	GDE R/L2525-800W/S	
	GDE R/L2525-615W/S	
	GDE R/L2525-815W/S	
	GDE R/L2525-645W/S	C47
	GDE R/L2525-845W/S	
SEC-SV series Holders	SVJC R/L2525M16	C40
	SVVC N2525M16	C41
	SVPC R/L2525M16	
SEC-MV series Holders	MVXC R/L2525Q22-20	C45
	MVXC R/L2525Q22-30	
	MVPC R/L2525Q22-20	
	MVPC R/L2525Q22-30	
SEC-D series Holders	DVJN R/L2525 M16	C38
	DVVN N2525 M16	C39
	DVQN R/L2525 M16	

■ Application Examples



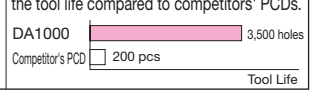
● Cutting Conditions
Tool Holder Cat. No.: GDEL2525-800W
Insert Cat. No.: MDE4R-AW
Grade: H1
n = 2,000min^{-1}
f = 0.4 to 0.6mm/rev
ap = 2.0mm Wet

● Usage Results
Excellent chip control of AW breaker guarantees an increase in productivity.

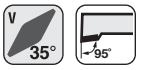


● Cutting Conditions
Tool Holder Cat. No.: SVJCL2525M16
Insert Cat. No.: VCMT160412
Grade: DA1000
vc = 2,500m/min
f = 0.35mm/rev
ap = 0.2mm Wet

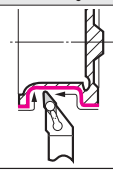
● Usage Results
Will not fracture and provides over 17 times the tool life compared to competitors' PCDs.



MV series Profiling Tool Holders



MVXC
External/Profiling/Necking



SEC-35° Diamond type - General Turning, Profiling and Necking
Screw-on + Clamp-on

Fig 1

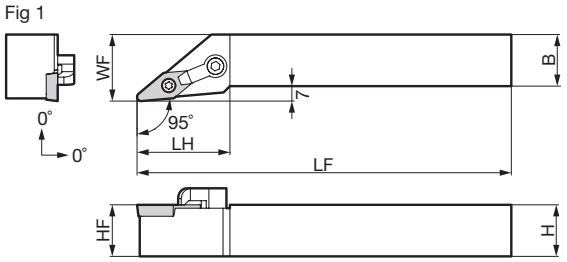


Figure shows right-handed (R) tool.

Holder

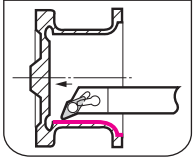
Parts

Dimensions (mm)

	Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Fig	Clamp Plate	Double Screw	Flat Head Screw	Wrench (For Torx hole)	Wrench for Clamp Plate (For Hexagonal hole)
★	**MVXC R/L2525Q22-20**	MVXC R/L2525-2220	●	●	25	25	180	32	25	45	1	CCM8-LONG	WB8-24	BFTX0515N	TRX20	LH040
☆	**MVXC R/L2525Q22-30**	MVXC R/L2525-2230	●	●	25	25	180	32	25	45	1					

★ mark: Corner Radius 2.0mm Insert, ☆ mark: Corner Radius 3.0mm Insert

MVPC
Internal/Profiling/Necking



SEC-35° Diamond type - Internal Boring, Profiling and Necking
Screw-on + Clamp-on

Fig 1

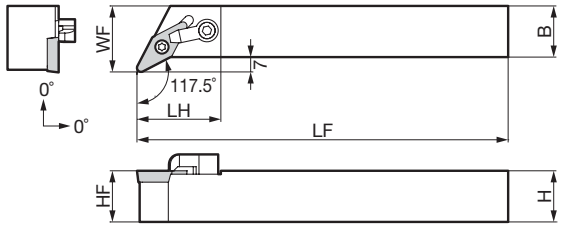


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

	Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Fig	Clamp Plate	Double Screw	Flat Head Screw	Wrench (For Torx hole)	Wrench for Clamp Plate (For Hexagonal hole)
★	**MVPC R/L2525Q22-20**	MVPC R/L2525-2220	●	●	25	25	180	32	25	41	1	CCM8-LONG	WB8-24	BFTX0515N	TRX20	LH040
☆	**MVPC R/L2525Q22-30**	MVPC R/L2525-2230	●	●	25	25	180	32	25	41	1					

★ mark: Corner Radius 2.0mm Insert, ☆ mark: Corner Radius 3.0mm Insert

Insert (35° Diamond type)

(□ Cemented Carbide / ▭ SUMIDIA) Dimensions (mm)

Shape	Cat. No.	G10E	H1	DA1000	DA2200	Inscribed Circle IC	Thickness S	Corner Radius RE		Applicable Holders
AW	**VCGT220520N-AW**	—	●	—	—	12.70	5.56	2.0	★	MVXC type (holder pictured above) MVPC type (holder pictured above)
	VCGT220530N-AW	—	●	—	—	12.70	5.56	3.0	☆	
AG	**VCGT220530N-AG**	—	●	—	—	12.70	5.56	3.0	☆	
	VCMT220520	—	—	●	▲	12.70	5.56	2.0	★	
	VCMT220530	—	—	●	▲	12.70	5.56	3.0	☆	
AW	**VCGT160408N-AW**	—	●	—	—	9.525	4.76	0.8		SVJC type C40 SVVC type C41 SVPC type C41
	VCGT160412N-AW	—	●	—	—	9.525	4.76	1.2		
AG	**VCGT160408N-AG**	—	●	—	—	9.525	4.76	0.8		
	VCGT160412N-AG	—	●	—	—	9.525	4.76	1.2		
	NF-VCMT160404	—	—	●	▲	9.525	4.76	0.4		
	NF-VCMT160408	—	—	●	▲	9.525	4.76	0.8		
	NF-VCMT160412	—	—	●	▲	9.525	4.76	1.2		
	VCMT160408	—	—	●	▲	9.525	4.76	0.8		
	VCMT160412	—	—	●	▲	9.525	4.76	1.2		
WF	**VCMT160412-WF**	—	—	●	▲	9.525	4.76	1.2		
UP	**VNMG160404N-UP**	●	—	—	—	9.525	4.76	0.4		DVJN type C38 DVVN type C39 DVQN type C39
	VNMG160408N-UP	●	—	—	—	9.525	4.76	0.8		
	NF-VNMX160404	—	—	●	▲	9.525	4.76	0.4		
	NF-VNMX160408	—	—	●	▲	9.525	4.76	0.8		
	NF-VNMX160412	—	—	●	▲	9.525	4.76	1.2		
	VNMX160404	—	—	●	▲	9.525	4.76	0.4		
	VNMX160408	—	—	●	▲	9.525	4.76	0.8		
	VNMX160412	—	—	●	▲	9.525	4.76	1.2		

VNMG1604○○N-UP (UP type Chipbreaker) is available in AC820P, AC830P, AC6030M, AC6040M and AC630M grades.

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

GD series Profiling Tool Holders

Dogbone Insert - External Turning and Profiling
Clamp-on

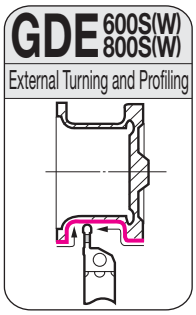


Fig 1

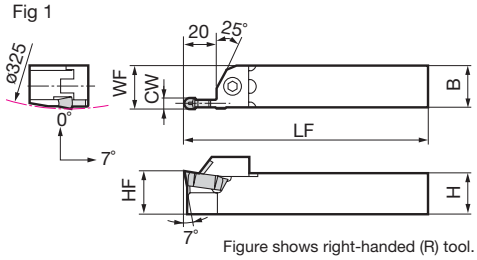


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Width of Cut CW	Group No.	Fig	Carbide Piece Clamp Plate	Special Steel Clamp Plate	Cap Screw	Wrench (For Hexagonal hole)
GDE R/L2525-600S	●	●	25	25	150	26	25	6	1	1	—	GDS600R/L	BX0625	LH050
GDE R/L2525-800S	●	●	25	25	150	26	25	8	2	1	—	GDS800R/L	BX0625	LH050
GDE R/L2525-600W	●	●	25	25	150	26	25	6	1	1	GDW600R/L	—	BX0625	LH050
GDE R/L2525-800W	●	●	25	25	150	26	25	8	2	1	GDW800R/L	—	BX0625	LH050

Refer to MDE series insert group numbers on C47 for applicable inserts.

Dogbone Insert - Facing and Internal Profiling
Clamp-on

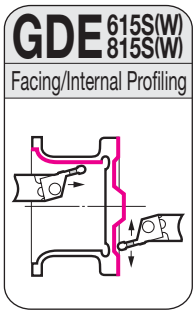


Fig 1

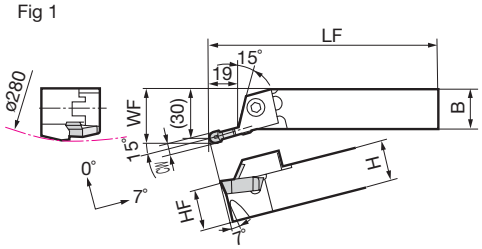


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Width of Cut CW	Group No.	Fig	Carbide Piece Clamp Plate	Special Steel Clamp Plate	Cap Screw	Wrench (For Hexagonal hole)
GDE R/L2525-615S	●	●	25	25	150	32.2	25	6	1	1	—	GDS615R/L	BX0625	LH050
GDE R/L2525-815S			25	25	150	33.2	25	8	2	1	—	GDS815R/L	BX0625	LH050
GDE R/L2525-615W	●	●	25	25	150	32.2	25	6	1	1	GDW615R/L	—	BX0625	LH050
GDE R/L2525-815W	●		25	25	150	33.2	25	8	2	1	GDW815R/L	—	BX0625	LH050

Refer to MDE series insert group numbers on C47 for applicable inserts.

GD series Profiling Tool Holders

Dogbone Insert for Internal Profiling
Clamp-on

GDE 645S(W) 845S(W)
Internal Profiling

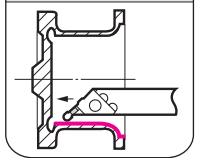


Fig 1

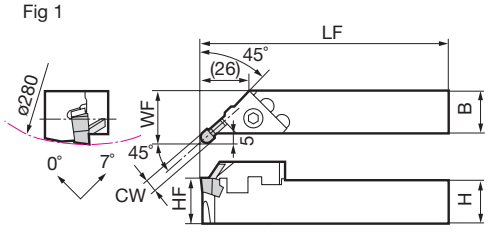


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Width of Cut CW	Group No.	Fig	Carbide Piece Clamp Plate	Special Steel Clamp Plate	Cap Screw	Wrench (For Hexagonal hole)
GDE R/L2525-645S	●	●	25	25	150	30	25	6	1	1	—	GDS645R/L	BX0625	LH050
GDE R/L2525-845S			25	25	150	30	25	8	2	1		GDS845R/L		
GDE R/L2525-645W			25	25	150	30	25	6	1	1	GDW645R/L	—		
GDE R/L2525-845W			25	25	150	30	25	8	2	1	GDW845R/L			

Refer to MDE series insert group numbers below for applicable inserts.

Insert (Dogbone type)

(▭ Carbide / ▭ SUMIDIA)

Shape	Cat. No.	Stock H1	Stock DA2200	Overall Length L	Thickness S	Corner Radius RE	Width of Cut CW	Group No.	Fig
AW	**MDE3R-AW**	●	—	26	8.5	3.0	6	1	1
	MDE4R-AW	●	—	30	8.5	4.0	8	2	
	MDE3R	—	●	26	8.5	3.0	6	1	2
	MDE4R	—	●	30	8.5	4.0	8	2	
AW	**MDE3R-AW**	—	●	26	8.5	3.0	6	1	3
	MDE4R-AW	—	●	30	8.5	4.0	8	2	

Fig 1

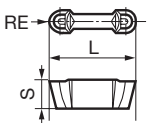


Fig 2

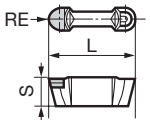
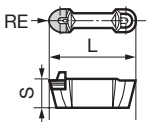


Fig 3



Clamp Set Parts

Parts

Applicable Clamp Set Cat. No.	Spring	Stock	Cap Screw	Stock	N·m
SCP-1	CSP08	●	CP-M5-20-1	●	
SCP-2	CSP08	●	CP-M5-20-1	●	
SCP-3	CSP08	●	CP-M5-20-1	●	5.0
SCP-4	CSP25	●	CP-M5-20-1	●	
SCP-5	CSP08	●	CP-M5-20-1	●	
SCP-6	CSP12	●	CP-M8-25-1	●	6.0

CP-M5-20-1 can also be fastened from the other end of the screw.

N·m Recommended Tightening Torque (N·m)

Small Lathe Tools

SumiSmall D

D1 to D29

Boring Bars E1~ Grooving / Cut-off / Threading Tools F1~

Small Lathe Tools Selection Guide ····· D2
Small Lathe Tools SumiSmall ····· D4
Insert Grade Selection Guide ····· D6
Chipbreaker Selection ····· D7

External Holders	Special Tool Holders for Small Product Machining	SEC-PB Tool Holders SPB series ····· D8
		SEC-Wide-Cut Holders SGW series ····· D10
		SEC-Mini Tool Holders SBT series / PBT series ··· D11
		SEC-Front Turning Tool Holders SFT series ····· D12
	SEC-Round Shank Tool Holders	RS-SCL type ····· D13
		RS-SDU type / RS-SDX type ····· D14
		RS-SVX type / RS-SVVP type ····· D15
		RS-PTXN type ····· D16
	SEC-Mini Tool Holders Zero Offset Holders	PCLC-X type / SCLC-X type / SCAC-X type ····· D17
		PDJC-X type / SDJC-X type ····· D18
		SDAC-X type / SDPC-X type ····· D19
		SVJC-X type / PTXN-X type ····· D20
	SEC-Mini Tool Holders PC series / SC series	PCLC type / SCLC type ····· D22
		SCAC type ····· D23
	SEC-MINI Tool Holders PD series / SD series	PDJC type / SDJC type ····· D24
		SDAC type / SDNC type ····· D25
	SEC-Mini Tool Holders SS series	SSBC type ····· D26
	SEC-Mini Tool Holders ST series	STGC type / STAC type ····· D27
	SEC-Mini Tool Holders SV series (7° Positive)	SVLC type / SVPC type ····· D28
	SEC-Mini Tool Holders SV series (11° Positive)	SVLP type / SVPP type ····· D29

E Boring Bars

Multi-functional Small Lathe Tools ····· E16
SEC-Boring Bars (for Bottom Facing) ····· E18
SEC-Boring Bars (for Profiling) ····· E26
SEC-Boring Bars (for Through Boring) ····· E36
SEC-Boring Bars (for Stop Boring) ····· E42
SEC-MINI Boring Bars ····· E66

F Grooving / Cut-off / Threading Tools

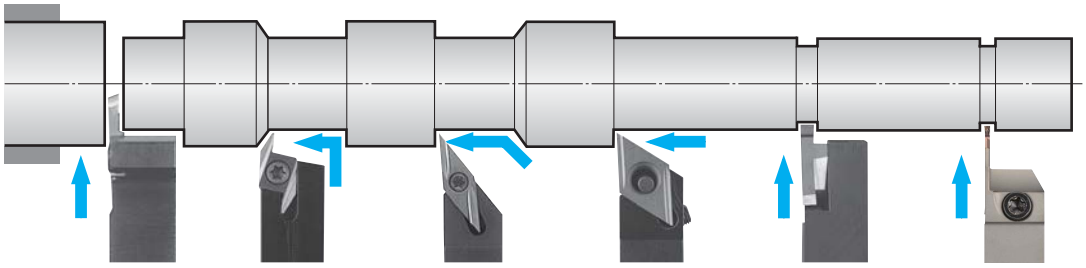
SEC-Grooving Tools (External) ····· F4
SEC-Grooving Tools (Internal) ····· F56
SEC-Small Diameter Cut-off Tool Holders ····· F78
SEC-Threading Tools (External) ····· F102, F110
SEC-Threading Tools (Internal) ····· F102, F115

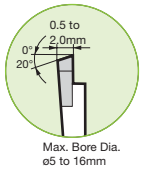
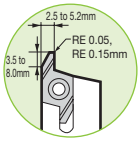
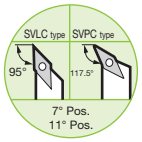
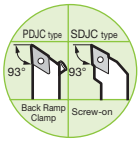
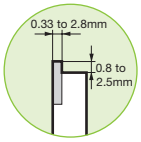
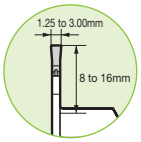
Stock Markings and Symbols

● ● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

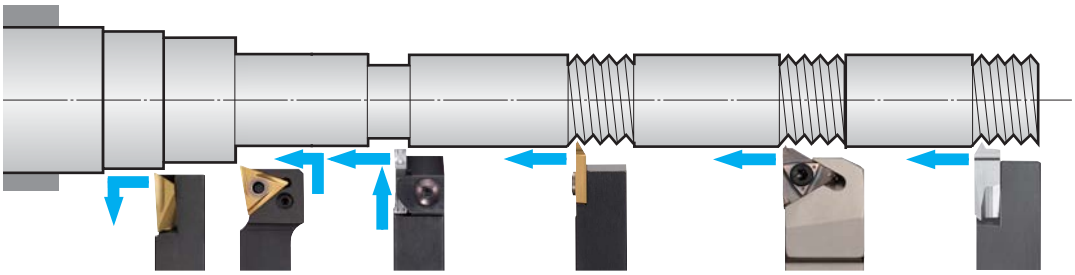
Small Lathe Tools Selection Guide

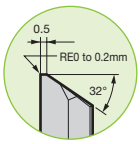
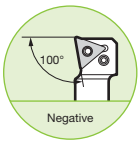
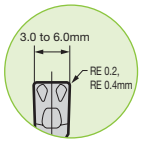
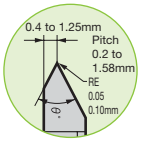
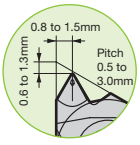
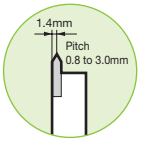
External Turning (1)



Application/Type/Page	Cut-off	Back Turning	Profiling	General External Turning	Grooving	Grooving & Cut-off
	SCT type	SBT series PBT series	SV series	PD/SD series	GWC series	GND series
	☞F78~	☞D11	☞F28~	☞D24, D25	☞F4	☞F10~
Cutting Edge Shape						

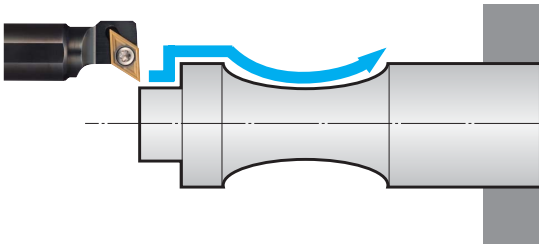
External Turning (2)



Application/Type/Page	Turning	Turning	Grooving Traverse Cut	Threading	Threading	Threading
	SFT series	PTXN-X type	SGE series	STH series	SSTE type	THE series
	☞D12	☞D20	☞F54	☞F110	☞F102~	☞F114
Cutting Edge Shape						

External Turning (3)

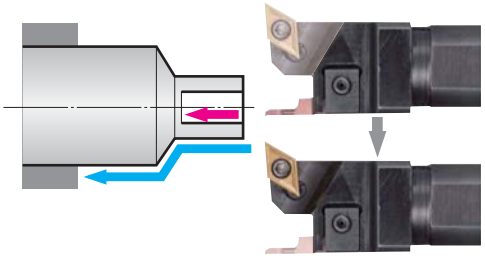
External turning made possible with holder sleeves.



Application/Type/Page	Round Shank Holder
	RS series
	☞D13 to D16

Multi-functional Tool

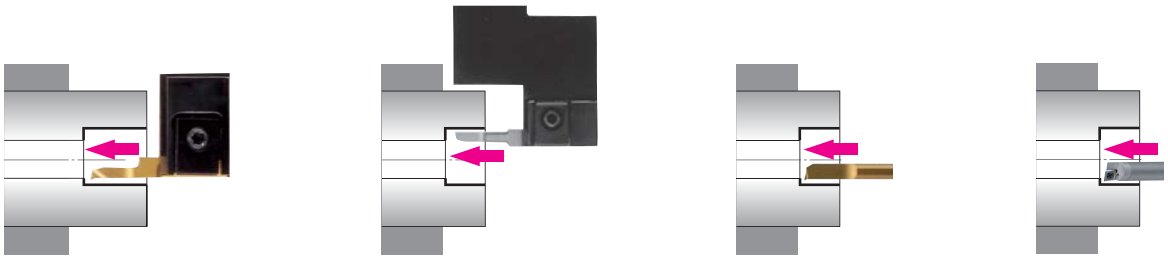
A single holder capable of performing two operations.



Application/Type/Page	Twin Head Holder	
	I.D. + O.D. CKBE type	I.D. + I.D. CKBB type
	☞E16	☞E17

Small Lathe Tools Selection Guide

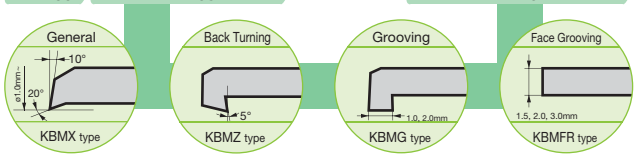
Internal Boring (1) Machining of very small diameters ø1mm and above



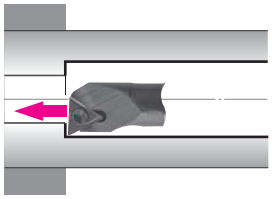
Application/Type/Page

- **Very Small Dia. Boring** — Square Shank: CKB series; Round Shank: S-CKB type / S-CKB-S type — E66, E68
- **Very Small Dia. Boring** — Square Shank L type Gang type Toolpost: CKBS type — E67
- **Solid Carbide Bar** — BXBR series (Expansion) — E72~
- **Small Hole Boring Bars** — SEXC series (Expansion) — E76

Cutting Edge Shape



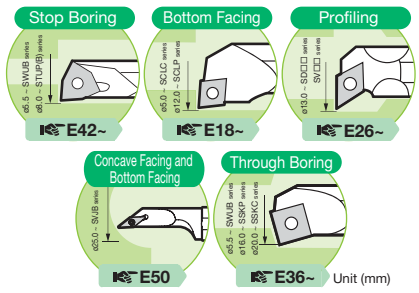
Internal Boring (2) Machining of small diameters ø5mm and above



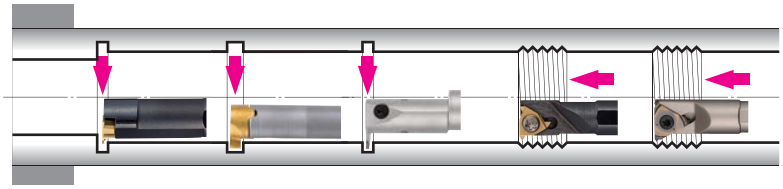
Application/Type/Page

- **Boring** — SW type/ST type/SC type/SD type/SV type/SS type — E18 to E63

Cutting Edge Shape



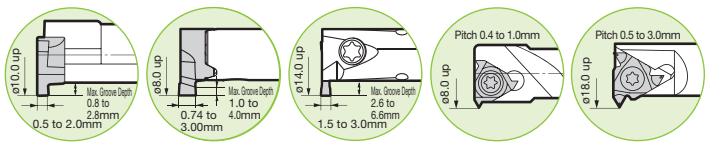
Internal Grooving and Threading



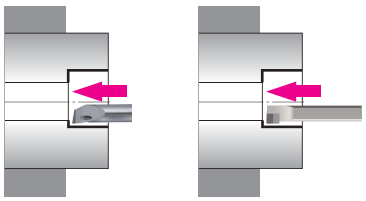
Application/Type/Page

- **Internal Grooving** — SGIT series — F57
- **Internal Grooving** — SSH series (Expansion) — F58~
- **Internal Grooving** — GNDIS type — F46~
- **Internal Threading** — STHI series — F116
- **Internal Threading** — SSTI type — F102~

Cutting Edge Shape



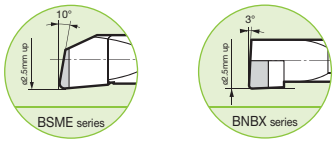
SUMIBORON (CBN) Small Hole Boring Bars



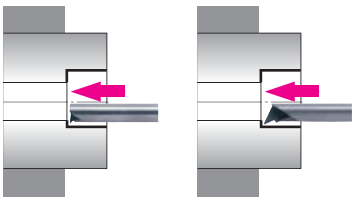
Application/Type/Page

- **Small Hole Boring Bars** — BSME series — E75
- **Small Hole Boring Bars** — BNBX series — E78

Cutting Edge Shape



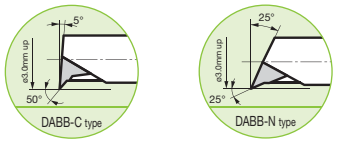
SUMIDIA (PCD) Small Hole Boring Bars



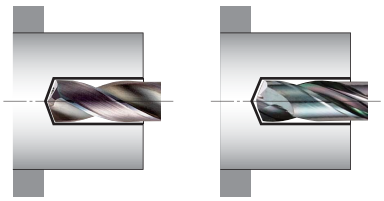
Application/Type/Page

- **Small Hole Boring Bars** — DABB-C type — E81
- **Small Hole Boring Bars** — DABB-N type — E81

Cutting Edge Shape



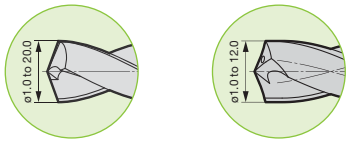
Drilling



Application/Type/Page

- **General-purpose** — MultiDrill NeXEO: MDE series — J8~
- **For Aluminum Alloy** — MULTIDRILL: MDA series (New) — J84~

Cutting Edge Shape



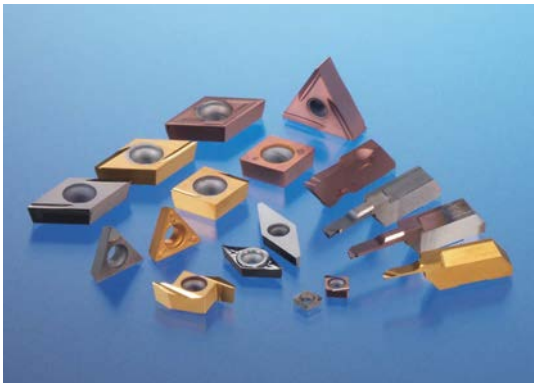
SumiSmall

■ General Features

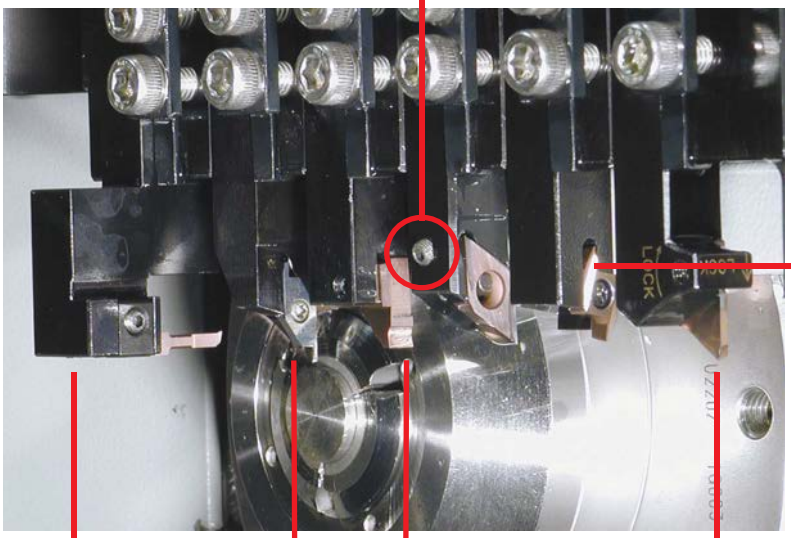
In 1984, Sumitomo Electric Hardmetal first released the SEC-MINI Tool Holder series for small product machining in small NC autolathes. Through these years of experience, new tool designs including our side lever lock tool holder were developed to meet various machining requirements such as back turning, profiling and cut-off; we continually strive to enhance the series.

SumiSmall

■ Full Lineup of Grades from Carbide to PCD



☞D6~



■ Special Tools for Small Lathes to Cover Various types of Machining

● MINI Boring Bar CKB series

Min. bore diameter ø1 to ø5mm

☞E66~

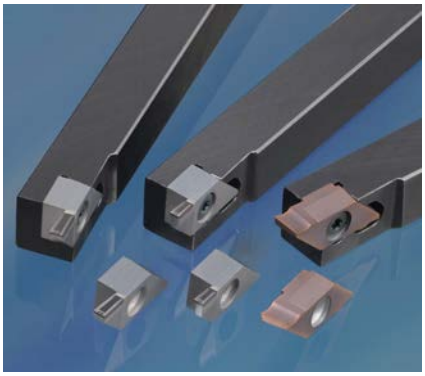
● Very Small Diameter Part Turning Tool SPB series

Best suited for very small parts with diameter of less than ø10mm

☞D8~

● Wide-Cut Holders SGW series

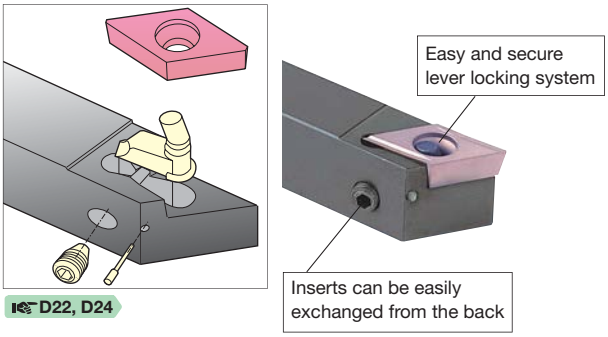
Ideal for high-efficiency machining of long parts, eliminating chip control issues



☞D10

■ A Wide Selection of Easy-to-Use Holders

● PC/PD type Back Clamp Tool Holders



☞D22, D24

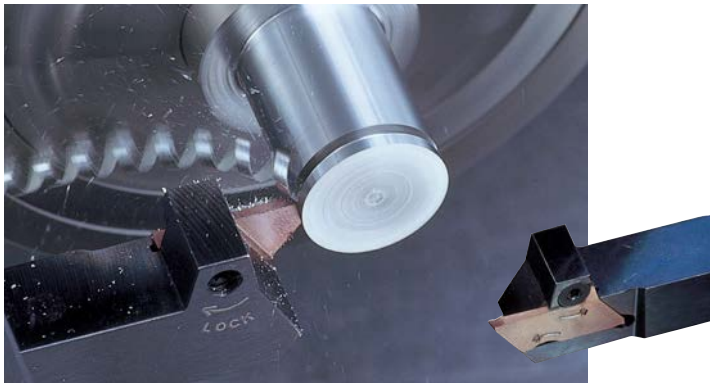
● Back-Turning Tool Holder SBT series / PBT series

Sharp cutting edge produces good surface finish
Maximum machining step 8.0mm, width of cut 2.5mm

☞D11

● Cut-off Tool SCT type

Inserts can be changed easily even from the back, simply by loosening the screw
Maximum cut-off diameters: ø5mm, ø12mm, ø16mm



☞F78~

● Zero Offset Holders *Products with part number suffix "-X"

Tool compensation not required for small gang-type lathes ☞D17~

● Twin Head Holder

Multi-functional Autolathe Tool
One holder performing 2 different operations ☞E16~

● Round Shank Holder RS series

External turning made possible with holder sleeves ☞D13~

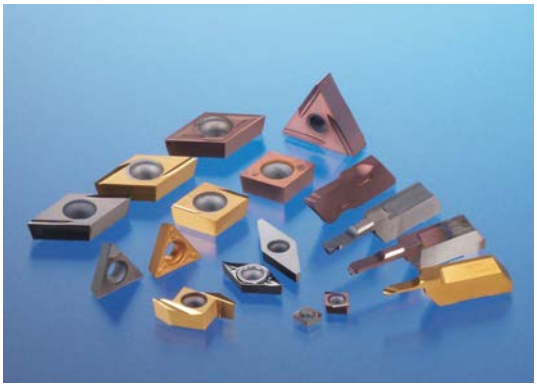
● SEC-Grooving Tools SSH series Expansion

Internal coolant supply enables superb chip control, while the tough carbide body allows stable machining
Supports internal grooving of ø8mm up ☞F58~

● SEC-Grooving Tools GND series

Lineup includes shanks for small lathes
Suitable for grooving at 1.25mm up
Internal coolant supply type now available in the series ☞F10~

Insert Grade Selection Guide



In 1984, Sumitomo Electric Hardmetal first released the SEC-MINI Tool Holder series for small product machining in small NC autolathes.
A full range of insert grades including AC530U and AC1030U as well as Cermet T1500A, Cemented Carbide BL130, SUMIBORON BN2000, and SUMIDIA DA1000 are available to meet a variety of machining requirements.
In addition to the high-precision grade ACZ150, AC1030U has been added to support an even wider range of precision application requirements, from automotive to electrical component machining.

■ Insert Grade Selection Guide

Insert Grades	Application Range: High-precision	Application Range: Finishing to Light Cutting	Application Range: Medium Cutting	Applicable Work Material: P General Steel	P Stainless Steel	M Cast Iron	K Non-Ferrous Metals	N Heat-Resistant Alloy	S Hardened Steel	H
Coated Carbide (PVD)	ACZ150			◎	◎		○			
	AC5015S			○	◎	○		◎		
	AC5025S			○	◎	○		◎		
	AC530U			◎	◎	○	○	○		
	AC1030U			◎	◎	○	○	○		
Uncoated Cermet Coated Cermet	T1000A			◎	○	◎	○			
	T1500A/T1500Z			◎	○	○	○			
Cemented Carbide	BL130			○	○	○	○			
	H1			○	○	○	◎			
	EH510			○	○	○	○	◎		
CBN (SUMIBORON)	BN1000/BN2000									◎
	New BN7125					◎		○		
PCD (SUMIDIA)	DA1000						◎			

◎ 1st Recommendation ○ 2nd Recommendation

■ Recommended Cutting Conditions

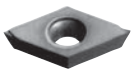
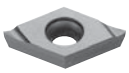
(Red text: 1st recommendation, Blue text: 2nd recommendation)

Work Material / Tool Grade	P Free-Cutting Steel vc (m/min)	P Free-Cutting Steel f (mm/rev)	P Carbon Steel vc (m/min)	P Carbon Steel f (mm/rev)	M Stainless Steel vc (m/min)	M Stainless Steel f (mm/rev)	S Heat-Resistant Alloy vc (m/min)	S Heat-Resistant Alloy f (mm/rev)	H Hardened Steel vc (m/min)	H Hardened Steel f (mm/rev)	N Aluminum Alloy vc (m/min)	N Aluminum Alloy f (mm/rev)	N Brass vc (m/min)	N Brass f (mm/rev)
ACZ150	50 to 200	0.02 to 0.10	50 to 150	0.01 to 0.08	50 to 150	0.01 to 0.05					70 to 300	0.05 to 0.20	70 to 300	0.05 to 0.20
AC5015S	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 200	0.02 to 0.10	30 to 100	0.02 to 0.10					70 to 300	0.05 to 0.20
AC5025S	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 200	0.02 to 0.10	30 to 100	0.02 to 0.10					70 to 300	0.05 to 0.20
AC530U	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 200	0.02 to 0.10							70 to 300	0.05 to 0.20
AC1030U	50 to 200	0.02 to 0.15	50 to 150	0.02 to 0.10	50 to 150	0.02 to 0.10							70 to 300	0.05 to 0.20
T1000A	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 150	0.02 to 0.10					70 to 300	0.05 to 0.20	70 to 300	0.05 to 0.20
T1500A	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 150	0.02 to 0.10					70 to 300	0.05 to 0.20	70 to 300	0.05 to 0.20
T1500Z	50 to 200	0.02 to 0.15	50 to 200	0.02 to 0.10	50 to 150	0.02 to 0.10					70 to 300	0.05 to 0.20	70 to 300	0.05 to 0.20
BN1000									120 to 300	0.03 to 0.15				
BN2000									50 to 200	0.03 to 0.20				
BN7125							50 to 200	0.05 to 0.25						
DA1000											70 to 300	0.02 to 0.10	70 to 300	0.02 to 0.10

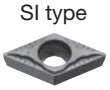
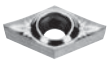
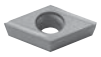
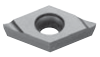
Chipbreaker Selection

■ Insert Series

● Insert Precision Selection Guide

	E Class	G Class	M Class
Insert Class			
Height Tolerance	±0.025mm	±0.13mm	±0.13mm
Features	Peripheral faces are ground Thickness tolerances are tighter than G class inserts	Peripheral faces are ground	Peripheral faces have a sintered finish
Applications	High-precision to finishing	Finishing to Light Cutting	Roughing to Light Cutting
Cat. No.	CCET09T302R-FX DCET0702018L-FY	CCGT09T304R-FX DCGT11T302MN-SI(*)	CCMT09T304N-LU DCMT070208N-SU

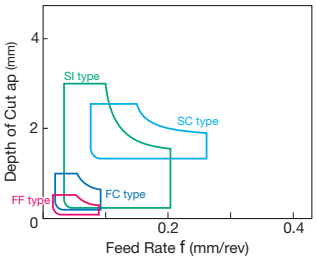
● Chipbreaker Selection

	Representative example	Features
Molded type	FC type SI type  AG type 	3D chipbreaker with good chip evacuation and sharp cutting edge.
Parallel type	FX type 	Best suited for general-purpose external finishing with larger depths of cut.
Wide type	FYS type FY type 	Suppresses burrs in necking operation. Suppresses chattering during facing and external turning operations.

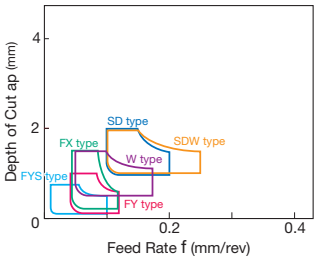
(*) Catalogue numbers with a feed direction symbol prefixed with "M" means that the product has a corner radius with negative tolerance.

■ Application Range of Chipbreakers for Finishing to Light Cutting

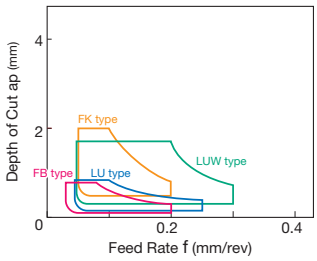
● G Class Chipbreaker



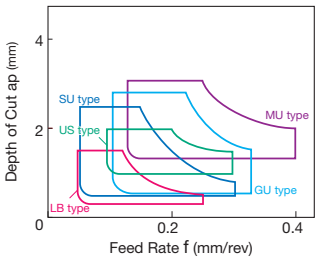
● G Class Ground type



● M Class Finishing to Light Cutting

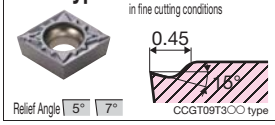


● M Class Light Cutting

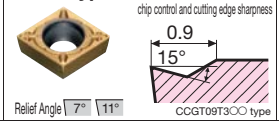


■ Chipbreakers for Finishing to Light Cutting

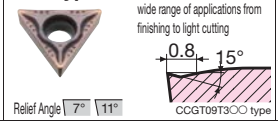
Positive type G Class

FF type (New) — P M K N S H
Realises outstanding chip evacuation in fine cutting conditions


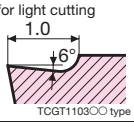
Relief Angle 5° 7° — CCGT09T3○○ type

FC type — P M K N S H
Peripheral ground 3D breaker with good chip control and cutting edge sharpness


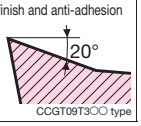
Relief Angle 7° 11° — CCGT09T3○○ type

SI type — P M K N S H
Sharp-edged chipbreaker for a wide range of applications from finishing to light cutting


Relief Angle 7° 11° — CCGT09T3○○ type

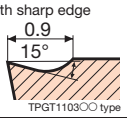
SC type — P M K N S H
Two-step breaker for light cutting


Relief Angle 7° — TCGT1103○○ type

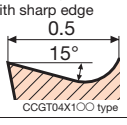
AG type — P M K N S H
Al chipbreaker for mirror finish and anti-adhesion


Relief Angle 7° — CCGT09T3○○ type

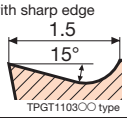
Positive type G Class (Ground type)

FX type — P M K N S H
Parallel breaker with sharp edge


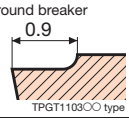
Relief Angle 5° 7° 11° — TPGT1103○○ type

FYS type — P M K N S H
Fine cutting breaker with sharp edge


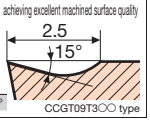
Relief Angle 5° 7° — CCGT04X1○○ type

FY type — P M K N S H
Wide breaker with sharp edge


Relief Angle 5° 7° 11° — TPGT1103○○ type

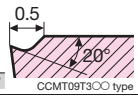
SD type — P M K N S H
Stepped parallel ground breaker


Relief Angle 7° 11° — TPGT1103○○ type

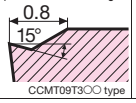
AY type — P M K N S H
High-quality ground aluminum breaker achieving excellent machined surface quality


Relief Angle 5° 7° 11° — CCGT09T3○○ type

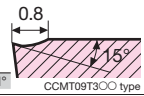
Positive type M Class

FB type — P M K N S H
Finishing chipbreaker for mild steel turning with excellent chip control and surface finish


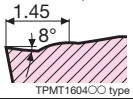
Relief Angle 5° 7° 11° — CCMT09T3○○ type

LU type — P M K N S H
Chip control significantly improved in fine cutting


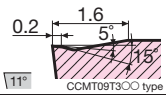
Relief Angle 5° 7° 11° — CCMT09T3○○ type

LB type — P M K N S H
Light-cutting breaker with sharp edge and good chip control


Relief Angle 5° 7° 11° — CCMT09T3○○ type

SU type — P M K N S H
General purpose chipbreaker with excellent sharpness


Relief Angle 7° 11° — TPMT1604○○ type

GU type — P M K N S H
General-purpose Chipbreaker: 1st Recommendation


Relief Angle 5° 7° 11° — CCMT09T3○○ type

Applicable Work Materials: P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

SPB series

■ Features

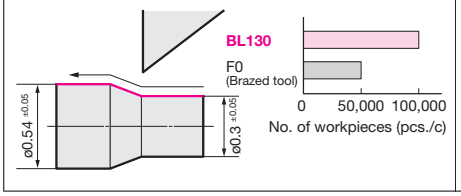
- High rigidity type tools for gang-type NC lathes
- Inserts for various applications can be used on a single holder
- Can also be used on turret-type toolposts
- Uncoated insert blanks are stocked so cutting edges can be ground as required
- BL130 has wear resistance similar to coated grades and sharpness similar to uncoated grades
- Ultra-fine grained cemented carbide grade F1, typically used for brazed tools, is now available for indexable inserts

■ Grade Application

Applicable Work Material / Insert Grade	General Steel/ SK Material	Stainless Steel: Austenitic	Stainless Steel: Martensitic Ferritic	Brass/ Aluminum Alloy
BL130	○	○	◎	○
F1	○	◎	○	○

■ Application Examples

Watch component



Tool: BL130 (PBVFN1102R)
Work Material: SUS420F
Cutting Conditions:
VC = 7 to 11m/min
f = 0.006mm/rev

Very Small Diameter Part Turning
Screw-on

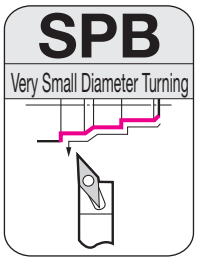


Fig 1

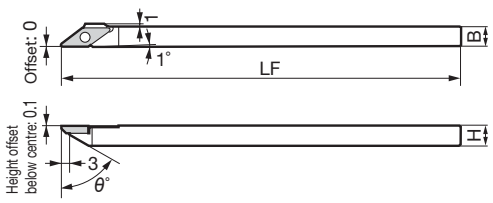


Fig 2

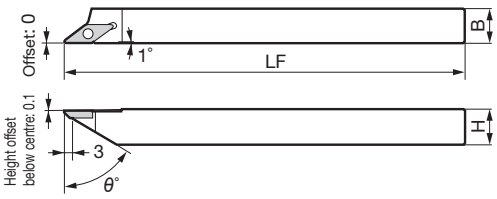


Fig 3

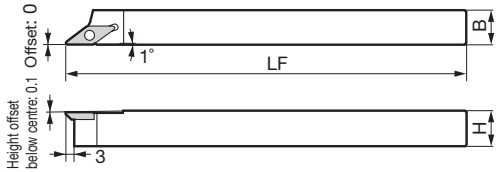


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Toolpost	Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Relief Angle θ°	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Turret type	**SPB R/L0707-70**		●	7	7	140	70	1	BFTX02505N	1.1	LT08-06
	SPB R/L0808-60	●		8	8	140	60	2	BFTX02506N	1.5	
	SPB R/L0808-70		●	8	8	140	70	2	BFTX02505N	1.1	
	SPB R/L0909-70		●	9.5	9.5	140	70	2	BFTX02505N	1.1	
	SPB R/L1010-60	●		10	10	140	60	2	BFTX02506N	1.5	
	SPB R/L1212-60	●		12	12	140	60	2	BFTX02506N	1.5	
Gang type	**SPB R/L0808**	●	—	8	8	140	—	3	BFTX02506N	1.5	LT08-06
	SPB R/L1010	●	—	10	10	140	—	3	BFTX02506N	1.5	
	SPB R/L1212	●	—	12	12	140	—	3	BFTX02506N	1.5	

N·m Recommended Tightening Torque (N·m)

Inserts

(Cemented Carbide)

Insert Blank

Dimensions (mm)

Cat. No.	Stock BL130 R	Stock BL130 L	Stock F1 R	Stock F1 L	Overall Length L	Applications	Fig
PBVX 1102 R/L-NB	●	●	●	●	17.2	Wide Range	1
PBVX 1102 R/L-SB	●	●	●	●	(20.14)	Sharp edge	2
PBVX 1102 R/L-BB	●	●	●	●	17.2	Special	3

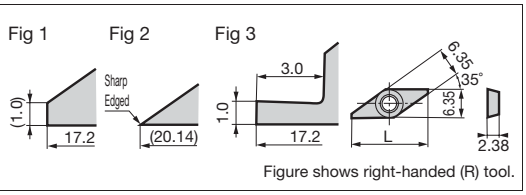


Figure shows right-handed (R) tool.

( ) is a reference value

Front Turning Insert

Dimensions (mm)

Cat. No.	Stock BL130 R	Stock BL130 L	Stock F1 R	Stock F1 L	Effective Cutting Edge Length	Wiper Edge	Fig
PBVFW 1102 R/L	●				1.0	Yes	1
PBVFN 1102 R/L	●				1.0	No	2

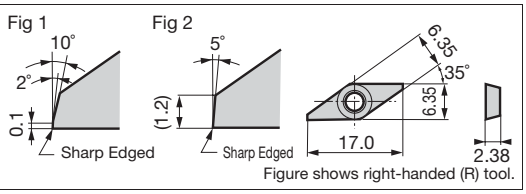


Figure shows right-handed (R) tool.

( ) is a reference value

Back Turning Insert

Dimensions (mm)

Cat. No.	Stock BL130 R	Stock BL130 L	Stock F1 R	Stock F1 L	Effective Cutting Edge Length	Wiper Edge	Fig
PBVBW 1102 R/L	●				1.0	Yes (2°)	1
PBVBN 1102 R/L	●				1.0	No (5°)	2

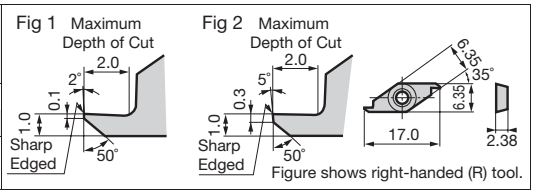


Figure shows right-handed (R) tool.

Grooving Insert

Dimensions (mm)

Cat. No.	Stock BL130 R	Stock BL130 L	Stock F1 R	Stock F1 L	Machining Groove Depth CDX	Width of Cut CW	Fig
PBVG 1102 R/L-030	●				0.5	0.3	1
PBVG 1102 R/L-050	●				1.0	0.5	1
PBVG 1102 R/L-100	●				2.0	1.0	1

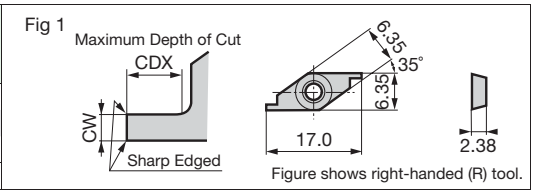
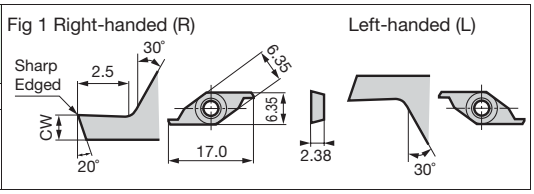


Figure shows right-handed (R) tool.

Cut-off Insert

Dimensions (mm)

Cat. No.	Stock BL130 R	Stock BL130 L	Stock F1 R	Stock F1 L	Max. Cut-off Dia.	Width of Cut CW	Fig
PBVC 1102 R/L-50	●	●			5.0	1.0	1



Threading Insert

Dimensions (mm)

Cat. No.	Stock BL130 R	Stock BL130 L	Stock F1 R	Stock F1 L	Process Pitch	Fig
PBVTF 1102 R/L	●				0.2 to 0.5	1
PBVTB 1102 R/L	●				0.2 to 0.5	2

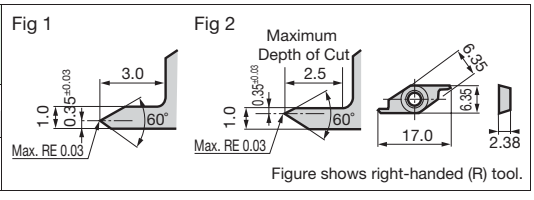


Figure shows right-handed (R) tool.

Recommended Cutting Conditions

Work Material	P Free-Cutting Steel	P Carbon Steel	M Stainless Steel	N Non-Ferrous Metal
Cutting Speed **vc** (m/min)	5 to 80	5 to 80	5 to 50	5 to 100
Feed Rate **f** (mm/rev)	0.003 to 0.05			
Coolant	Wet (oil-based)			

SGW series

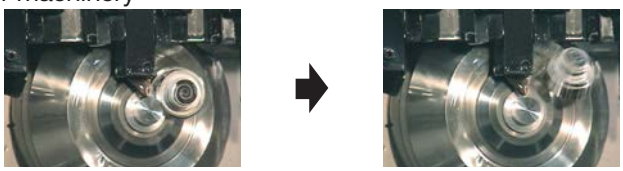
VIDEO OF CUTTING

■ SUMIDIA Multi-Function Tool with Chipbreaker SUMIDIA BREAK MASTER LD type

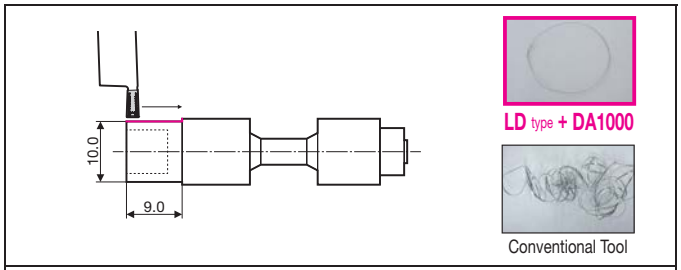
- Provides excellent chip control in traverse cutting and grooving of aluminum alloy.
- Solves chip control problems and dramatically improves work efficiency.
- Achieves long, stable tool life by employing high-toughness grade SUMIDIA DA1000.

■ Features

- Enables high-efficiency roughing of long parts
- Coin-shaped chips are less likely to tangle with work material or machinery



■ Application Examples



Work Material: Valve (A6061) Tool Cat. No.: KGV R2004-LD (DA1000)
Cutting Conditions: vc = 250m/min, f = 0.10mm/rev, ap = 0.5mm Wet

SGW
External Turning

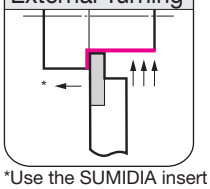
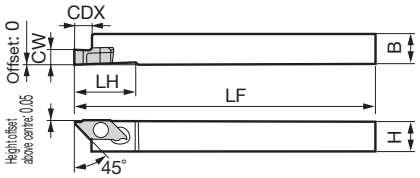
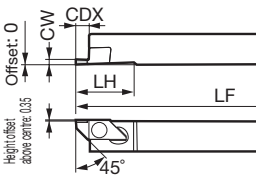


Fig 1



Dimensions with SUMIDIA insert mounted



External Multi-purpose type (Grooving/Traverse Cutting) Screw-on

*Use the SUMIDIA insert for traverse cutting.

Holder

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Maximum Groove Depth CDX	Head Length LH	Fig	Parts: Flat Insert Screw		Parts: Wrench
									N·m	(For Torx hole)
SGW R1212	●	12	12	120	7.0	24.5	1	BFTX0410T8R	1.1	TRX08
SGW R1616	●	16	16	120	7.0	24.5	1			

The above dimensions for LF, CDX and LH are values with a carbide insert mounted. (Refer to the table below for dimensions with SUMIDIA insert mounted)

Insert (Carbide) (Coated Carbide)

Dimensions (mm)

Cat. No.	AC1030U	AC530U	Width of Cut CW	Overall Length L	Overall Length LF	Maximum Groove Depth CDX	Head Length LH	Effective Length	Fig
KGV R400	●	●	4.0	21.0	120	7.0	24.5	6.3	1
KGV R500	●	●	5.0	21.0	120	7.0	24.5	6.3	1
KGV R600	●	●	6.0	21.0	120	7.0	24.5	6.3	1

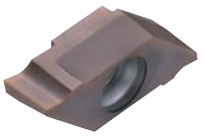
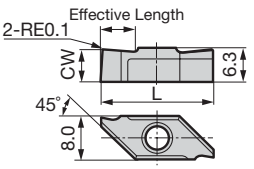


Fig 1



Insert (SUMIDIA) (SUMIDIA)

Dimensions (mm)

Cat. No.	DA1000	Width of Cut CW	Overall Length L	Overall Length LF	Maximum Groove Depth CDX	Head Length LH	Effective Length	Fig
KGV R2004-LD	●	2.0	19.7	118.7	5.0	23.2	4.0	1
KGV R2504-LD	●	2.5	19.7	118.7	5.0	23.2	4.0	1
KGV R2506-LD	●	2.5	21.2	120.2	6.5	24.7	5.5	1

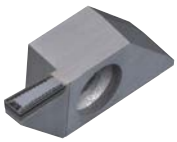
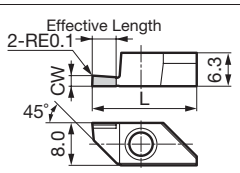


Fig 1



The above dimensions for LF, CDX and LH are the holder dimensions with insert mounted.

Note: The values in red (maximum groove depth CDX) have been changed from those in the 2021-2022 General Catalogue.

Recommended Cutting Conditions

Work Material	P Steel M Stainless Steel N Non-Ferrous Metal	N Non-Ferrous Metal	
Insert Grades	AC1030U	DA1000	
Machining Details	Grooving	Grooving	Traverse Cutting
Spindle Speed n (min^{-1})	4,000 to 6,000	4,500 to 8,000	4,500 to 8,000
Feed Rate f (mm/rev)	0.05 to 0.15	0.07 to 0.15	0.07 to 0.15
Coolant	Wet (oil-based)		

Be careful with spindle power during use. For small lathes, insufficient spindle power during machining may cause the machine to stop.
Be careful when machining carbon steel and stainless steel in particular.

N·m Recommended tightening torque (N·m) Note: Regrinding the SUMIDIA BREAK MASTER LD type will adversely affect chip evacuation performance.

SBT series/PBT series

SBT
Back Turning

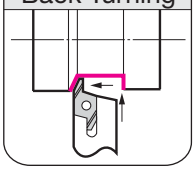


Fig 1

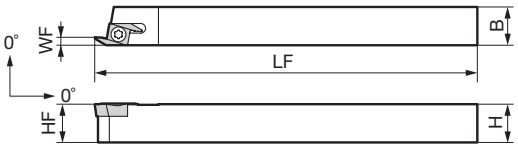
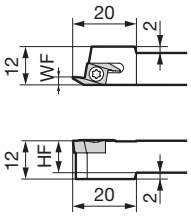


Fig 2



Back Turning
Screw-on

Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Insert	Fig	Flat Insert Screw		Wrench
										N·m	(For Torx hole)
SBT35 R1010	●	10	10	120	2.5	10	BTR35○○	2	BFTX0307N	2.0	TRX10
SBT35 R1212	●	12	12	120	2.5	12		1			
SBT35 R1616	●	16	16	120	2.5	16		1			
SBT35 R2020	●	20	20	125	2.5	20		1			

Back Clamp

PBT
Back Turning

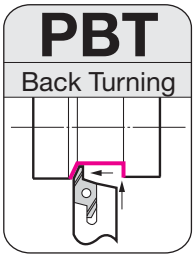


Fig 1

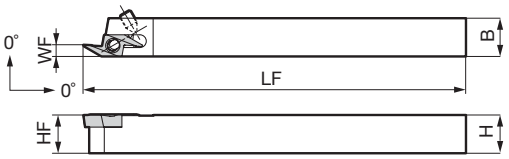
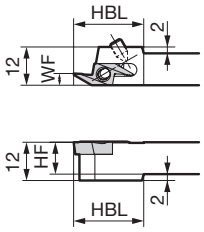


Fig 2



Back Turning
Lever Lock

Holder

Parts

Dimensions (mm)

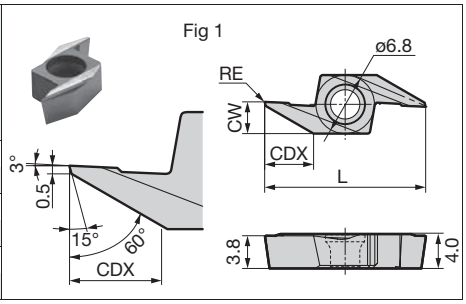
Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset HBL	Applicable Insert	Fig	Lever Pin	Set Screw	Pin	Wrench
													(For Hexagonal hole)
PBT35 R1010	●	10	10	120	2.5	10	20	BTR35○○	2	LCL09	BTT0407	LP07	TH020
PBT35 R1212	●	12	12	120	2.5	12	—		1				
PBT35 R1616	●	16	16	120	2.5	16	—		1		BTT0411		
PBT35 R2020	●	20	20	120	2.5	20	—		1				
PBT55 R1010	●	10	10	120	3.7	10	22	BTR55○○	2	LCL09	BTT0407	LP07	TH020
PBT55 R1212	●	12	12	120	3.7	12	—		1				
PBT55 R1616	●	16	16	120	3.7	16	—		1		BTT0411		
PBT55 R2020	●	20	20	120	3.7	20	—		1				
PBT80 R1010	●	10	10	120	5.2	10	25	BTR80○○	2	LCL09	BTT0407	LP07	TH020
PBT80 R1212	●	12	12	120	5.2	12	—		1				
PBT80 R1616	●	16	16	120	5.2	16	—		1		BTT0411		
PBT80 R2020	●	20	20	120	5.2	20	—		1				

Insert (Coated Carbide / Cermet)

Dimensions (mm)

Cat. No.	AC1030U	AC530U	ACZ150	T1500A	Overall Length L	Maximum Depth of Cut CDX	Width of Cut CW	Corner Radius RE	Applicable Holder	Fig
BT R3505	●	●	●	●	15	3.5	2.5	0.05	SBT35R○○○○	1
BT R3515	●	●	●	●	15	3.5	2.5	0.15	PBT35R○○○○	1
BT R5505	●	●	●	—	19	5.5	3.7	0.05	PBT55R○○○○	1
BT R5515	●	●	●	—	19	5.5	3.7	0.15		1
BT R8005	●	●	●	—	24	8.0	5.2	0.05	PBT80R○○○○	1
BT R8015	●	●	●	—	24	8.0	5.2	0.15		1

Fig 1

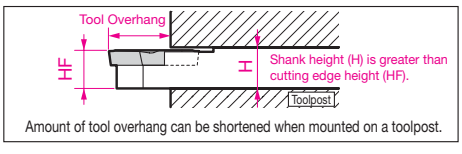


Recommended Cutting Conditions

Work Material	P Free-Cutting Steel		P Carbon Steel		M Stainless Steel	
Tooling	Plunging	Traverse Cut	Plunging	Traverse Cut	Plunging	Traverse Cut
Cutting Speed **vc** (m/min)	50 to 150		50 to 150		50 to 150	
Feed Rate **f** (mm/rev)	0.02 to 0.10	0.02 to 0.15	0.02 to 0.05	0.02 to 0.10	0.02 to 0.04	0.02 to 0.06
Coolant	Wet (oil-based)					

Shank Tolerance of SBT series / PBT series

A positive tolerance (0.1 - 0.3) is applied to the shank height (H) to prevent the cutting edge from interfering with the toolpost.



N·m Recommended Tightening Torque (N·m)

SFT series

General Turning
Screw-on

SFT
External Turning

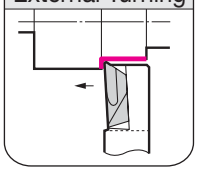
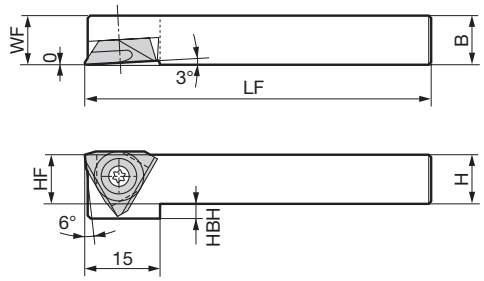


Fig 1



Holder

Parts

Dimensions (mm)

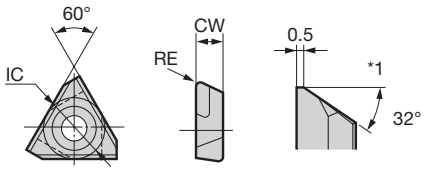
Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset HBH	Applicable Insert	Fig	Flat Insert Screw	Wrench
											(For Torx hole)
SFT R1010	●	10	10	120	10	10	3	TFR33○○	1	BFTX0410NSW	RT08
SFT R1212	●	12	12	120	12	12	1		1		
SFT R1616	●	16	16	120	16	16	—		1		
SFT R2020	●	20	20	120	20	20	—		1		

Insert (Coated Carbide)

Dimensions (mm)

Cat. No.	ACZ150	Inscribed Circle IC	Width of Cut CW	Corner Radius RE	Applicable Holder	Fig
TF R3300	●	9.525	4.76	—	SFT R○○○○	1
TF R3305	●	9.525	4.76	0.05		1
TF R3315	●	9.525	4.76	0.15		1
TF R3320	●	9.525	4.76	0.20		1

Fig 1

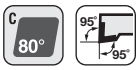


*1: Indicates angle when mounted on the holder
Maximum depth of cut 4.0mm

RS-SCL type

■ Features of Round Shank Holders

- Shank diameters from ø14 to ø25mm are in stock. Holders can be fitted on various manufacturers' sleeve toolposts.
- Bars can be mounted from the rear of the sleeve toolpost to increase the tooling range.



General Turning
Screw-on

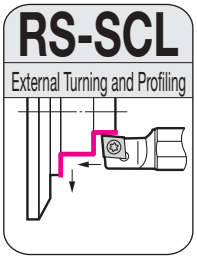
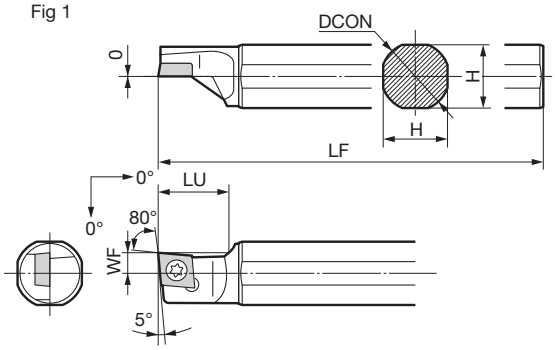


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Usable Length LU	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	Wrench
											(For Torx hole)
RS15H-SCL L06	●	15.875	15	100	6.0	20	CC□□0602	**B70~**	1	BFTX02507NT	RT08
RS19X-SCL L06	●	19.05	18	120	6.0	20			1		
RS20X-SCL L06X	●	20	19	95	6.0	20			1		
RS20X-SCL L06	●	20	19	120	6.0	20			1		
RS22X-SCL L06	●	22	21	120	6.0	20			1		
RS25X-SCL L06	●	25	24	120	6.0	20			1		
RS25M-SCL L06	●	25.4	24	150	6.0	20			1		
RS15H-SCL L09	●	15.875	15	100	6.0	20	CC□□09T3	**B73~**	1	BFTX0408NT	LT25NT
RS19X-SCL L09	●	19.05	18	120	6.0	20			1		
RS20X-SCL L09S	●	20	19	95	6.0	20			1		
RS20X-SCL L09	●	20	19	120	6.0	20			1		
RS22X-SCL L09	●	22	21	120	6.0	20			1		
RS25X-SCL L09	●	25	24	120	6.0	20			1		
RS25M-SCL L09	●	25.4	24	150	6.0	20			1		

Right hand (R) or neutral (N) inserts can be used.

RS-SDU type/RS-SDX type

General Turning
Screw-on

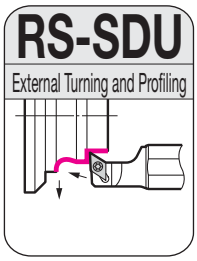
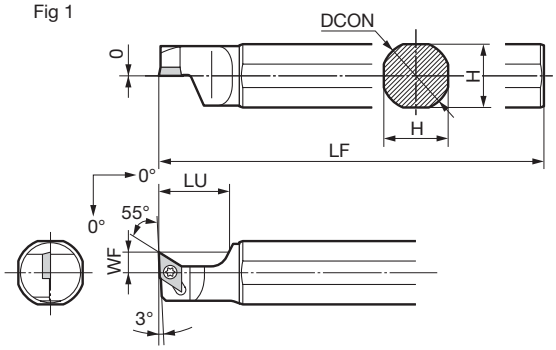


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Usable Length LU	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	Wrench (For Torx hole)
RS14F-SDU L07	●	14	13	80	6.0	20	DC□□0702	**B80~**	1	BFTX02507NT	RT08
RS15H-SDU L07	●	15.875	15	100	6.0	20			1		
RS16F-SDU L07	●	16	15	80	6.0	20			1		
RS16X-SDU L07	●	16	15	120	6.0	20			1		
RS19X-SDU L07	●	19.05	18	120	6.0	20			1		
RS20X-SDU L07S	●	20	19	95	6.0	20			1		
RS20X-SDU L07	●	20	19	120	6.0	20			1		
RS22X-SDU L07	●	22	21	120	6.0	20			1		
RS19X-SDU L11	●	19.05	18	120	10.0	20	DC□□11T3	**B84~**	1	BFTX0410NT	LT25NT
RS20X-SDU L11S	●	20	19	95	10.0	20			1		
RS20X-SDU L11	●	20	19	120	10.0	20			1		
RS22X-SDU L11	●	22	21	120	10.0	20			1		
RS25X-SDU L11	●	25	24	120	10.0	20			1		
RS25M-SDU L11	●	25.4	24	150	10.0	20			1		

Right hand (R) or neutral (N) inserts can be used.

General Turning
Screw-on

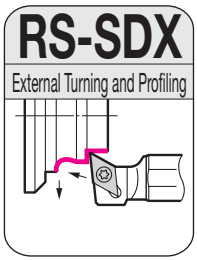
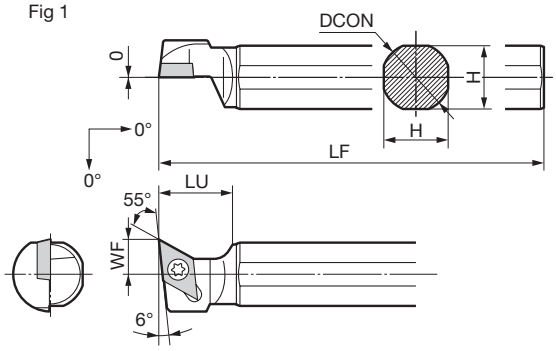


Fig 1



Holder

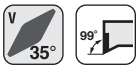
Parts

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Usable Length LU	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	Wrench (For Torx hole)
RS19X-SDX L11	●	19.05	18	120	10.0	20	DC□□11T3	**B84~**	1	BFTX0410NT	LT25NT
RS20X-SDX L11S	●	20	19	95	10.0	20			1		
RS20X-SDX L11	●	20	19	120	10.0	20			1		
RS25X-SDX L11	●	25	24	120	10.0	20			1		

Right hand (R) or neutral (N) inserts can be used.

RS-SVX type/RS-SVVP type



General Turning
Screw-on

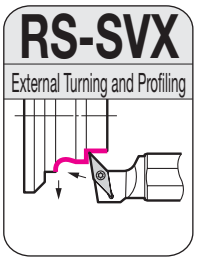
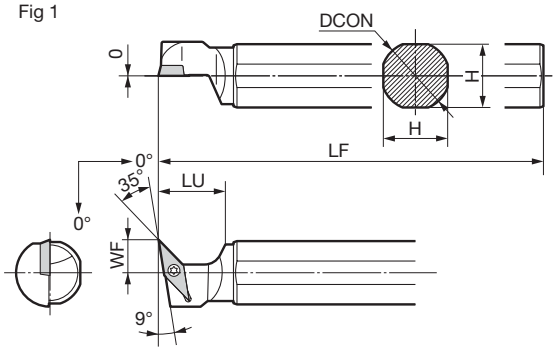


Fig 1



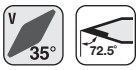
Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Usable Length LU	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	Wrench (For Torx hole)
RS15H-SVX L11	●	15.875	15	100	10.0	20	VC□□1103	**B121~**	1	BFTX02507NT	RT08
RS19X-SVX L11	●	19.05	18	120	10.0	20			1		
RS20X-SVX L11S	●	20	19	95	10.0	20			1		
RS20X-SVX L11	●	20	19	120	10.0	20			1		
RS22X-SVX L11	●	22	21	120	10.0	20			1		
RS25X-SVX L11	●	25.4	24	150	10.0	20			1		

Right hand (R) or neutral (N) inserts can be used.



General Turning
Screw-on

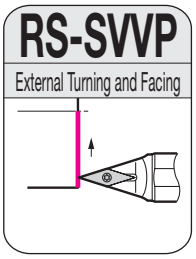
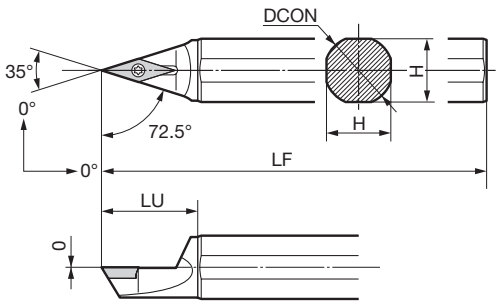


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Usable Length LU	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	Wrench (For Torx hole)
RS19X-SVVP N11	●	19.05	18	120	27	VP□□1103	**B125**	1	BFTX02507NT	RT08
RS22X-SVVP N11	●	22	21	120	27			1		

RS-PTXN type

General Turning
Lever Lock

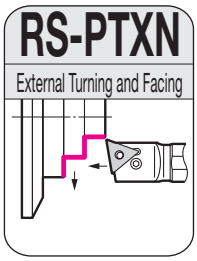
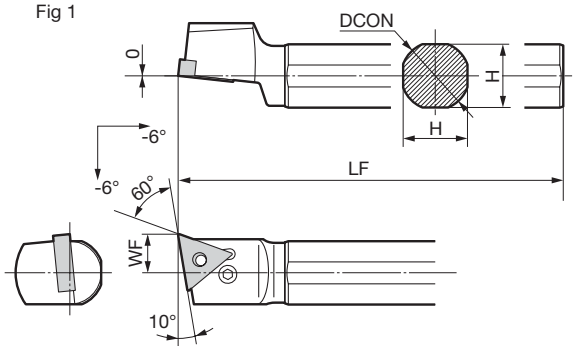


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Applicable Insert		Fig	Lever Pin	Bolt	Wrench
						Cat. No.	Ref. Page				(For Hexagonal hole)
RS19X-PTXN L16	●	19.05	18	120	11.0	TN□□1604	**B50~**	1	LCL33NT	LCS33NT	LH020NT
RS20X-PTXN L16	●	20	19	120	11.0			1			
RS25M-PTXN L16	●	25.4	24	150	13.0			1			

Right hand (R) or neutral (N) inserts can be used.

Zero Offset Holders

Zero Offset | Back Clamp | 80° | 95°

PCLC-X

External Turning and Facing

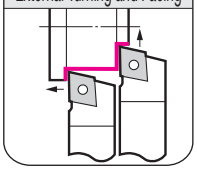
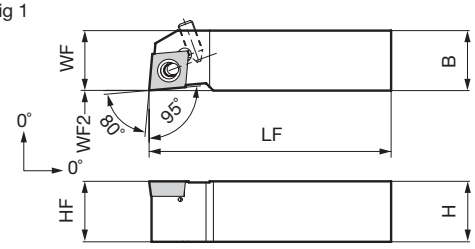


Fig 1



For PCLC R/L1212-K09X

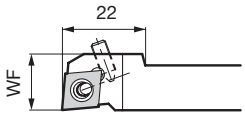


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset WF2	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Set Screw	Pin	Wrench (For Hexagonal hole)
PCLC R/L1010-K06X	●		10	10	125	10	10	0	CC□T0602	**B70~**	1	LCL06	BTT0407	LP07	TH020
PCLC R/L1212-K09X	●		12	12	125	15	12	0	CC□T09T3	**B73~**	1	LCL09	BTT0411	LP06	TH020
PCLC R/L1616-K09X	●		16	16	125	16	16	0			1				

Zero Offset | 80° | 95°

SCLC-X

External Turning and Facing

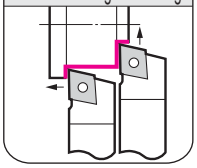


Fig 1

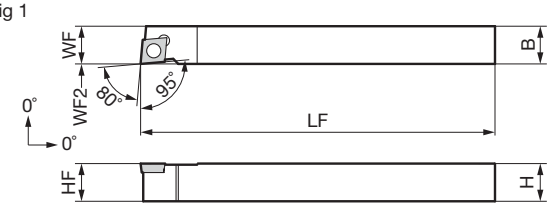


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset WF2	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SCLC R/L1010-H06X	●	●	10	10	100	10	10	0	CC□T0602	**B70~**	1	BFTX02506N	**1.5**	TRX08
SCLC R/L1215-K09X	●	●	12	15	125	15	12	0	CC□T09T3	**B73~**	1	BFTX0409N	**3.4**	TRX15
SCLC R/L1215-F09X*	●	●	12	15	85	15	12	0			1			

*85mm Shank

Zero Offset | 80° | 91°

SCAC-X

External Turning

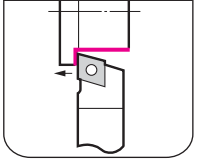


Fig 1

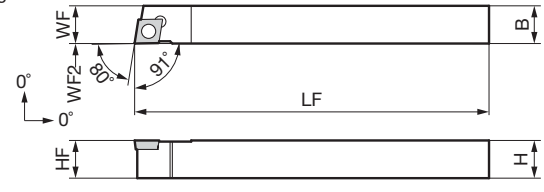


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset WF2	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SCAC R/L1010-H06X	●	●	10	10	100	10	10	0	CC□T0602	**B70~**	1	BFTX02506N	**1.5**	TRX08
SCAC R/L1215-F09X*	●	●	12	15	85	15	12	0	CC□T09T3	**B73~**	1	BFTX0409N	**3.4**	TRX15
SCAC R/L1215-K09X	●	●	12	15	125	15	12	0			1			

*85mm Shank

N·m Recommended Tightening Torque (N·m)

Zero Offset Holders

Zero Offset | Back Clamp | D 55° | 93°

PDJC-X

External Turning and Profiling

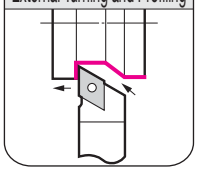
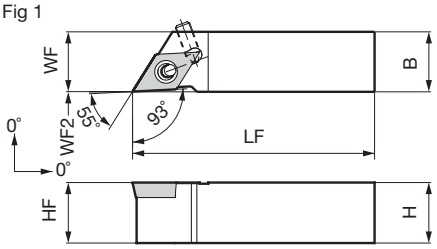


Fig 1



For PDJC R/L1212-K11X

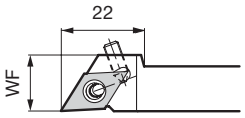


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset WF2	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Set Screw	Pin	Wrench (For Hexagonal hole)
PDJC R/L1010-K07X	●		10	10	125	10	10	0	DC□T0702	**B80~**	1	LCL06	BTT0407	LP04	TH020
PDJC R/L1212-K11X	●		12	12	125	15	12	0	DC□T11T3	**B84~**	1	LCL09	BTT0411	LP07	TH020
PDJC R/L1616-K11X	●		16	16	125	16	16	0			1				

Zero Offset | D 55° | 93°

SDJC-X

External Turning and Profiling

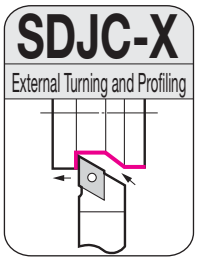


Fig 1

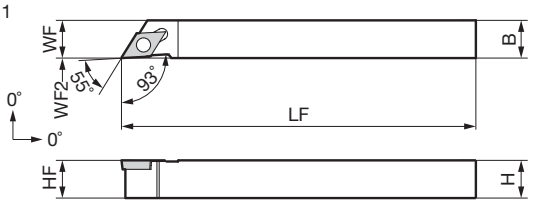


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset WF2	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDJC R/L1010-H07X	●	●	10	10	100	10	10	0	DC□T0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
SDJC R/L1215-F11X*	●	●	12	15	85	15	12	0	DC□T11T3	**B84~**	1	BFTX0409N	**3.4**	TRX15
SDJC R/L1215-K11X	●	●	12	15	125	15	12	0			1			

*85mm Shank

N·m Recommended Tightening Torque (N·m)

Zero Offset Holders

Zero Offset | D 55° | 91°

SDAC-X
External Turning and Profiling

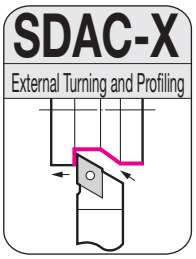


Fig 1

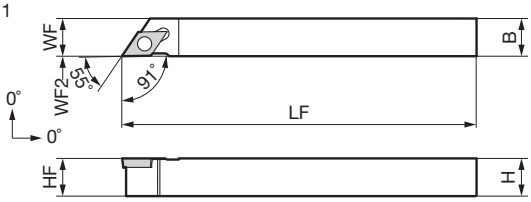


Figure shows right-handed (R) tool.

Holder / Parts — Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset WF2	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDAC R/L1010-H07X	●	●	10	10	100	10	10	0	DC□T0702	**B80~**	1	BFTX02506N	1.5	TRX08
SDAC R/L1215-F11X*	●	●	12	15	85	15	12	0	DC□T11T3	**B84~**	1	BFTX0409N	3.4	TRX15
SDAC R/L1215-K11X	●	●	12	15	125	15	12	0			1			

*85mm Shank

Zero Offset | D 55° | 107.5°

SDPC-X
Necking

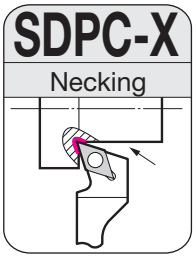


Fig 1

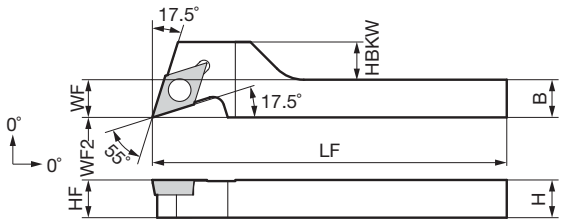


Figure shows right-handed (R) tool.

Holder / Parts — Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Step HBKW	Offset WF2	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDPC R/L1010-H11X	●	●	10	10	100	10	10	10	0	DC□T11T3	**B84~**	1	BFTX0409N	3.4	TRX15

N·m Recommended Tightening Torque (N·m)

Zero Offset Holders

Zero Offset | V 35° | 93°

SVJC-X

General Turning and Profiling

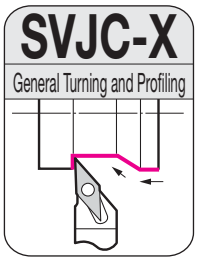


Fig 1

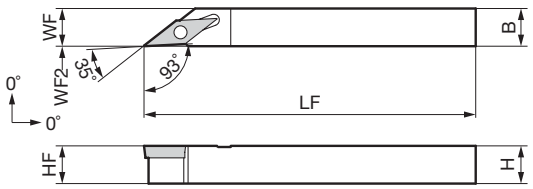


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Offset WF2	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SVJC R/L1010-H11X	●	●	10	10	100	10	10	0	VC□T1103	**B121~**	1	BFTX02508NV	**1.5**	TRX08
SVJC R/L1212-F11X*	●	●	12	12	85	12	12	0			1			
SVJC R/L1212-K11X	●	●	12	12	125	12	12	0			1			

*85mm Shank

Zero Offset | T 60° | 100°

PTXN-X

External Turning and Facing

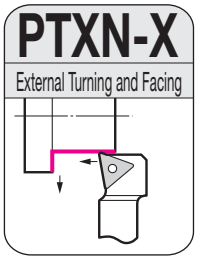
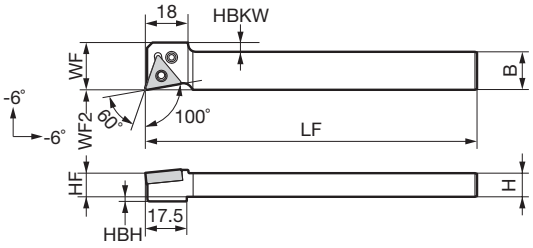


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Step HBH	Step HBKW	Offset WF2	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Lever Pin	Bolt	Wrench (For Hexagonal hole)
PTXN R1016-X16X	●	10	16	120	20	10	2	4	0	TN□□1604	**B50~**	1	LCL33NT	LCS33NT	LH020NT
PTXN R1216-X16X	●	12	16	120	20	12	0	4	0			1			
PTXN R1616-X16X	●	16	16	120	20	16	0	4	0			1			
PTXN R2020-X16X	●	20	20	120	20	20	0	0	0			1			

N·m Recommended Tightening Torque (N·m)

M E M O

PC series/SC series

Back Clamp | C 80° | 95° 95°

General External Turning
Lever Lock

PCLC

External Turning and Facing

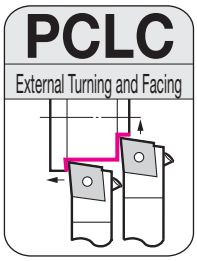
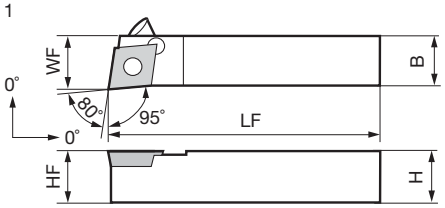


Fig 1



For PCLC R/L0810-K06

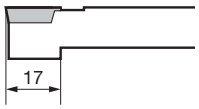


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Set Screw	Pin	Wrench (For Hexagonal hole)
PCLC R/L0810-K06	●	●	8	10	125	10.5	8	CC□□0602	**B70~**	1	LCL06	BTT0407	LP07	TH020
PCLC R/L1010-K06	●	●	10	10	125	10.5	10			1				
PCLC R/L1212-M09	●	●	12	12	150	12.5	12	CC□□09T3	**B73~**	1	LCL09	BTT0407	LP06	TH020
PCLC R/L1616-M09	●	●	16	16	150	16.5	16			1		BTT0411		
PCLC R/L2020-M09	●	●	20	20	150	20.5	20			1				

C 80° | 95° 95°

General External Turning
Screw-on

SCLC

External Turning and Facing

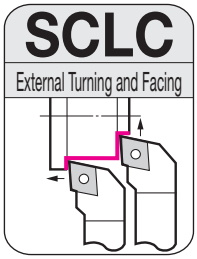


Fig 1

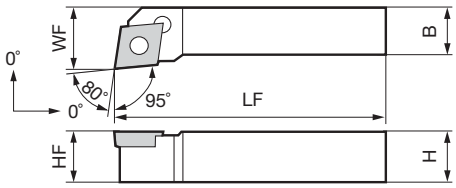


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
SCLC R/L0808H06	SCLC R/L0808-06	●	●	8	8	100	10	8	CC□□0602	**B70~**	1	BFTX02506N	**1.5**	TRX08
SCLC R/L1010H06	SCLC R/L1010-06	●	●	10	10	100	12	10			1			
SCLC R/L1212H09	SCLC R/L1212-09	●	●	12	12	100	16	12	CC□□09T3	**B73~**	1	BFTX0409N	**3.4**	TRX15
SCLC R/L1616H09	SCLC R/L1616-09	●	●	16	16	100	20	16			1			
SCLC R/L2020K09	SCLC R/L2020-09	●	●	20	20	125	25	20			1			

When using handed breaker inserts for facing, the holder and insert are opposite handed.

Note: The values in red (cutting edge WF) have been changed from those in the 2021-2022 General Catalogue.

N·m Recommended Tightening Torque (N·m)

General External Turning
Screw-on

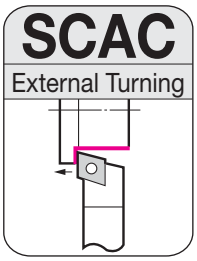


Fig 1

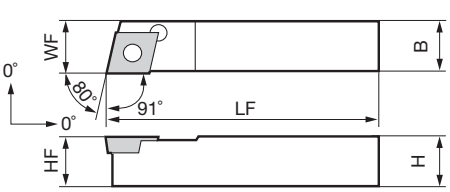


Figure shows right-handed (R) tool.

Holder

Parts

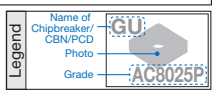
Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SCAC R/L0808-06	●		8	8	100	8.5	8	CC□□0602	**B70~**	1	BFTX02506N	**1.5**	TRX08
SCAC R/L1010-06	●	●	10	10	100	10.5	10			1			
SCAC R/L1212-09	●	●	12	12	100	12.5	12	CC□□09T3	**B73~**	1	BFTX0409N	**3.4**	TRX15
SCAC R/L1616-09	●	●	16	16	100	16.5	16			1			
SCAC R/L2020-09	●	●	20	20	125	20.5	20			1			

Applicable Inserts ◀·· PCLC type/SCLC type/SCAC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	FB **T1500Z**	GU **AC8025P**	MU **AC8025P**	LB **AC6030M**	GU **AC6030M**	MU **AC6040M**	SUMIBORON BN7125/BNC500	MU **AC4015K**	No Chipbreaker **AC4015K**	SU **AC5015S**	SUMIDIA **DA1000**	AG **H1**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**	SUMIDIA **DA90**
High-precision	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	SUMIBORON BN7125/BNC500	—	—	SI **AC5015S**	SUMIDIA **DA1000**	—	SUMIBORON **BNC2115**	SUMIBORON **BN1000**	SUMIDIA BINDERLESS **NPD10**
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~	☞ A22~		☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

PD series/SD series

Back Clamp | D 55° | 93°

General External Turning and Profiling
Lever Lock

PDJC

External Turning and Profiling

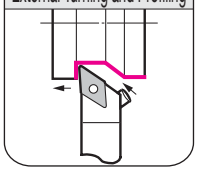
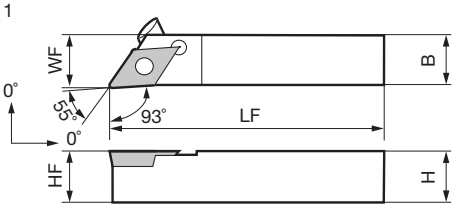


Fig 1



For PDJC R/L0810-K07

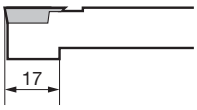


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Set Screw	Pin	Wrench (For Hexagonal hole)
PDJC R/L0810-K07	●	●	8	10	125	10.5	8	DC□□0702	**B80~**	1	LCL06	BTT0407	LP04	TH020
PDJC R/L1010-K07	●	●	10	10	125	10.5	10			1				
PDJC R/L1212-M11	●	●	12	12	150	12.5	12	DC□□11T3	**B84~**	1	LCL09	BTT0407	LP07	TH020
PDJC R/L1616-M11	●	●	16	16	150	16.5	16			1		BTT0411		
PDJC R/L2020-M11	●	●	20	20	150	20.5	20			1				

D 55° | 93°

General External Turning and Profiling
Screw-on

SDJC

External Turning and Profiling

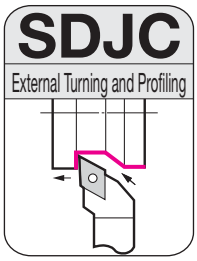


Fig 1

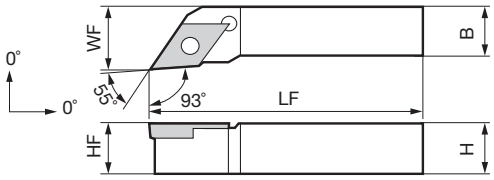


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDJC R/L0808H07	SDJC R/L0808-07	●		8	8	100	10	8	DC□□0702	**B80~**	1	BFTX02506N	1.5	TRX08
SDJC R/L1010H07	SDJC R/L1010-07	●	●	10	10	100	12	10			1			
SDJC R/L1212H11	SDJC R/L1212-11	●	●	12	12	100	16	12	DC□□11T3	**B84~**	1	BFTX0409N	3.4	TRX15
SDJC R/L1616H11	SDJC R/L1616-11	●	●	16	16	100	20	16			1			
SDJC R/L2020K11	SDJC R/L2020-11	●	●	20	20	125	24	20			1			

N·m Recommended Tightening Torque (N·m)

General External Turning and Profiling
Screw-on

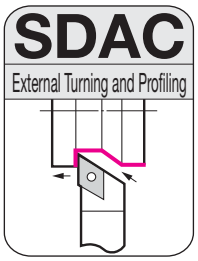


Fig 1

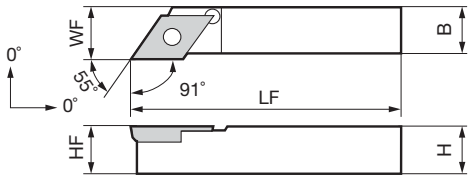


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDAC R/L0808-07	●	●	8	8	100	8.5	8	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
SDAC R/L1010-07	●	●	10	10	100	10.5	10			1			
SDAC R/L1212-11	●	●	12	12	100	12.5	12	DC□□11T3	**B84~**	1	BFTX0409N	**3.4**	TRX15
SDAC R/L1616-11	●	●	16	16	100	16.5	16			1			
SDAC R/L2020-11	●	●	20	20	125	20.5	20			1			

General External Turning and Profiling
Screw-on

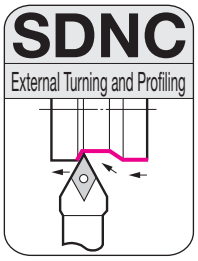
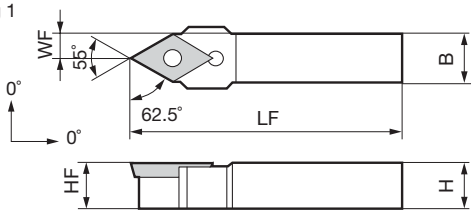
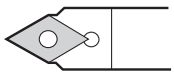


Fig 1



For SDNC N1616
SDNC N2020



Holder

Parts

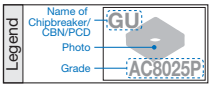
Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDNC N0808-07		8	8	100	4	8	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
SDNC N1010-07	●	10	10	100	5	10			1			
SDNC N1212-11	●	12	12	100	6	12	DC□□11T3	**B84~**	1	BFTX0409N	**3.4**	TRX15
SDNC N1616-11	●	16	16	100	8	16			1			
SDNC N2020-11	●	20	20	125	10	20			1			

Applicable Inserts ◂·· PDJC type/SDJC type/SDAC type/SDNC type

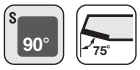
1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6030M	SUMIBORON BN7125/BNC500	MU AC4015K	No Chipbreaker AC4015K	FX AC5015S	SUMIDIA DA1000	AG H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FF AC1030U	SI AC1030U	SC AC1030U	FF AC1030U	SI AC1030U	SC AC1030U	SUMIBORON BN7125/BNC500	—	—	SI AC5015S	SUMIDIA DA1000	—	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~	☞ A22~		☞ A20~		☞ M2~

BNC500 is for ductile cast iron.



General External Turning
Screw-on

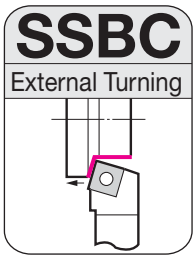


Fig 1

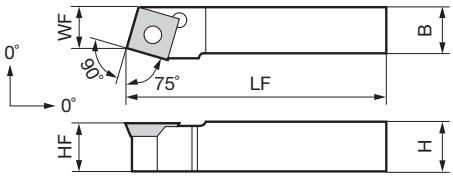


Figure shows right-handed (R) tool.

Holder

Parts

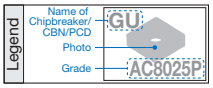
Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SSBC R/L1010-07	●	●	10	10	100	9	10	SC□□0702	**B90**	1	BFTX0307N	**2.0**	TRX10
SSBC R/L1212-09	●	●	12	12	100	11	12	SC□□09T3	**B91**	1	BFTX0409N	**3.4**	TRX15
SSBC R/L1616-09	●	●	16	16	100	15	16			1			
SSBC R/L2020-09	●	●	20	20	125	19	20			1			

Applicable Inserts ◀·· SSBC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	N (Non-Ferrous)
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6040M	MU AC4015K	No Chipbreaker AC4015K	SUMIDIA DA1000
High-precision	FX T1500A	SC AC1030U	SC AC1030U	FX AC1030U	SC AC1030U	SC AC1030U	—	—	SUMIDIA DA1000
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~		☞ A22~

N·m Recommended Tightening Torque (N·m)

T 60° 91°

General External Turning
Screw-on

STGC
External Turning

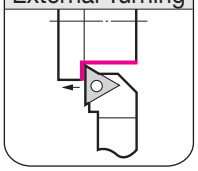


Fig 1

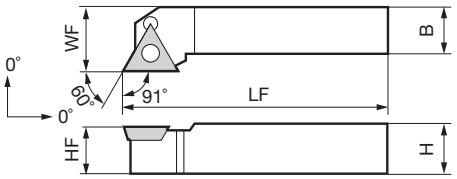


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
STGC R/L0808-09	●		8	8	100	10	8	TC□□0902	**B102**	1	BFTX02205N	**0.5**	TRX06
STGC R/L1010-09	●	●	10	10	100	12	10			1			
STGC R/L1212-11	●	●	12	12	100	16	12	TC□□1102	**B103**	1	BFTX02506N	**1.5**	TRX08
STGC R/L1616-11	●	●	16	16	100	20	16			1			
STGC R/L2020-11	●	●	20	20	125	25	20			1			

T 60° 91°

General External Turning
Screw-on

STAC
External Turning

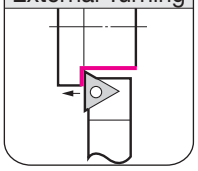


Fig 1

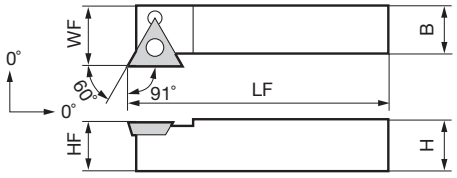


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
STAC R/L0808-09		●	8	8	100	8.5	8	TC□□0902	**B102**	1	BFTX02205N	**0.5**	TRX06
STAC R/L1010-09	●		10	10	100	10.5	10			1			
STAC R/L1212-11	●	●	12	12	100	12.5	12	TC□□1102	**B103**	1	BFTX02506N	**1.5**	TRX08
STAC R/L1616-11	●	●	16	16	100	16.5	16			1			
STAC R/L2020-11	●	●	20	20	125	20.5	20			1			

Applicable Inserts ◀·· STGC type/STAC type

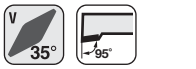
1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD — GU; Photo; Grade — AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	N (Non-Ferrous) —
General Machining	LU **T1500Z**	SU **AC8025P**	SU **AC8025P**	LB **AC6030M**	SU **AC6030M**	SU **AC6040M**	MU **AC4015K**	No Chipbreaker **AC4015K**	SUMIDIA **DA1000**
High-precision	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	—	—	SUMIDIA **DA1000**
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~		☞ A22~

SV series (7° Pos.)



General External Turning and Profiling
Screw-on

SVLC

External Turning and Profiling

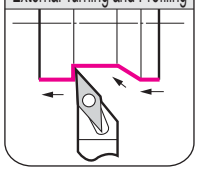


Fig 1

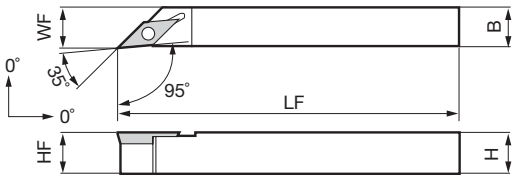


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SVLC R/L1010-H11	●	●	10	10	100	10.5	10	VC□□1103	**B121~**	1	BFTX02508NV	**1.5**	TRX08
SVLC R/L1212-H11	●	●	12	12	100	12.5	12			1			
SVLC R/L1616-H11	●	●	16	16	100	16.5	16			1			
SVLC R/L2020-K11*	●	●	20	20	125	20.5	20			1			

* Old Cat. No. SVLC R/L 2020-H11

General External Turning and Profiling
Screw-on

SVPC

Necking

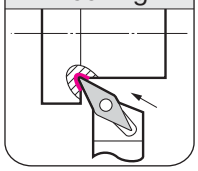


Fig 1

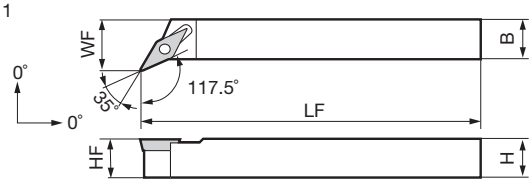


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

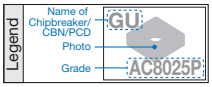
Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SVPC R/L1010-H11	●	●	10	10	100	14.5	10	VC□□1103	**B121~**	1	BFTX02508NV	**1.5**	TRX08
SVPC R/L1212-H11	●	●	12	12	100	16.5	12			1			
SVPC R/L1616-H11	●	●	16	16	100	20.5	16			1			
SVPC R/L2020-K11*	●	●	20	20	125	24.5	20			1			

* Old Cat. No. SVPC R/L 2020-H11

Applicable Inserts ◂·· SVLC type/SVPC type

1st Recommended Insert

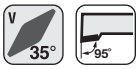
- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application / Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	**FB** **T1500Z**	**GU** **AC8025P**	**LB** **AC6030M**	**GU** **AC6030M**	**SU** **AC5015S**	**SU** **AC5025S**	**SUMIDIA** **DA1000**	**AG** **H1**	**SUMIBORON** **BNC2125**	**SUMIBORON** **BN2000**	**SUMIDIA** **DA90**
High-precision	**FF** **AC1030U**	**SI** **AC1030U**	**FF** **AC1030U**	**SI** **AC1030U**	**FF** **AC1030U**	**SI** **AC5015S**	**SUMIDIA** **DA1000**	—	**SUMIBORON** **BNC2115**	**SUMIBORON** **BN1000**	**SUMIDIA BINDERLESS** **NPD10**
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A18~		☞ A22~		☞ A20~		☞ M2~

N·m Recommended Tightening Torque (N·m)

SV series (11° Pos.)



General External Turning and Profiling
Screw-on

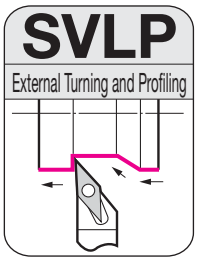


Fig 1

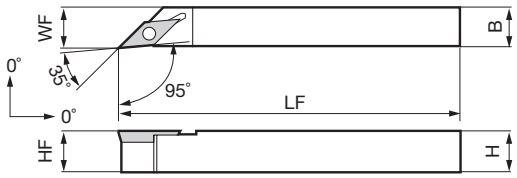


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SVLP R/L1010-H11	●	●	10	10	100	10.5	10	VP□T1103	**B125**	1	BFTX02508NV	**1.5**	TRX08
SVLP R/L1212-H11	●	●	12	12	100	12.5	12			1			
SVLP R/L1616-H11	●	●	16	16	100	16.5	16			1			

General External Turning and Profiling
Screw-on

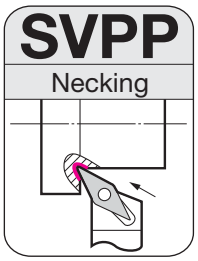


Fig 1

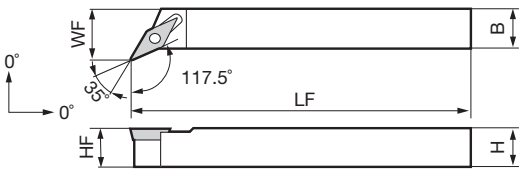


Figure shows right-handed (R) tool.

Holder

Parts

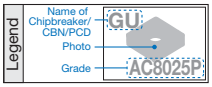
Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SVPP R/L1010-H11	●	●	10	10	100	14.5	10	VP□T1103	**B125**	1	BFTX02508NV	**1.5**	TRX08
SVPP R/L1212-H11	●	●	12	12	100	16.5	12			1			
SVPP R/L1616-H11	●	●	16	16	100	20.5	16			1			

Applicable Inserts ◀·· SVLP type/SVPP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Process \ Application Range	P (Steel) Finishing	M (Stainless Steel) Finishing
High-precision	FX **AC1030U**	FX **AC1030U**
Recommended Cutting Conditions	☞ A24~	☞ A24~

Boring Bars E

E1 to E82

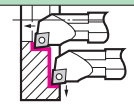
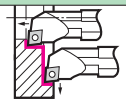
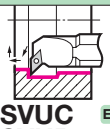
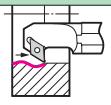
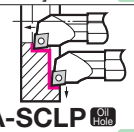
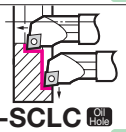
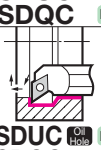
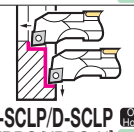
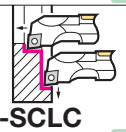
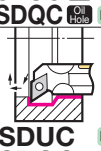
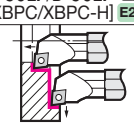
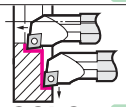
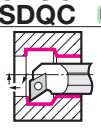
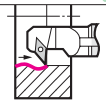
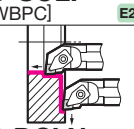
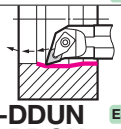
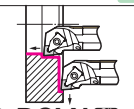
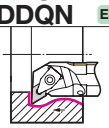
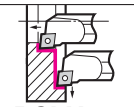
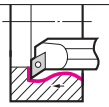
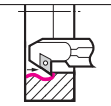
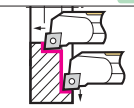
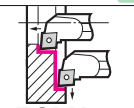
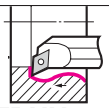
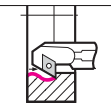
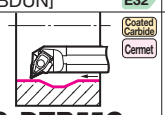
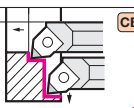
		Selection Guide for Boring Bars by Tooling E2
		Boring Bars Identification Table E4
		Selection Guide for Boring Bars E5
		Boring Bar series E8
		Smart Damper™ for Internal Boring E10
		Twin Head Holders for Multi-functional Small Lathe Tools E16
Bottom Facing	SEC-Boring Bar	S-SCLC type / A-SCLC type E18
		B-SCLC type E19
		C-SCLC type / E-SCLC type E20
		S-SCLP type / A-SCLP type E21
		B-SCLP type / D-SCLP type / C-SCLP type E22
		S-DCLN type / D-DCLN type E23
		S-PCLN type / B-PCLN type E24
		S-ECLN type E25
Profiling	SEC-Boring Bar	S-SDUC type / A-SDUC type E26
		B-SDUC type / C-SDUC type E27
		S-SDQC type / A-SDQC type E28
		B-SDQC type E29
		S-SDZC type E30
		S-DDQN type / S-DDUN type E31
		D-DDUN type / S-PDUN type / S-EDUN type E32
		S-PDZN type / S-EDZN type E33
		S-DTR55C type E34
Through Boring	SEC-Boring Bar	S-SSKP type / C-SSKP type E36
		S-CSKP type E37
		S-SSKC type E38
		S-DSKN type / S-PSKN type E39
		S-ESKN type / S-PSYN type E40
		S-ESYN type E41
Stop Boring	SEC-Boring Bar	S-STUB type / S-STUP type / A-STUP type E42
		B-STUP type E43
		D-STUP type / C-STUB type / C-STUP type E44
		E-STUP type E45
		S-CTFP type E46
		S-DTFN type / D-DTFN type E47
		S-PTFN type / B-PTFN type E48
		S-ETFN type E49
Profiling	SEC-Boring Bar	S-SVJB type / B-SVJB type E50
		S-SVJC type E51
		S-SVQB type / B-SVQB type E52
		C-SVQB type E53
		S-SVQC type / A-SVQC type E54
		S-SVUB type / B-SVUB type E55
		C-SVUB type E56
		S-SVUC type / A-SVUC type E57
		S-SVZB type / B-SVZB type E58
		C-SVZB type E59
		S-SVZC type E60
	Tool Holders for Aluminum Wheel Turning	MV type / GD type ..... (C45, C46, C47)
Stop Boring	SEC-Boring Bar	S-SWUB type / C-SWUB type E62
		S-SWUP type E63
		S-DWLN type / D-DWLN type E64
		S-PWLN type E65
SumiSmall Very Small Diameter Turning Small Diameter Turning	SEC-MINI Boring Bars	CKB series E66
	Solid Carbide Bar	Expansion BXBR series E72
	Small Diameter Boring Bars	BSME series E75
		Expansion SEXC series E76
	SUMIBORON Small Hole Boring Bars	Expansion BNBX series E78
		Expansion BNZ series E79
		Expansion BNB series E80
	SUMIDIA Small Diameter Boring Bars	DABB series E81
	Double Clamp Tool Holders	Clamp Set Parts E82

Stock Markings and Symbols

●● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

Boring Bar series

Selection Guide by Tooling

Applications		Bottom Facing		Profiling			Back Turning	
Insert Shape	Structure/Shank Material	80° Diamond type C		55° Diamond type D	35° Diamond type V		55° Diamond type D	35° Diamond type V
Screw-on	Steel	 S-SCLP [BBPC] E21	 S-SCLC E18	S-SDUC E26 S-SDQC E28	 S-SVUC E57 S-SVUB E55	S-SVQC E54 S-SVQB E52	 S-SDZC E30	S-SVZC E60 S-SVZB E58
		 A-SCLP Oil Hole E21	 A-SCLC Oil Hole E18	 A-SDUC Oil Hole E26 A-SDQC Oil Hole E28	A-SVUC Oil Hole E57 A-SVQC Oil Hole E54	—	—	—
	Steel with Anti-Vibration Mechanism	 B-SCLP/D-SCLP Oil Hole [XBPC/XBPC-H] E22	 B-SCLC E19	 B-SDUC E27 B-SDQC E29	B-SVUB E55 B-SVQB E52	—	—	B-SVZB E58
	Carbide	 C-SCLP [WBPC] E22	 C-SCLC E20 E-SCLC Oil Hole E20	 C-SDUC E27	C-SVUB E56 C-SVQB E53	—	—	 C-SVZB E59
Double Clamp	Steel	 S-DCLN E23	—	 S-DDUN E31 S-DDQN E31	—	—	—	—
	Steel with Anti-Vibration Mechanism	 D-DCLN Oil Hole E23	—	 D-DDUN Oil Hole E32	—	—	—	—
Clamp-on	Steel	—	—	—	—	—	—	—
Lever Lock	Steel	 S-PCLN E24	—	 S-PDUN E32	—	—	 S-PDZN E33	—
	Steel with Anti-Vibration Mechanism	 B-PCLN E24	—	—	—	—	—	—
Pin Lock	Steel	 S-ECLN [BCLN] E25	—	 S-EDUN [BDUN] E32	—	—	 S-EDZN [BDZN] E33	—
Special Double Clamp	T-REX Tool Holders	—	—	 Coated Carbide Cermet S-DTR55C SumiTurn T-REX E34	—	—	—	—
CBN	Carbide	 CBN BNZ Expansion E79	—	—	—	—	—	—

Inside [ ] shows previous product series Oil Hole: With oil hole Coated Carbide Cermet CBN: Lineup of dedicated insert grades (includes solid/brazed)

Boring Bar series

Selection Guide by Tooling

Structure/Shank Material	Insert Shape	Spherical Internal Facing	Through Boring		Stop Boring			
		35° Diamond type V	Trigon type W / Others	Square type S	Trigon type W	Triangular type T	Others	
Screw-on	Steel	S-SVJB E50 S-SVJC E51	S-SWUB[BBPW] E62 S-SWUP E63	S-SSKP[BBPS] E36 S-SSKC E38	S-SWUB[BBPW] E62 S-SWUP E63	S-STUP/S-STUB [BBPT] E42	—	—
		—	—	—	—	A-STUP Oil Hole E42	—	—
	Steel with Anti-Vibration Mechanism	B-SVJB E50	—	—	—	B-STUP[XBPT] Oil Hole E43 D-STUP[XBPT-H] E44	—	—
	Carbide	—	C-SWUB [WBPW] E62	C-SSKP [WBPS] E36	C-SWUB [WBPW] E62	C-STUP/C-STUB [WBPT] E44 E-STUP Oil Hole [WBPT-H] E45	SEXC Oil Hole Coated Carbide Cermet CBN Expansion E74	—
Double Clamp	Steel	—	—	S-DSKN E39	S-DWLN E64	S-DTFN E47	—	—
	Steel with Anti-Vibration Mechanism	—	—	—	D-DWLN Oil Hole E64	D-DTFN Oil Hole E47	—	—
Clamp-on	Steel	—	—	S-CSKP E37	—	S-CTFP E46	CKB Coated Carbide PCD E66	—
Lever Lock	Steel	—	—	S-PSKN E39 S-PSYN E40	S-PWLN E65	S-PTFN E48	—	—
	Steel with Anti-Vibration Mechanism	—	—	—	—	B-PTFN E48	—	—
Pin Lock	Steel	—	—	S-ESKN[BSKN] E40 S-ESYN[BSYN] E41	—	S-ETFN [BTFN] E49	—	—
Solid	Carbide	—	—	—	—	—	BXBR Coated Carbide Expansion E72	—
CBN/PCD	Carbide	—	—	—	—	BNB CBN PCD Expansion E80	BSME Oil Hole CBN E75	BNBX CBN Expansion E78

Inside [ ] shows previous product series Oil Hole: With oil hole Coated Carbide Cermet CBN PCD: Lineup of dedicated insert grades (includes solid/brazed)

Boring Bars Identification Table

■ Catalogue Classification System for SEC-Boring Bars (Round Shank) [ISO Standard]

Example: **S 16 R — S T U P R 11 03 - 18**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Shank Material Refer to Table 1	(2) Shank Diameter mm	(3) Shank Length Refer to Table 3	(4) Structural Symbol Refer to Table 4	(5) Insert Shape Refer to Table 5	(6) Holder Style Refer to Table 6	(7) Insert Relief Angle Refer to Table 7	(8) Feed Direction Refer to Table 8	(9) Insert Cutting Edge Length mm	*(10) Insert Thickness mm	*(11) Min. Bore Diameter mm

* This code may only be included in some of the catalogue nos.

Table 1

(1) Shank Material	
Symbol	Shank Material
S	Steel Shank
A	Steel Shank with Oil Hole
B	Steel Shank with Anti-Vibration Mechanism
D	Steel Shank with Anti-Vibration Mechanism and Oil Hole
C	Carbide Shank
E	Carbide Shank with Oil Hole

Table 3

(3) Shank Length					
Symbol	Length (mm)	Symbol	Length (mm)	Symbol	Length (mm)
F	80	M	150	T	300
G	90	N	160	U	350
H	100	P	170	V	400
J	110	Q	180	W	450
K	125	R	200		
L	140	S	250		

Table 4

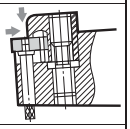
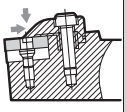
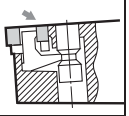
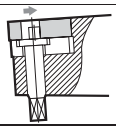
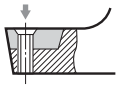
(4) Structural Symbol					
Symbol	Clamp	Structure	Symbol	Clamp	Structure
C	Clamp-on		M	Clamp-on + Pin Lock	
D	Double Clamp		P	Lever Lock (insert supported by 2 faces)	
E	Pin Lock (insert supported by 1 face)		S	Screw-on	

Table 8

(8) Feed Direction			
Symbol	Right Hand	Symbol	Left Hand
R		L	

Table 5

(5) Insert Shape			
Symbol	Insert Shape	Symbol	Insert Shape
A	85° Apex Angle Parallelogram	M	86° Apex Angle Diamond type
B	82° Apex Angle Parallelogram	O	Octagonal type
C	80° Apex Angle Diamond type	P	Pentagonal type
D	55° Apex Angle Diamond type	R	Round type
E	75° Apex Angle Diamond type	S	Square type
F	50° Apex Angle Diamond type	T	Triangular type
H	Hexagonal type	V	35° Apex Angle Diamond type
K	55° Apex Angle Parallelogram	W	Trigon type
L	Rectangular type		

Table 6

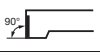
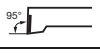
(6) Holder Style (— indicates main cutting edge)					
Symbol	Shape	Offset	Symbol	Shape	Offset
A		No	N		No
B		No	Q		Yes
D		No	R		Yes
E		No	S		Yes
F		Yes	T		Yes
G		Yes	U		Yes
J		Yes	W		Yes
K		Yes	Y		Yes
L		Yes	Z		Yes

Table 7

(7) Insert Relief Angle	
Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Special Relief Angle

■ Catalogue Classification System for SEC-Boring Bars (Round Shank) [Sumitomo Standard]

Example: **WB P T — 2 12 R (H) (14)**

BB	Steel Shank Boring Bar
WB	Carbide Shank Boring Bar
XB	Steel Shank Boring Bar with Anti-Vibration Mechanism

P	Positive Insert

Symbol	T	S	C
Insert Shape	Triangular type	Square type	80° Diamond type

Symbol	R	L
Direction	Right	Left

Symbol	08	10	12	16	20	25
Shank Diameter (mm)	8	10	12	16	20	25

Symbol	5	6	2	0	3	4
Insert Inscribed Circle (mm)	3.97	4.76	6.35	7.94	9.525	12.70

With Oil Hole

Min. Bore Dia.

Selection Guide for Boring Bars

Guide for Selection by Application

Applications	Tool Type	Shank Material Boring Depth (L/D) Steel	Carbide	Anti-Vibration	Applicable Inserts and Shapes	Tooling	Min. Bore Dia. (mm) *The actual values will be written in the table if it differs from those in the column headings. 1	1.5	2	3	4	5	6	7	8	10	12	13	14	16	18	20	22	25	28	34	44	54	70
Very Small Dia. Boring	CKB →E66	up to 3			Coated Inserts and Dedicated SUMIDIA Inserts		●	●	●	●	●	●	●																
	BXBR (Expansion) →E72		up to 5		Coated Carbide					● 2.0 to 5.0 0.5 increments																			
	DABB →E81		up to 2		Brazed SUMIDIA						●	●	●		●														
Stop Boring	BSME (Oil Hole) →E73		up to 4		Brazed SUMIBORON					Ⓗ 2.5 to 5.0 0.5 increments																			
	SEXC (Oil Hole) (Expansion) →E74		up to 3		Dedicated Inserts						Ⓗ	Ⓗ	Ⓗ																
	BNBX (Expansion) →E78		up to 5		Brazed SUMIBORON							● 2.5 to 8.5 0.5 increments																	
	BNB (Expansion) →E80		up to 4		SUMIBORON SUMIDIA Dedicated Inserts										●	●		●		●		●							
	S-STUB/ S-STUP [BBPT] →E42	up to 3													●	●	●		●	●	●	●	●		●				
	A-STUP (Oil Hole) →E42	up to 3														Ⓗ	Ⓗ		Ⓗ		Ⓗ		Ⓗ		Ⓗ				
	B-STUP [XBPT] →E43			up to 6												●	●		●	●	●	●	●	●	●		● 40		
	D-STUP (Oil Hole) [XBPT-H] →E44			up to 6															Ⓗ		Ⓗ		Ⓗ						
	C-STUB/ C-STUP [WBPT] →E44		up to 8												●	●	●		●	●	●	●	●	●					
	E-STUP (Oil Hole) [WBPT-H] →E45		up to 8		Triangular type 5° Positive (With Hole) 11° Positive (With Hole)											Ⓗ	Ⓗ		Ⓗ	Ⓗ	Ⓗ	Ⓗ							
	S-CTFP →E46	up to 3			Triangular type 11° Positive (Without Hole)															●		●		●		● 32			
	S-PTFN →E48	up to 3																							● 32	● 40	● 50	● 63
	B-PTFN →E48			up to 6																					● 32	● 40	● 50	
	S-DTFN →E47	up to 3																								● 40	● 50	● 63
	D-DTFN (Oil Hole) →E47			up to 6																					Ⓗ 32	Ⓗ 40	Ⓗ 50	
	S-ETFN [BTFN] →E49	up to 3			Triangular type Negative (With Hole)																				●	●	●		
Bottom Facing	BNZ (Expansion) →E79		up to 5		SUMIBORON Dedicated Inserts									●		● 9	● 11	●			● 17		● 21						
	S-SCLC →E18	up to 3										●	●	●	●	●	●		●		●		●		● 27			
	A-SCLC (Oil Hole) →E18	up to 3														Ⓗ	Ⓗ		Ⓗ		Ⓗ		Ⓗ		Ⓗ 27			
	B-SCLC →E19			up to 6	80° Diamond type 7° Positive (With Hole)											●	●		●	●		●		●		● 32			

Inside [ ] shows previous product series (Oil Hole): With oil hole

: Steel Shank : Carbide Shank : Steel Shank with Anti-Vibration Mechanism

Coloured box: Manufacturable size (no oil hole), ●: In stock, Ⓗ: In stock with oil hole

Selection Guide for Boring Bars

Applications	Tool Type	Shank Material Boring Depth (L/D) Steel	Carbide	Anti-Vibration	Applicable Inserts and Shapes	Tooling	Min. Bore Dia. (mm) *The actual values will be written in the table if it differs from those in the column headings.
Bottom Facing	C-SCLC →E20		up to 8		80° Diamond type 7° Positive (With Hole)		5 ● 6 ● 7 ● 8 ● 10 ● 12 ● 13 ● 14 ● 16 ● 20 ● 25 ●
	E-SCLC (Oil Hole) →E20		up to 8				10 H 13 H 16 H 20 H
	S-SCLP [BBPC] →E21	up to 3					12 ● 14 ● 16 ● 18 ● 22 ● 28 ● 27
	A-SCLP (Oil Hole) →E21	up to 3					12 H 14 H 16 H 18 H 22 H 28 H 27
	B-SCLP [XBPC] →E22			up to 6			14 ● 18 ● 22 ●
	D-SCLP (Oil Hole) [XBPC-H] →E22			up to 6			14 H 18 H 22 H
	C-SCLP [WBPC] →E22		up to 8		80° Diamond type 11° Positive (With Hole)		12 ● 14 ● 16 ● 18 ● 20 ●
	S-DCLN →E23	up to 3				DCLN type	28 ● 34 ● 40 ● 50 ● 63
	D-DCLN (Oil Hole) →E23			up to 6			28 H 34 H 40 H 50
	S-PCLN →E24	up to 3				PCLN type / ECLN type	28 ● 34 ● 40 ● 50 ● 63
	B-PCLN →E24			up to 6			34 ● 40 ● 50
	S-ECLN [BCLN] →E25	up to 3			80° Diamond type Negative (With Hole)		26 ● 28 ● 34 ● 40 ● 50
	D-DWLN (Oil Hole) →E64			up to 6			28 H 34 H 40 H 50
	S-DWLN →E64	up to 3					28 ● 34 ● 40 ● 50 ● 63
	S-PWLN →E65	up to 3			Trigon type Negative (With Hole)		34 ● 40 ● 50

Applications	Tool Type	Shank Material Boring Depth (L/D) Steel	Carbide	Anti-Vibration	Applicable Inserts and Shapes	Tooling	Min. Bore Dia. (mm) *The actual values will be written in the table if it differs from those in the column headings.
Profiling	S-SDUC S-SDQC →E26, E28	up to 3				SDUC type SDQC type	6 ● 8 ● 10 ● 12 ● 13 ● 14 ● 16 ● 18 ● 20 ● 22 ● 25 ● 23 ● 28 ● 32 ●
	A-SDUC (Oil Hole) A-SDQC (Oil Hole) →E26, E28	up to 3					13 H 16 H 20 H 25 H 23 H 28 H 32 H
	B-SDUC B-SDQC →E27, E29			up to 6			13 ● 16 ● 20 ● 25 ● 28 ● 32 ●
	C-SDUC →E27		up to 8				13 ● 16 ● 20 ● 25 ●
	S-SDZC →E30	up to 3			55° Diamond type 7° Positive (With Hole)		13 ● 16 ● 20 ● 25 ● 23 ● 28 ● 32 ●
	S-SVJB →E50	up to 3					25 ● 32 ● 30 ● 40 ● 50 ●
	B-SVJB →E50			up to 6			25 ● 32 ● 30 ●
	S-SVJC →E51	up to 3					16 ● 20 ●
	S-SVQC S-SVUC →E54, E57	up to 3				SVU□/SVQ□ type	14 ● 16 ● 20 ● 25 ●
	A-SVUC (Oil Hole) →E57	up to 3					25 H 28 H 32 H 34 H
	A-SVQC (Oil Hole) →E54	up to 3			35° Diamond type 5° Positive (With Hole) 7° Positive (With Hole)		20 H 25 H 32 H 34 H

Inside [ ] shows previous product series (Oil Hole): With oil hole

: Steel Shank : Carbide Shank : Steel Shank with Anti-Vibration Mechanism

Coloured box: Manufacturable size (no oil hole), ●: In stock, H: In stock with oil hole

Selection Guide for Boring Bars

Applications	Tool Type	Shank Material Boring Depth (L/D) Steel	Carbide	Anti-Vibration	Applicable Inserts and Shapes	Tooling	Min. Bore Dia. (mm) 6	8	10	12	13	14	16	18	20	22	25	28	32	34	35	40	44	50	54	63	70
Profiling	**S-SVQB** **S-SVUB** →E52, E55	up to 3			35° Diamond type 5° Positive (With Hole) 7° Positive (With Hole)	SVU□/SVQ□ type									●		●	●	●	●		●		●			
	B-SVQB **B-SVUB** →E52, E55			up to 6											●		●										
	C-SVQB **C-SVUB** →E53, E56		up to 8												●		●										
	S-SVZB →E58	up to 3															●		●	●		●		●			
	S-SVZC →E60	up to 3											●		●												
	B-SVZB →E58			up to 6											●		●										
	C-SVZB →E59		up to 8												●		●										
	S-DDQN →E31	up to 3																				●					
	S-DDUN →E31	up to 3																				●		●		●	
	D-DDUN Oil Hole →E32			up to 6																		H		H			
	S-PDUN →E32	up to 3																	●			●	●	●		●	
	S-EDUN [BDUN] →E32	up to 3																		●			●				
	S-PDZN →E33	up to 3																				●	●	●		●	
	S-EDZN [BDZN] →E33	up to 3			55° Diamond type Negative (With Hole)															●			●				
	S-DTR55C →E34	up to 3			Dedicated T-REX Inserts																		●	●			
Through Boring	**S-SWUB** [BBPW] →E62	up to 3			Trigon type 5° Positive (With Hole) 11° Positive (With Hole)		● 5.5	●	●	●																	
	C-SWUB [WBPW] →E62		up to 8				● 5.5																				
	S-SWUP →E63	up to 3										●		●		●											
	S-SSKP [BBPS] →E36	up to 3			Square type 11° Positive (With Hole)								●		●		●	●									
	C-SSKP [WBPS] →E36		up to 8										●		●												
	S-SSKC →E38	up to 3			Square type 7° Positive (With Hole)										●		●		●			●					
	S-CSKP →E37	up to 3			Square type 11° Positive (Without Hole)										●		●										
	S-DSKN →E39	up to 3			Square type Negative (With Hole)														●			●		●		●	
	S-PSKN →E39	up to 3																				●	●	●	●	●	●
	S-PSYN →E40	up to 3																					●				
	S-ESKN [BSKN] →E40	up to 3																		●			●				
	S-ESYN [BSYN] →E41	up to 3																									
							6	8	10	12	13	14	16	18	20	22	25	28	32	34	35	40	44	50	54	63	70

Inside [ ] shows previous product series Oil Hole: With oil hole

: Steel Shank : Carbide Shank : Steel Shank with Anti-Vibration Mechanism

Coloured box: Manufacturable size (no oil hole), ●: In stock, H: In stock with oil hole

Boring Bar series

■ General Features

Since its launch in 1976, our industry leading SEC-Boring Bar series with its steel/carbide shank holders and high rigidity heads have since included the popular SEC-Small Diameter Boring Bars and now the SumiTurn X-Bars with anti-vibration mechanism, optimised insert grades and chipbreakers.

■ Features of SEC-Boring Bars

- Suitable for a wide variety of applications.
  Stop-Boring / Bottom Facing / Through-Boring / Profiling
- Min. bore diameter: ø1mm for CKB series, ø5mm for C-SCLC type.
- Anti-vibration boring bar SumiTurn X-Bar.
- Smart Dampers for Internal Boring with Built-in Anti-Vibration Mechanism.
- Carbide short shank type usable on turret lathes without shortening (C16M-STUP, C20M-STUP types).
- Wide selection of insert grades and chipbreakers available for various work materials.

■ Steel Shank type with Anti-Vibration Mechanism

SumiTurn X-Bar

- Higher anti-chatter capability for effective rough boring of deep holes.
- Achieves low-cost boring of large diameters and deep holes, with ø32mm shank now in stock.
- Excellent chip control with double chip pockets.
- Bars with internal coolant hole are also in stock.
- Negative insert holders (shank dia. ø25 to ø50mm) are now in stock.

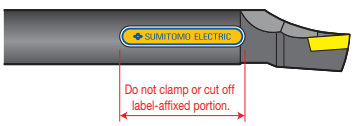
■ Shank Material Selection

SumiTurn X-Bar

Application \ Shank Material		Steel	Steel with Anti-Vibration Mechanism	Carbide
General Steel	Shallow Holes (L/D < 3)	◎		
	Deep Holes (L/D > 3)		◎	◎
High-efficiency boring with wiper insert			○	◎
Hardened Steel			—	◎
High-precision Turning				◎

◎ 1st Recommendation ○ 2nd Recommendation

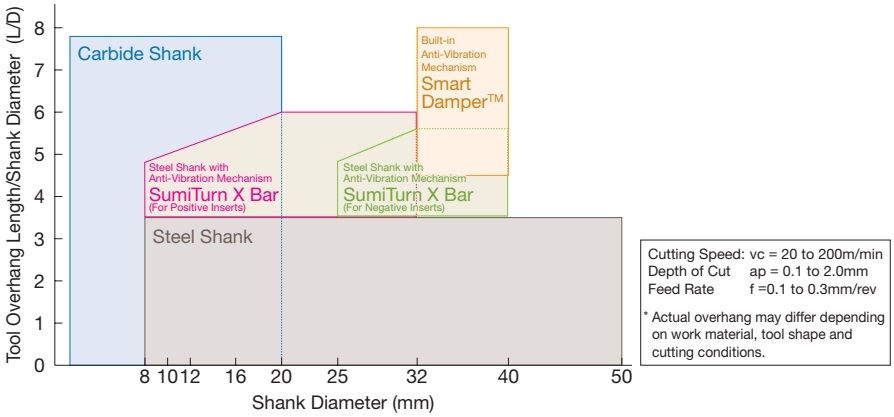
⚠ Precautions for Clamping Position on Steel Shank with Anti-Vibration Mechanism



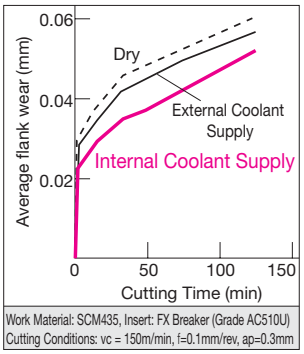
Clamping on the SUMITOMO ELECTRIC label-affixed portion may disrupt dampening functions. (due to built-in Anti-Vibratic Mechanism). Therefore, minimum tool overhang length is kept to 3.5D (shank diameter x 3.5). This is a dedicated turning tool. It cannot be used as a rotating tool.

Boring Bar series

■ Application Range by Shank type



■ Wear Comparison by Coolant Supply Method



Work Material: SCM435, Insert: FX Breaker (Grade AC510U)
Cutting Conditions: vc = 150m/min, f=0.1mm/rev, ap=0.3mm

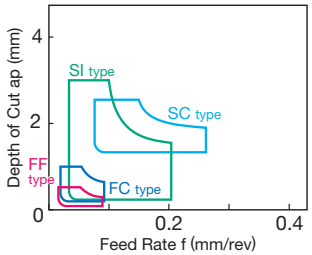
■ Recommended Grades

Insert Grade		Application Range: High Precision	Application Range: Finishing to Light Cutting	Application Range: Medium Cutting	P General Steel	M Stainless Steel	K Cast Iron	S Heat-Resistant Alloy	H Hardened Steel	N Non-Ferrous Metals	Sintered Alloy
Coated Carbide	CVD		AC8015P		◎						
			AC8020P		◎						
			AC8025P		◎		○				
			AC8035P		◎	○					
			AC6020M		○	◎					
			AC6030M		○	◎					
			AC4010K				◎				
			AC4015K				◎				
			AC420K				◎				
	PVD		ACZ150		◎	◎				○	
			AC5015S		○		○	◎			
			AC5025S		○	○	○	◎			
			AC530U		◎	◎	○	○		○	
			AC1030U		◎	◎	○	○		○	
			AC6040M			◎					
Uncoated Cermet Coated Cermet			T1000A		◎	○	◎			○	○
			T1500A/T1500Z		◎	○	○			○	
			T2500Z		◎	○	○				
Cemented Carbide			G10E				◎			○	
CBN (SUMIBORON)			BN1000						◎		
			BN2000						◎		
			Expansion BNC2105						◎		
			BNC2115						◎		
			BNC2125						◎		
			BNC2010						○		
			BNC2020						○		
			Expansion BN7125				◎	○			○
			BN7115								◎
PCD (SUMIDIA)			DA1000							◎	
			DA150							◎	

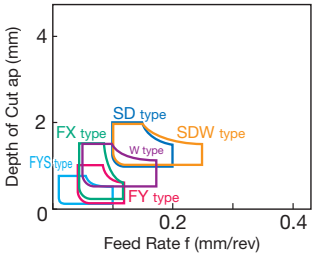
◎ 1st Recommendation ○ 2nd Recommendation

■ Recommended Chipbreakers

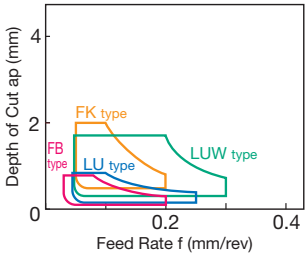
● G Class Chipbreakers



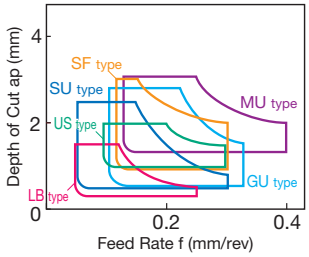
● G Class Ground type



● M Class Finishing to Light Cutting



● M Class Light to Medium Cutting



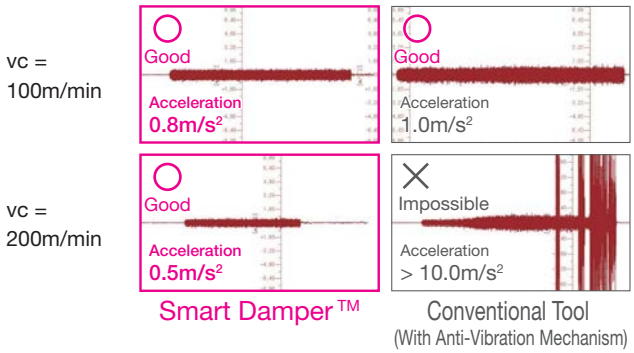
Smart Damper™

■ Features

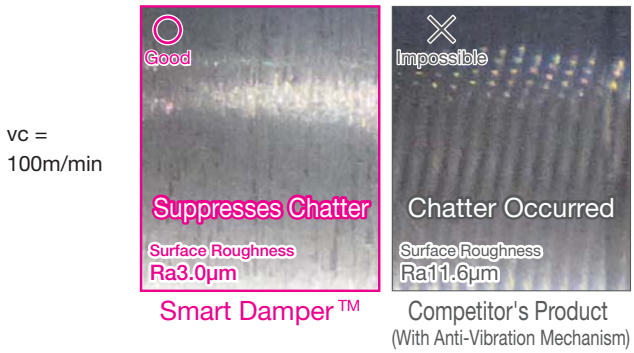
- Adopts a special damper mechanism to suppress chattering for large diameter bars with long overhang of L/D=5.5 to 8.
- Replaceable heads enable a wide selection of positive and negative inserts.
- Internal coolant supply improves chip evacuation and tool life. (For use with internal coolant supply, keep the coolant pressure at or below 3MPa.)

■ Cutting Performance

Overhang Amount 6D Vibration during Machining



Overhang Amount 9D* Surface Roughness during Machining



Work Material: S45C (Work Dia. ø40 up) Holder: ø32 Shank Insert: TPMT160404N-SU Cutting Conditions: f = 0.1mm/rev ap = 0.2mm Dry

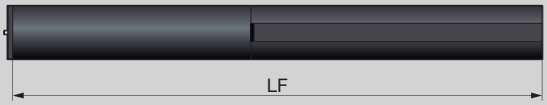
*Machining performed with 9D overhang was for anti-vibration performance evaluation only; to prevent tool deflection, use up to a maximum of 8D.

■ Smart Damper™ Combination Examples

Indexable Head

For Positive Inserts	For Negative Inserts
SCLC type SCLP type	DCLN type
SDUC type SDQC type	DDUN type
STUP type	DTFN type
SVUB type SVQB type	

Smart Damper™ Body



S-SDB3240L320 Shank Dia.: ø32mm LF: 320mm
S-SDB4050L410 Shank Dia.: ø40mm LF: 410mm

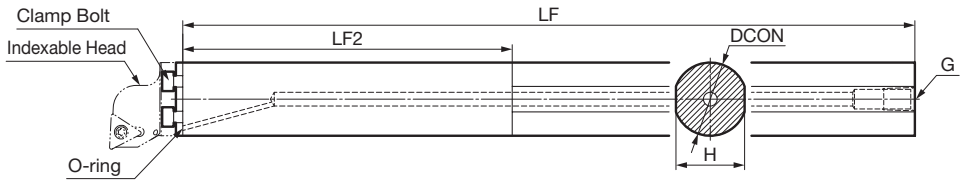
Indexable heads can be selected to suit machining applications

*Smart Damper™ is a registered trademark of BIG DAISHOWA Co., Ltd.

Smart Damper™

Anti-Vibration | Internal Coolant

Fig 1



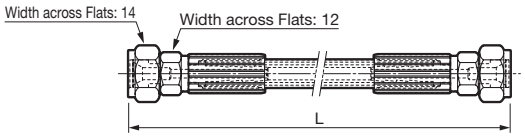
Smart Damper™ Body

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Overall Length LF	Length LF2	Height H	Shank G	Indexable Head Group No.	Weight (kg)	Fig	Clamp Bolt		Wrench	O-ring
											N·m	(For Hexagonal hole)	
S-SDB3240L320	●	32	320	144	30	Rc1/4	1	2.3	1	BX0510	3.0	LH040	SS020
S-SDB4050L410	●	40	410	170	37	Rc3/8	2	4.5	1	BX0610	5.2	LH050	SS020

Refer to the user's manual for methods of mounting indexable heads. Indexable heads are not included with the Smart Damper™ body.
Indexable Heads E12 to E15
Because the anti-vibration mechanism is built in, clamping to the LF2 dimension may disrupt dampening functions.
The indexable head is not included in the weight.
Three clamp bolts and two O-rings (including one spare) are included.

Fig 1



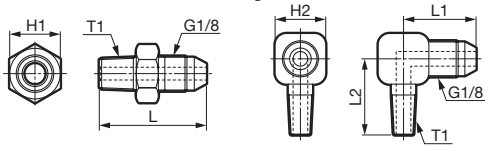
Parts (Hose)

Dimensions (mm)

Cat. No.	Stock	L	Screw Standard	Screw Standard	Fig
J-HOSE-G1/8-G1/8-200	●	200	G1/8	G1/8	1
J-HOSE-G1/8-G1/8-300	●	300	G1/8	G1/8	1

Hoses are sold separately.

Fig 1 Fig 2



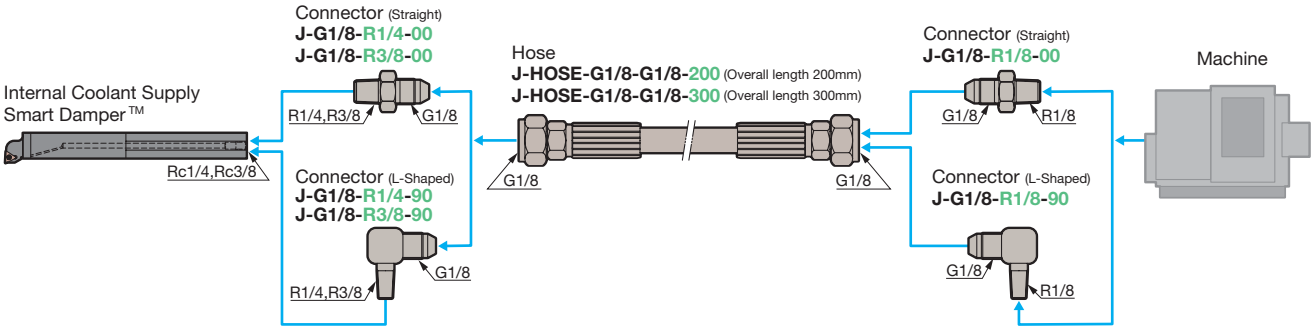
Parts (Connector)

Dimensions (mm)

Cat. No.	Stock	Screw Standard T1	L	L1	L2	H1	H2	Fig
J-G1/8-R1/4-00	●	R1/4	34	—	—	14	—	1
J-G1/8-R1/8-00	●	R1/8	29	—	—	14	—	1
J-G1/8-R3/8-00	●	R3/8	36	—	—	19	—	1
J-G1/8-R1/4-90	●	R1/4	—	22	25	—	17	2
J-G1/8-R1/8-90	●	R1/8	—	20	21	—	14	2
J-G1/8-R3/8-90	●	R3/8	—	23	30	—	19	2

Connectors are sold separately.

Piping Method for Hoses and Connectors



· Apply sealant such as commercial sealing tape to the piping connection parts.

Identification Code (Smart Damper™ Body)

S-SDB 32 40 L320

- S-SDB: Connection Method
- 32: Shank Dia.
- 40: Min. Bore Dia.
- L320: Overall Length

Identification Code (Indexable Head)

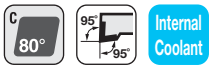
SDB 32 - SCLCR09T3 - 40

- SDB: Connection Method
- 32: Compatible Shank Dia.
- SCLCR09T3: (Conforms to boring bar ISO standard classification) See page E4
- 40: Min. Bore Dia.

*Smart Damper™ is a registered trademark of BIG DAISHOWA Co., Ltd.

N·m Recommended Tightening Torque (N·m)

Smart Damper™



Internal Boring
Screw-on, Internal Coolant Supply

SCLC
Bottom Facing

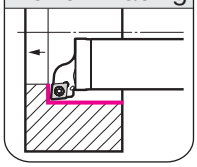
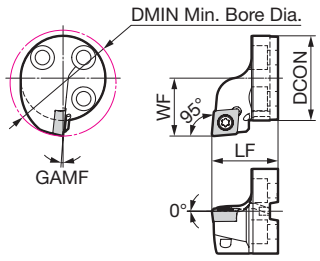


Fig 1



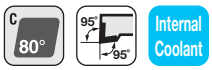
Indexable Heads (For Positive Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Smart Damper™ Group No.	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDB32-SCLC R/L09T3-40	●	●	**40**	32	25	22	-6°	CC□□09T3	**B73~**	1	1	BFTX0409N	**3.4**	TRX15
SDB40-SCLC R/L09T3-50	●	●	**50**	40	25	27	-2°			2	1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.



Internal Boring
Screw-on, Internal Coolant Supply

SCLP
Bottom Facing

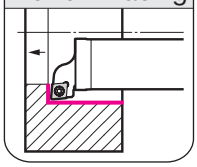
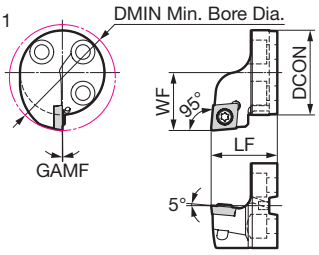


Fig 1



Indexable Heads (For Positive Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Smart Damper™ Group No.	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDB32-SCLP R/L0903-40	●		**40**	32	25	22	0°	CP□□0903	**B77~**	1	1	BFTX0409N	**3.4**	TRX15
SDB40-SCLP R/L0903-50	●		**50**	40	25	27	0°			2	1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.

Note: The values in red (rake angle GAMF) have been changed from those in the 2021-2022 General Catalogue.

*Smart Damper™ is a registered trademark of BIG DAISHOWA Co., Ltd.

N·m Recommended Tightening Torque (N·m)

Smart Damper™

Internal Boring
Screw-on, Internal Coolant Supply

SDUC
Profiling

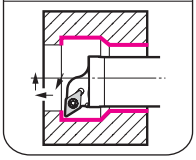
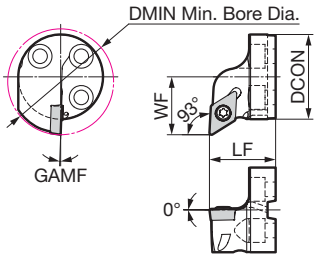


Fig 1



Indexable Heads (For Positive Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Smart Damper™ Group No.	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDB32-SDUC R/L11T3-40	●	●	**40**	32	25	22	-2°	DC□□11T3	B84~	1	1	BFTX0409N	3.4	TRX15
SDB40-SDUC R/L11T3-50	●	●	**50**	40	25	27	0°			2	1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.

Internal Boring
Screw-on, Internal Coolant Supply

SDQC
Profiling

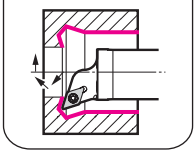
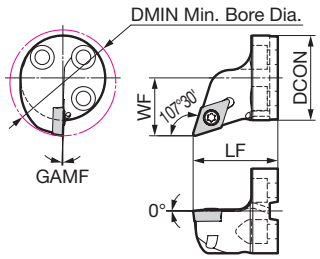


Fig 1



Indexable Heads (For Positive Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Smart Damper™ Group No.	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDB32-SDQC R/L11T3-40	●	●	**40**	32	32	22	-2°	DC□□11T3	B84~	1	1	BFTX0409N	3.4	TRX15
SDB40-SDQC R/L11T3-50	●	●	**50**	40	32	27	0°			2	1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
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N·m Recommended Tightening Torque (N·m)

Smart Damper™

Internal Boring
Screw-on, Internal Coolant Supply

STUP
Stop Boring

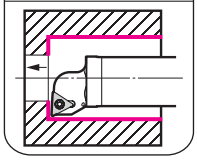
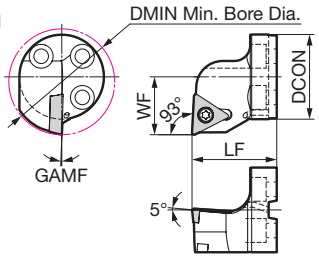


Fig 1



Indexable Heads (For Positive Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Rake Angle GAMF	Applicable Inserts Cat. No.	Ref. Page	Smart Damper™ Group No.	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDB32-STUP R/L1103-40	●	●	**40**	32	25	22	-2°	TP□□1103	B109~	1	1	BFTX0307N	2.0	TRX10
SDB40-STUP R/L1103-50	●	●	**50**	40	25	27	0°			2	1			
SDB32-STUP R/L1604-40	●	●	**40**	32	32	22	-2°	TP□□1604	B112	1	1	BFTX0409N	3.4	TRX15
SDB40-STUP R/L1604-50	●	●	**50**	40	32	27	0°			2	1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.

Internal Boring
Screw-on, Internal Coolant Supply

SVUB
Profiling

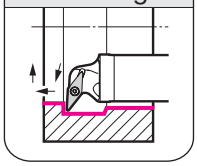
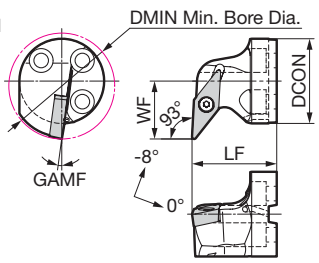


Fig 1



Indexable Heads (For Positive Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Rake Angle GAMF	Applicable Insert Cat. No.	Ref. Page	Smart Damper™ Group No.	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDB32-SVUB R/L1604-40	●		**40**	32	32	22	(-7.5°)	VB□□1604	B120	1	1	BFTX03508N	2.0	TRX10
SDB40-SVUB R/L1604-50	●		**50**	40	32	27	(-7.5°)			2	1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.

Internal Boring
Screw-on, Internal Coolant Supply

SVQB
Profiling

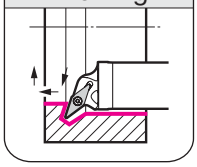
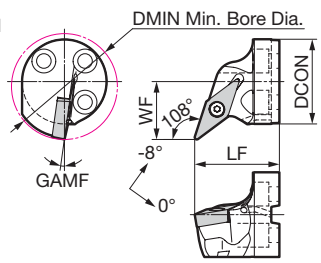


Fig 1



Indexable Heads (For Positive Inserts)

Parts

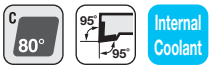
Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Rake Angle GAMF	Applicable Insert Cat. No.	Ref. Page	Smart Damper™ Group No.	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
SDB32-SVQB R/L1604-40	●		**40**	32	32	22	(-6.5°)	VB□□1604	B120	1	1	BFTX03508N	2.0	TRX10
SDB40-SVQB R/L1604-50	●		**50**	40	32	27	(-6.5°)			2	1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.
*Smart Damper™ is a registered trademark of BIG DAISHOWA Co., Ltd.

N·m Recommended Tightening Torque (N·m)

Smart Damper™



Internal Boring
Internal Coolant Supply Double Clamp

DCLN
Bottom Facing

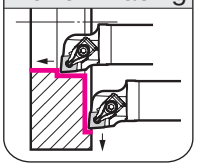
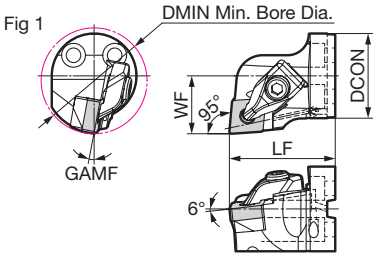


Fig 1



● Feed direction of applicable inserts differs for DCLN type according to machining application.

For Internal Boring
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
For Facing
Right-handed (R) tool holders are compatible with right-handed (R) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with left-handed (L) or neutral (N) inserts.

Indexable Heads (For Negative Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Smart Damper™ Group No.	Fig	Clamp Set	N·m	Shim	Shim Screw	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
SDB32-DCLN R/L1204-40	●	●	**40**	32	40	22	CN□□1204	**B16~**	1	1	SCP-2	**5.0**	CNS1204B	BFTX0409N	LH040	LH025
SDB40-DCLN R/L1204-50	●	●	**50**	40	40	27			2	1						

*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.

Clamp Set Parts E82

Internal Boring
Internal Coolant Supply Double Clamp

DDUN
Profiling

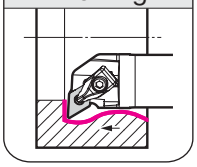
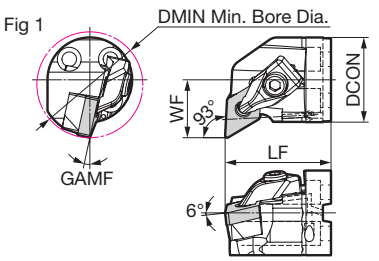


Fig 1



Indexable Heads (For Negative Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Smart Damper™ Group No.	Fig	Clamp Set	N·m	Shim	Shim Screw	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
SDB32-DDUN R/L1504-40	●	●	**40**	32	40	22	DN□□1504	**B26~**	1	1	SCP-2	**5.0**	DNS1504B	BFTX0409N	LH040	LH025
SDB40-DDUN R/L1504-50	●	●	**50**	40	40	27			2	1						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.

Clamp Set Parts E82

Internal Boring
Internal Coolant Supply Double Clamp

DTFN
Stop Boring

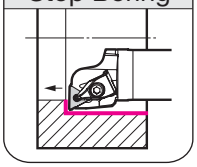
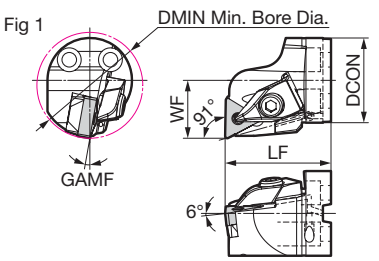


Fig 1



Indexable Heads (For Negative Inserts)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Overall Length LF	Cutting Edge Distance WF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Smart Damper™ Group No.	Fig	Clamp Set	N·m	Shim	Shim Screw	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
SDB32-DTFN R/L1604-40	●		**40**	32	40	22	TN□□1604	**B50~**	1	1	SCP-1	**5.0**	TNS1604B	BFTX0307N	LH040	LH025
SDB40-DTFN R/L1604-50	●		**50**	40	40	27			2	1						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
*Refer to Smart Damper™ body Group Nos. on E11 for applicable Smart Damper™ bodies.

Clamp Set Parts E82

*Smart Damper™ is a registered trademark of BIG DAISHOWA Co., Ltd.

N·m Recommended Tightening Torque (N·m)

Twin Head Holder

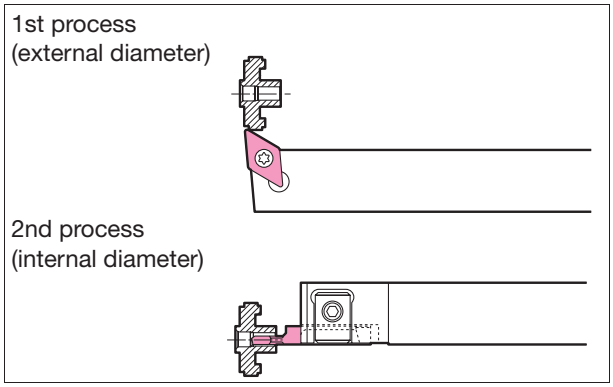
TWIN HEAD

■ Features

- Having one holder that performs two operations is equivalent to mounting an additional tool on the drill sleeve toolpost.
- External turning possible with the aid of a drill sleeve.
- 2 holder configurations, internal + external and internal + internal, are standard stocked items.
- Centre height difference of the 2 cutting edges is below 40μm, which is good for high-precision machining.

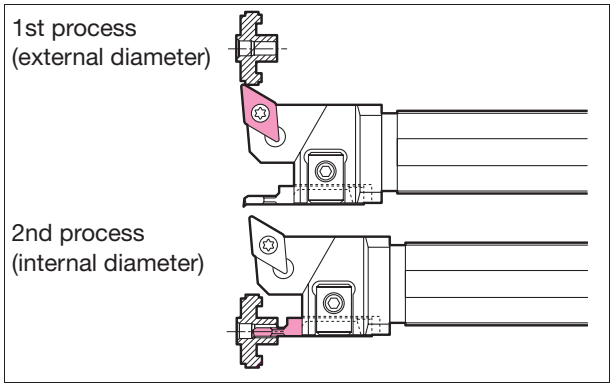
■ Advantages of the Twin Head Holder

● Conventional Tool



· 2 different operations requiring 2 separate tools.

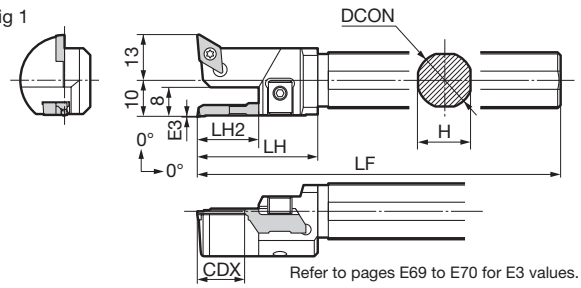
● Twin head holder



· A single tool performing 2 different operations.

· Toolpost moving time can also be reduced.

Fig 1



Refer to pages E69 to E70 for E3 values.

Internal Boring + External Turning
Screw-on + Clamp-on

SumiSmall

Holder (mm) (Internal Boring Depth of 6.0mm)

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Head LH	Boring Depth CDX	Head LH2	*Max. Work Material Dia.	Insert for Internal Boring	Insert for External Turning	Fig
S1588X-CKBE-06	●	15.875	15	130	27	6	10	**12.0**	KBMX ROO06-OO KBMX ROO06-OOT	DC□□0702OO	1
S16X-CKBE-06	●	16	15	130	27	6	10	**12.0**			1
S1905X-CKBE-06	●	19.05	17	130	27	6	10	**12.0**			1
S20X-CKBE-06	●	20	18	130	27	6	10	**12.0**			1
S22X-CKBE-06	●	22	20	130	27	6	10	**12.0**			1

* When machining internal diameter

Holder (mm) (Internal Boring Depth of 11.0mm)

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Head LH	Boring Depth CDX	Head LH2	*Max. Work Material Dia.	Insert for Internal Boring	Insert for External Turning	Fig
S1588X-CKBE-11	●	15.875	15	130	32	11	15	**12.0**	KBMX ROO11-OO KBMX ROO11-OOT	DC□□0702OO	1
S16X-CKBE-11	●	16	15	130	32	11	15	**12.0**			1
S1905X-CKBE-11	●	19.05	17	130	32	11	15	**12.0**			1
S20X-CKBE-11	●	20	18	130	32	11	15	**12.0**			1
S22X-CKBE-11	●	22	20	130	32	11	15	**12.0**			1

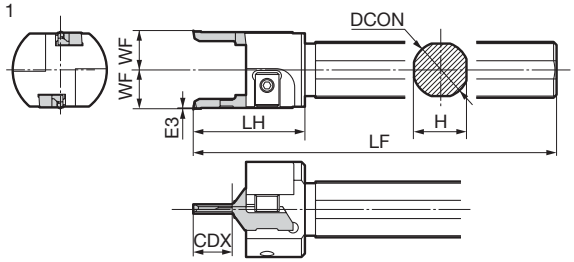
* When machining internal diameter

Internal Diameter Inserts E69 to E70 External Diameter Inserts B80 to B82

Twin Head Holder

Internal Boring, Face Grooving
Clamp-on

Fig 1



Holder

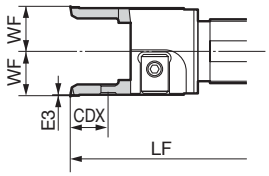
Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Head LH	Cutting Edge Distance WF	Boring Depth CDX	Insert for Internal Boring	Face Grooving Inserts	Fig
S1588X-CKBB-F	●	15.875	15	130	32	11.0	11	KBMX R0000-00 KBMX R0000-00T	KBMF R0000-05	1
S16X-CKBB-F	●	16	15	130	32	11.0	11			1
S1905X-CKBB-F	●	19.05	17	130	32	11.0	11			1
S20X-CKBB-F	●	20	18	130	32	11.0	11			1
S22X-CKBB-F	●	22	20	130	32	11.0	11			1

* Reference values for LF, WF and CDX dimensions are with KBMXR0311-○○(T) mounted. (Refer to the table below for dimensions with other inserts mounted.)

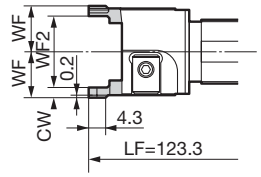
Ref. Page for Inserts E69 to E70

Insert: KBMX (ID+ID) assembled



Insert	Offset E3	Boring Depth CDX	Cutting Edge Distance WF	Overall Length LF
KBMX R0103-○○(T)	0.2	3	10.9	122
KBMX R01506-○○(T)	0.25	6	10.95	125
KBMX R0206-○○(T)	0.25	6	10.95	125
KBMX R0311-○○(T)*	0.3	11	11.0	130
KBMX R0411-○○(T)	0.5	11	11.2	130
KBMX R0511-○○(T)	0.7	11	11.4	130
KBMX R0420-○○(T)	0.5	20	11.2	139
KBMX R0520-○○(T)	0.7	20	11.4	139

Insert: KBMF (Face+Face) assembled



Insert	Cutting Edge Distance WF	Cutting Edge Distance WF2	Width of Cut CW
KBMF R0615-05	10.9	18.8	1.5
KBMF R0620-05	10.9	17.8	2.0
KBMF R0630-05	10.9	15.8	3.0

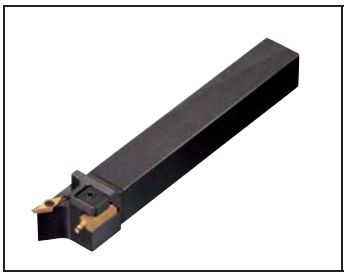
Part (KBM□R insert mounting part)

Clamp Plate	Double Screw	Wrench
		(For Hexagonal hole)
CKBW16	WB4-8	LH020

Part (DC□□ insert mounting part)

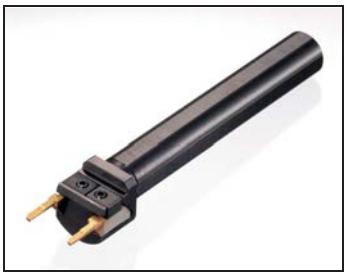
Flat Insert Screw		Wrench
	N·m	(For Torx hole)
BFTX02506N	1.5	TRX08

Special Holder Configurations



Internal diameter + external diameter (Square holder)

Internal diameter + centre drill



Internal diameter + internal diameter (parallel design)

Holder configurations for different work materials or various machining applications, such as centre holes, chamfering and external necking, can be made to order.

S-SCLC type / A-SCLC type

Internal Finishing to Medium Cutting
Screw-on

S-SCLC
Bottom Facing

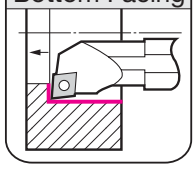


Fig 1

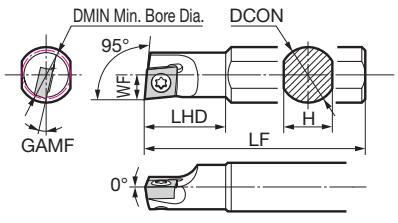


Fig 2

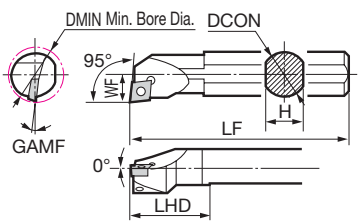


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S08H-SCLC R/L03X1-05**	—	●	●	**5**	8	7	100	2.5	24	-15°	CC□□03X1	**B68**	1	BFTX016033	**0.2**	TRX06
	S08H-SCLC R/L03X1-06	—	●	●	**6**	8	7	100	3.0	28	-13°			1			
	S08H-SCLC R/L04X1-07	—	●	●	**7**	8	7	100	3.5	32	-13°	CC□□04X1	**B69**	1	BFTX0203N	**0.5**	TRX06
	S08H-SCLC R/L04X1-08	—	●	●	**8**	8	7	100	4.0	37	-11°			1			
	S08H-SCLC R/L0602-10	S08H-SCLC R/L 06	●	●	**10**	8	7	100	5.5	19	-13°	CC□□0602	**B70~**	2	BFTX02505N	**1.1**	TRX08
	S10K-SCLC R/L0602-12	S10K-SCLC R/L 06-12	●	●	**12**	10	9	125	6.0	21	-12°			2	BFTX02506N	**1.5**	
	S12M-SCLC R/L0602-14	S12M-SCLC R/L 06-14	●	●	**14**	12	11	150	7.0	25	-10°			2			
	S16R-SCLC R/L0602-18	—	●	●	**18**	16	15	200	9.0	27	-8°			2			
	S16R-SCLC R/L09T3-18	—	●	●	**18**	16	15	200	9.0	30	-10°	CC□□09T3	**B73~**	2	BFTX0407N	**3.0**	TRX15
	S20S-SCLC R/L09T3-22	—	●	●	**22**	20	18	250	11.0	30	-8°			2	BFTX0409N	**3.4**	
	S25T-SCLC R/L09T3-27	—	●	●	**27**	25	23	300	13.5	35	-6°			2			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E12

Internal Finishing to Medium Cutting
Screw-on

A-SCLC
Bottom Facing

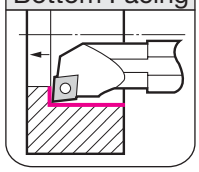


Fig 1

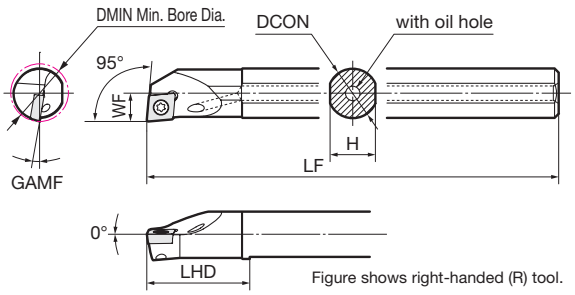


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Oil Hole	**A08H-SCLC R/L0602-10**	●	●	**10**	8	7	100	5.5	19	-13°	CC□□0602	**B70~**	1	BFTX02505N	**1.1**	TRX08
	A10K-SCLC R/L0602-12	●	●	**12**	10	9	125	6.0	21	-12°			1	BFTX02506N	**1.5**	
	A12M-SCLC R/L0602-14	●	●	**14**	12	11	150	7.0	25	-10°			1			
	A16R-SCLC R/L0602-18	●	●	**18**	16	15	200	9.0	27	-8°			1			
	A16R-SCLC R/L09T3-18	●	●	**18**	16	15	200	9.0	30	-10°	CC□□09T3	**B73~**	1	BFTX0407N	**3.0**	TRX15
	A20S-SCLC R/L09T3-22	●	●	**22**	20	18	250	11.0	30	-8°			1	BFTX0409N	**3.4**	
	A25T-SCLC R/L09T3-27	●	●	**27**	25	23	300	13.5	35	-6°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E12

N·m Recommended Tightening Torque (N·m)

B-SCLC type

Internal Finishing to Medium Cutting
Screw-on

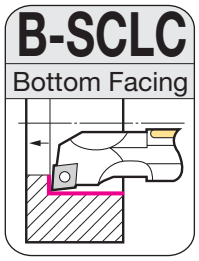


Fig 1

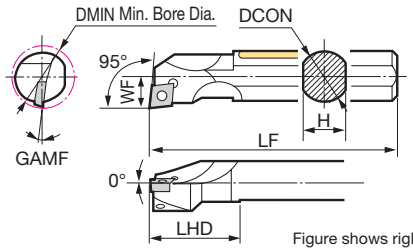


Figure shows right-handed (R) tool.

SumiTurn X-Bar

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism	B08H-SCLC R/L0602-10	●	●	10	8	7	100	5.5	19	-13°	CC□□0602	B70~	1	BFTX02505N	1.1	TRX08
	B10K-SCLC R/L0602-12	●	●	12	10	9	125	6.0	21	-12°			1	BFTX02506N	1.5	
	B12M-SCLC R/L0602-14	●	●	14	12	11	150	7.0	25	-10°			1			
	B12M-SCLC R/L0602-16	●	●	16	12	11	150	9.0	25	-10°			1			
	B16R-SCLC R/L09T3-20	●	●	20	16	15	200	11.0	30	-8°	CC□□09T3	B73~	1	BFTX0407N	3.0	TRX15
	B20S-SCLC R/L09T3-25	●	●	25	20	18	250	13.0	30	-7°			1	BFTX0409N	3.4	
	B25T-SCLC R/L1204-32	●	●	32	25	23	300	17.0	38	-6°	CC□□1204	B75	1	BFTX0511N	5.0	TRX20

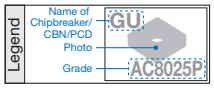
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E12

Applicable Inserts ◀·· S-SCLC type / A-SCLC type / B-SCLC type / C-SCLC type / E-SCLC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6040M	SUMIBORON BN7125/BNC500	MU AC4015K	No Chipbreaker AC4015K	SU AC5015S	SUMIDIA DA1000	AG H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FF AC1030U	SI AC1030U	SC AC1030U	FF AC1030U	SI AC1030U	SC AC1030U	SUMIBORON BN7125/BNC500	—	—	SI AC5015S	SUMIDIA DA1000	—	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	A10~			A14~			A16~			A18~	A22~		A20~		M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

C-SCLC type / E-SCLC type

C 80° | 95° | Carbide

Internal Finishing to Medium Cutting
Screw-on

C-SCLC
Bottom Facing

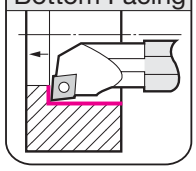


Fig 1

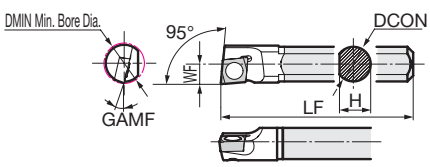
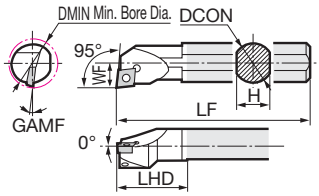


Fig 2



SumiSmall

Holder

Parts

Dimensions (mm)

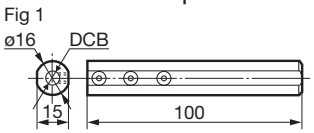
Shank Material	Cat. No.	Previous Cat. No.	Stock R	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Carbide	C04G-SCLC R03X1-05*	C04G-SCLCR03X1-05*	●	5	4	3.8	90	2.5	—	-15°	CC□□03X1	B68	1	BFTX016033	0.2	TRX06
	C05H-SCLC R03X1-06*	C05H-SCLCR03X1-06*	●	6	5	4.4	100	3.0	—	-13°			1			
	C06J-SCLC R04X1-07*	C06J-SCLCR04X1-07*	●	7	6	5.4	110	3.5	—	-13°	CC□□04X1	B69	1	BFTX0203N	0.5	TRX06
	C07K-SCLC R04X1-08*	C07K-SCLCR04X1-08*	●	8	7	6.4	125	4.0	—	-11°			1			
	C08H-SCLC R0602-10	C08H-SCLCR06	●	10	8	7.0	100	5.5	19	-13°	CC□□0602	B70~	2	BFTX02505N	1.1	TRX08
	C10K-SCLC R0602-12	C10K-SCLCR06-12	●	12	10	9.0	125	6.0	21	-12°			2	BFTX02506N	1.5	
	C10K-SCLC R0602-13	C10K-SCLCR06	●	13	10	9.0	125	7.0	21	-12°			2			
	C12M-SCLC R0602-14	C12M-SCLCR06-14	●	14	12	11.0	150	7.0	25	-10°			2			
	C12M-SCLC R0602-16	C12M-SCLCR06	●	16	12	11.0	150	9.0	25	-10°			2			
	C16R-SCLC R09T3-20	C16R-SCLCR09	●	20	16	15.0	200	11.0	30	-8°	CC□□09T3	B73~	2	BFTX0407N	3.4	TRX15
	C20S-SCLC R09T3-25	C20S-SCLCR09	●	25	20	18.0	250	13.0	35	-7°			2	BFTX0409N	3.4	

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
* Separately sold sleeve is required.

Smart Damper™ E12

Adapter Sleeve

Fig 1



Cat. No.	Stock	Bore Dia. DCB	Applicable Holder	Fig
HBB 416	●	4.0	C04G-SCLC R03X1-05	1
HBB 516	●	5.0	C05H-SCLC R03X1-06	1
HBB 616	●	6.0	C06J-SCLC R04X1-07	1
HBB 716	●	7.0	C07K-SCLC R04X1-08	1

C 80° | 95° | Carbide Coolant Hole

Internal Finishing to Medium Cutting
Screw-on

E-SCLC
Bottom Facing

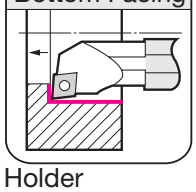
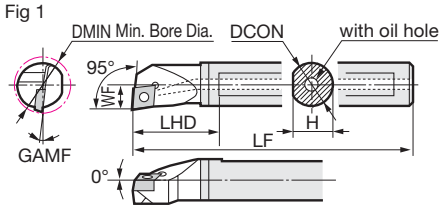


Fig 1



SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Carbide with oil hole	E08H-SCLC R0602-10	E08H-SCLCR06	●	10	8	7.5	100	5.5	18	-13°	CC□□0602	B70~	1	BFTX02505N	1.1	TRX08
	E10K-SCLC R0602-13	E10K-SCLCR06	●	13	10	9.5	125	7.0	19	-12°			1	BFTX02506N	1.5	
	E12M-SCLC R0602-16	E12M-SCLCR06	●	16	12	11.5	150	9.0	25	-10°			1			
	E16R-SCLC R09T3-20	E16R-SCLCR09	●	20	16	15.5	200	11.0	30	-8°	CC□□09T3	B73~	1	BFTX0407N	3.4	TRX15

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.

Smart Damper™ E12

Applicable Inserts

S-SCLC type / A-SCLC type / B-SCLC type / C-SCLC type / E-SCLC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo — GU; Grade — AC8025P

Application Range / Process	P (Steel)			M (Stainless Steel)			K (Cast Iron)			S (Exotic Alloy)	N (Non-Ferrous)		H (Hardened Steel)		Hard Brittle Material
	Finishing	Medium Cutting	Roughing	Finishing	Medium Cutting	Roughing	High-speed Finishing	Finishing to Medium Cutting	Medium to Roughing	Finishing to Medium Cutting	High-precision/Finishing	Finishing to Medium Cutting	Coated	Uncoated	—
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6040M	SUMIBORON BN7125/BNC500	MU AC4015K	No Chipbreaker AC4015K	SU AC5015S	SUMIDIA DA1000	AG H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FF AC1030U	SI AC1030U	SC AC1030U	FF AC1030U	SI AC1030U	SC AC1030U	SUMIBORON BN7125/BNC500	—	—	SI AC5015S	SUMIDIA DA1000	—	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	A10~			A14~			A16~			A18~	A22~		A20~		M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-SCLP type / A-SCLP type

Internal Finishing to Medium Cutting
Screw-on

S-SCLP
Bottom Facing

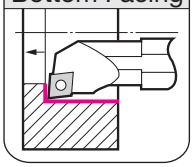


Fig 1

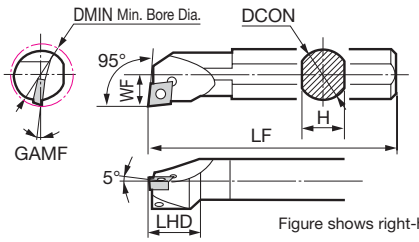


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S10K-SCLP R/L0802-12**	BBPC-010 R/L	●	●	**12**	10	9	125	6.0	12.0	-5°	CP□□0802	**B76**	1	BFTX0305A	**2.0**	TRX10
	S12M-SCLP R/L0802-14	BBPC-012 R/L 14	●	●	**14**	12	11	150	7.0	10.6	-5°			1			
	S12M-SCLP R/L0903-16	—	●	●	**16**	12	11	150	8.0	23.0	-6°	CP□□0903	**B77~**	1	BFTX0407A	**3.4**	TRX15
	S16R-SCLP R/L0903-18	BBPC-316 R/L 18	●	●	**18**	16	15	200	9.0	18.0	-4°			1			
	S20S-SCLP R/L0903-22	BBPC-320 R/L 22	●	●	**22**	20	18	250	11.0	18.0	-2°			1			
	S25T-SCLP R/L0903-27	—	●	●	**27**	25	22	300	13.5	18.0	-2°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E12

Internal Finishing to Medium Cutting
Screw-on

A-SCLP
Bottom Facing

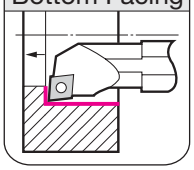


Fig 1

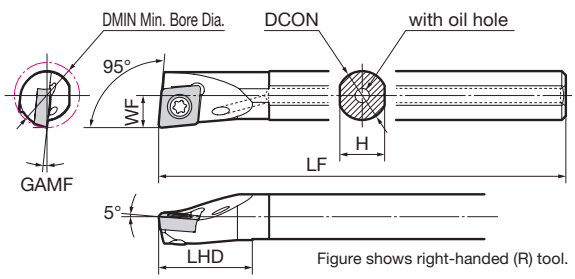


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
with oil hole Steel	**A10K-SCLP R/L0802-12**	●	●	**12**	10	9	125	6.0	12.0	-5°	CP□□0802	**B76**	1	BFTX0305N	**2.0**	TRX10
	A12M-SCLP R/L0802-14	●	●	**14**	12	11	150	7.0	10.6	-5°			1	BFTX0306N	**2.0**	
	A12M-SCLP R/L0903-16	●	●	**16**	12	11	150	8.0	23.0	-6°	CP□□0903	**B77~**	1	BFTX0407N	**3.4**	TRX15
	A16R-SCLP R/L0903-18	●	●	**18**	16	15	200	9.0	18.0	-4°			1			
	A20S-SCLP R/L0903-22	●	●	**22**	20	18	250	11.0	18.0	-2°			1			
	A25T-SCLP R/L0903-27	●	●	**27**	25	22	300	13.5	18.0	-2°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E12

Applicable Inserts ◀·· S-SCLP type / A-SCLP type / B-SCLP type / D-SCLP type / C-SCLP type

1st Recommended Insert

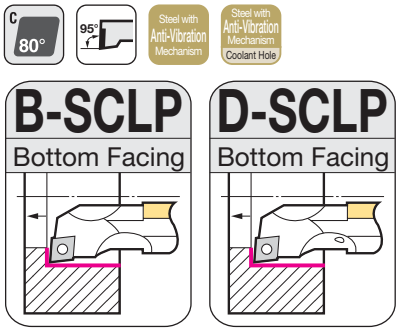
- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo — GU / AC8025P — Grade

Application Range / Process	P (Steel)			M (Stainless Steel)			K (Cast Iron)		S (Exotic Alloy)	N (Non-Ferrous)	H (Hardened Steel)	
	Finishing	Medium Cutting	Roughing	Finishing	Medium Cutting	Roughing	Finishing to Medium Cutting	Medium to Roughing	Finishing to Medium Cutting	—	Coated	Uncoated
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6030M	MU AC4015K	No Chipbreaker AC4015K	SD AC5015S	SUMIDIA DA1000	SUMIBORON BNC2125	SUMIBORON BN2000
High-precision	SD T1500Z	—	—	SD AC5015S	—	—	—	—	SD AC5015S	SUMIDIA DA1000	SUMIBORON BNC2115	SUMIBORON BN1000
Recommended Cutting Conditions	A10~			A14~			A16~		A18~	A22~	A20~	

N·m Recommended Tightening Torque (N·m)

B-SCLP type / D-SCLP type / C-SCLP type



Internal Finishing to Medium Cutting
Screw-on

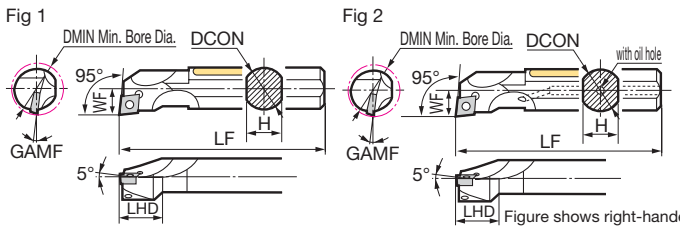


Figure shows right-handed (R) tool.

SumiTurn X-Bar

SumiSmall

Holder

Parts

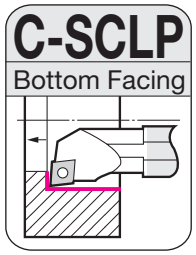
Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism	**B12M-SCLP R/L0802-14**	XBPC-012 R/L 14	●	●	**14**	12	11	150	7	10.6	-5°	CP□□0802	**B76**	1	BFTX0305A	**2.0**	TRX10
	B16R-SCLP R/L0903-18	XBPC-316 R/L 18	●	●	**18**	16	15	200	9	18.0	-4°	CP□□0903	**B77~**	1	BFTX0407A	**3.4**	TRX15
	B20S-SCLP R/L0903-22	XBPC-320 R/L 22	●	●	**22**	20	18	250	11	18.0	-2°			1			
Steel with Anti-Vibration Mechanism and Oil Hole	**D12M-SCLP R/L0802-14**	XBPC-012 R/L H14	●		**14**	12	11	150	7	10.6	-5°	CP□□0802	**B76**	2	BFTX0305A	**2.0**	TRX10
	D16R-SCLP R/L0903-18	XBPC-316 R/L H18	●		**18**	16	15	200	9	18.0	-4°	CP□□0903	**B77~**	2	BFTX0407A	**3.4**	TRX15
	D20S-SCLP R/L0903-22	XBPC-320 R/L H22	●		**22**	20	18	250	11	18.0	-2°			2			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E12

Internal Finishing to Medium Cutting
Screw-on



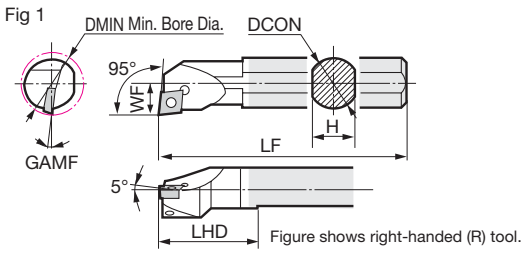


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Carbide	**C10K-SCLP R/L0802-12**	WBPC-010 R/L S	●	●	**12**	10	9	125	6	19	-5°			1			
	C12M-SCLP R/L0802-14	WBPC-012 R/L S14	●	●	**14**	12	11	150	7	25	-5°	CP□□0802	**B76**	1	BFTX0305A	**2.0**	TRX10
	C12M-SCLP R/L0802-16	WBPC-012 R/L S	●	●	**16**	12	11	150	8	25	-3°			1			
	C16R-SCLP R/L0903-18	WBPC-316 R/L S18	●	●	**18**	16	15	200	9	30	-4°	CP□□0903	**B77~**	1	BFTX0407A	**3.4**	TRX15
	C16R-SCLP R/L0903-20	WBPC-316 R/L S	●	●	**20**	16	15	200	10	30	-3°			1			

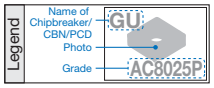
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E12

Applicable Inserts ◀·· S-SCLP type / A-SCLP type / B-SCLP type / D-SCLP type / C-SCLP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) —	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
General Machining	FB **T1500Z**	GU **AC8025P**	MU **AC8025P**	LB **AC6030M**	GU **AC6030M**	MU **AC6030M**	MU **AC4015K**	No Chipbreaker **AC4015K**	SD **AC5015S**	SUMIDIA **DA1000**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**
High-precision	SD **T1500Z**	—	—	SD **AC5015S**	—	—	—	—	SD **AC5015S**	SUMIDIA **DA1000**	SUMIBORON **BNC2115**	SUMIBORON **BN1000**
Recommended Cutting Conditions	A10~			A14~			A16~		A18~	A22~	A20~	

N·m Recommended Tightening Torque (N·m)

S-DCLN type / D-DCLN type

Medium Diameter General-purpose
Double Clamp

S-DCLN
Bottom Facing

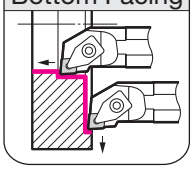


Fig 1

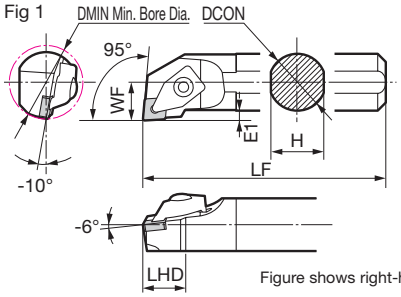


Fig 2

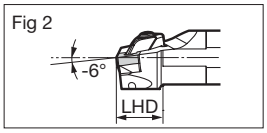


Fig 3

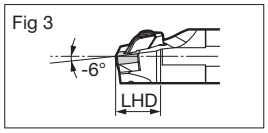


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
Steel	S25R-DCLN R/L0903-32	—	●	●	32	25	23	200	17.0	18	4.5	CN□□0903	B14	1	SCP-1	5.0	—	—	LH040	LH025
	S25T-DCLN R/L0903-32	S25T-DCLN R/L 09	●	●	32	25	23	300	17.0	18	4.5			1						
	S32S-DCLN R/L1204-40	—	●	●	40	32	30	250	22.0	26	7.0	CN□□1204	B16~	2	SCP-2	5.0	CNS1204B	BFTX0409N	LH040	LH025
	S40T-DCLN R/L1204-50	—	●	●	50	40	37	300	27.0	26	8.5			2						
	S50U-DCLN R/L1204-63	—	●	●	63	50	47	350	31.5	36	8.0			3						

Feed direction of applicable inserts differs according to machining application. (Refer to * note below)

Clamp Set Parts E82 | Smart Damper™ E15

Medium Diameter General-purpose
Double Clamp

SumiTurn X-Bar

D-DCLN
Bottom Facing

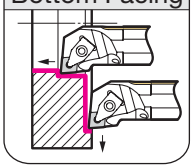


Fig 1

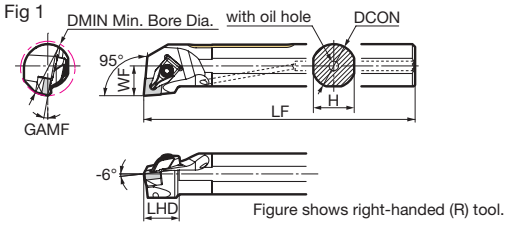


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
Steel with Anti-Vibration Mechanism and Oil Hole	D25T-DCLN R/L1204-32	●	●	32	25	23	300	17	26	-12°	CN□□1204	B16~	1	SCP-2	5.0	CNS1203B	BFTX0307N	LH040	LH025
	D32T-DCLN R/L1204-40	●	●	40	32	30	300	22	26	-10°			1			CNS1204B	BFTX0409N		
	D40U-DCLN R/L1204-50	●	●	50	40	37	350	27	26	-10°			1						

Feed direction of applicable inserts differs according to machining application. (Refer to * note below)

Clamp Set Parts E82 | Smart Damper™ E15

***Applicable Inserts for DCLN type**

For internal boring: Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts. Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

For facing: Right-handed (R) tool holders are compatible with right-handed (R) or neutral (N) inserts. Left-handed (L) tool holders are compatible with left-handed (L) or neutral (N) inserts.

Applicable Inserts ◀·· S-DCLN type / D-DCLN type / S-PCLN type / B-PCLN type / S-ECLN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo / Grade — GU / AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) High-precision Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2115	SUMIBORON BN1000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	—	SUMIBORON BNC300	SUMIBORON BN350
Recommended Cutting Conditions	A10~			A14~			A16~			A18~			A22~		A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-PCLN/B-PCLN type

Medium Diameter General-purpose
Lever Lock

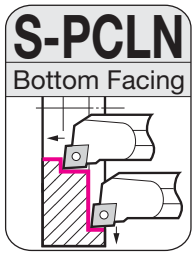


Fig 1

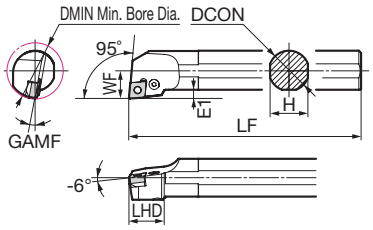


Fig 2

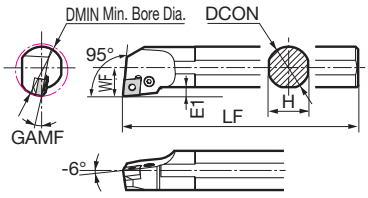


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
																				(For Hexagonal hole)
Steel	S25R-PCLN R/L0903-32	—	●	●	32	25	23	200	17.0	30	4.5	-15°	CN□□0903	B14	1	LCL3	LCS3	LSC32	LSP3	LH025
	S32S-PCLN R/L1204-40	—	●	●	40	32	30	250	22.0	29	7.0	-10°			1					
	S32S-PCLN R/L1204-44	S32S-PCLN R/L 12	▲	▲	44	32	30	250	22.0	29	7.0	-10°			1			LSC42B		
	S40T-PCLN R/L1204-50	—	●	●	50	40	37	300	25.0	29	6.5	-10°	CN□□1204	B16~	1	LCL4	LCS4		LSP4	LH030
	S40T-PCLN R/L1204-54	S40T-PCLN R/L 12	▲	▲	54	40	37	300	27.0	29	8.5	-10°			1			LSC42		
	S50U-PCLN R/L1204-63	—	●	●	63	50	47	350	31.5	—	8.0	-10°			2			LSC42B		
	S50U-PCLN R/L1906-70	S50U-PCLN R/L 19	▲	▲	70	50	47	350	35.0	39	11.5	-10°	CN□□1906	B22~	1	LCL6	LCS6	LSC63	LSP6	LH040

Feed direction of applicable inserts differs according to machining application. (Refer to * note below)

Medium Diameter General-purpose
Lever Lock

SumiTurn X-Bar

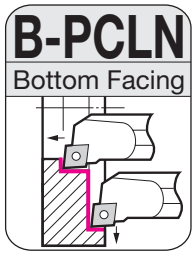


Fig 1

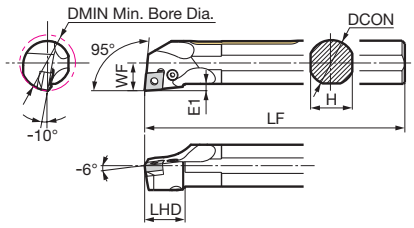


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
																		(For Hexagonal hole)
Steel with Anti-Vibration Mechanism	B32U-PCLN R/L1204-40	●		40	32	30	350	20	29	5.0	CN□□1204	B16~	1	LCL4	LCS4CA	LSC42B	LSP4	LH030
	B40W-PCLN R/L1204-50	●		50	40	37	450	25	29	6.5			1		LCS4			

Feed direction of applicable inserts differs according to machining application. (Refer to * note below)

***Applicable Inserts for PCLN type**

For internal boring: Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts. Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

For facing: Right-handed (R) tool holders are compatible with right-handed (R) or neutral (N) inserts. Left-handed (L) tool holders are compatible with left-handed (L) or neutral (N) inserts.

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S-ECLN type

Medium Diameter General-purpose
Pin Lock

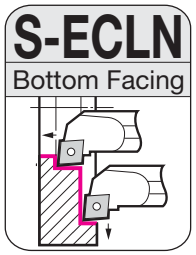


Fig 1

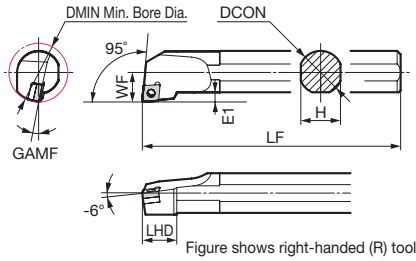


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Shim	Eccentric Pin	Wrench (For Hexagonal hole)
Steel	S20Q-ECLN R/L0903-26	BCLN320 R/L	●	●	26	20	18	180	13	20	4.0	-12°	CN□□0903	B14	1	—	CPU304C	LH030
	S25R-ECLN R/L0903-34	BCLN325 R/L	●	●	34	25	23	200	17	20	5.5	-12°			1	SCW323	CPB32C	LH025
	S25R-ECLN R/L1204-34	BCLN425 R/L	●	●	34	25	23	200	17	20	5.5	-12°			1		CPB42	
	S32S-ECLN R/L1204-44	BCLN432 R/L	●	●	44	32	30	250	22	25	7.0	-10°	CN□□1204	B16~	1	SCW423	CPB43S	LH030
	S40T-ECLN R/L1204-54	BCLN440 R/L	●		54	40	37	300	27	25	8.5	-10°			1		CPB43	
	S50U-ECLN R/L1906-70	BCLN650 R/L			70	50	47	350	35	32	11.5	-10°	CN□□1906	B22~	1	SCW635	CPB64	LH040

Feed direction of applicable inserts differs according to machining application. (Refer to * note below)

***Applicable Inserts for ECLN type**

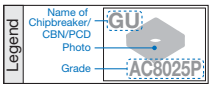
For internal boring: Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts. Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

For facing: Right-handed (R) tool holders are compatible with right-handed (R) or neutral (N) inserts. Left-handed (L) tool holders are compatible with left-handed (L) or neutral (N) inserts.

Applicable Inserts ◀·· S-DCLN type / D-DCLN type / S-PCLN type / B-PCLN type / S-ECLN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2115	SUMIBORON BN1000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	—	SUMIBORON BNC300	SUMIBORON BN350
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~		☞ A20~	

BNC500 is for ductile cast iron.

S-SDUC type / A-SDUC type

Internal Profiling
Screw-on

S-SDUC
Profiling

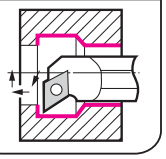


Fig 1

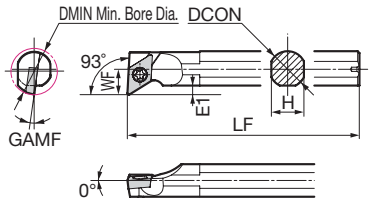


Fig 2

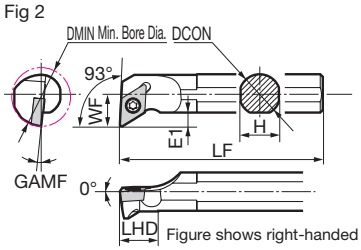


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Head LHD	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S10M-SDUC R/L0702-13**	S10M-SDUC R/L 07	●	●	**13**	10	9	150	7.0	2.5	-8°	—	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
	S12M-SDUC R/L0702-16	S12M-SDUC R/L 07	●	●	**16**	12	11	150	9.0	3.5	-8°	—			1			
	S16Q-SDUC R/L0702-20	–	●	●	**20**	16	15	180	11.0	4.0	-6°	—			1			
	S16N-SDUC R/L0702-20	S16N-SDUC R/L 07	●	●	**20**	16	15	160	11.0	4.0	-6°	—			1			
	S16Q-SDUC R/L11T3-23	–	●	●	**23**	16	15	180	12.5	5.5	-6°	15	DC□□11T3	**B84~**	2	BFTX0409N	**3.4**	TRX15
	S20R-SDUC R/L11T3-25	–	●	●	**25**	20	18	200	13.0	4.5	-6°	—			1			
	S20N-SDUC R/L11T3-25	S20N-SDUC R/L 11	●	●	**25**	20	18	160	13.0	4.5	-6°	—			1			
	S25S-SDUC R/L11T3-32	–	●	●	**32**	25	22	250	17.0	7.0	-6°	—			1			
	S25Q-SDUC R/L11T3-32	S25Q-SDUC R/L 11	●	●	**32**	25	22	180	17.0	7.0	-6°	—			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E13

Internal Profiling
Screw-on

A-SDUC
Profiling

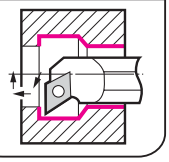


Fig 1

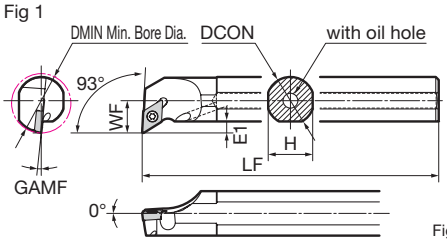


Fig 2

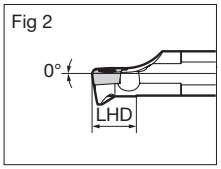


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Head LHD	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Oil Hole	**A10M-SDUC R/L0702-13**	●	●	**13**	10	9	150	7.0	2.5	-8°	—	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
	A12M-SDUC R/L0702-16	●	●	**16**	12	11	150	9.0	3.5	-8°	—			1			
	A16Q-SDUC R/L0702-20	●	●	**20**	16	15	180	11.0	4.0	-6°	—			1			
	A16Q-SDUC R/L11T3-23	●	●	**23**	16	15	180	12.5	5.5	-6°	15	DC□□11T3	**B84~**	2	BFTX0409N	**3.4**	TRX15
	A20R-SDUC R/L11T3-25	●	●	**25**	20	18	200	13.0	4.5	-6°	—			1			
	A25S-SDUC R/L11T3-32	●	●	**32**	25	22	250	17.0	7.0	-6°	—			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E13

N·m Recommended Tightening Torque (N·m)

B-SDUC type / C-SDUC type

Internal Profiling
Screw-on

B-SDUC
Profiling

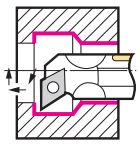


Fig 1

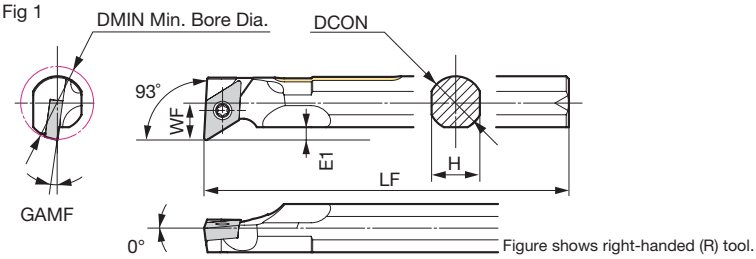


Figure shows right-handed (R) tool.

SumiTurn X-Bar

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism	**B10M-SDUC R/L0702-13**	●	●	**13**	10	9	150	7	2.5	-8°	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
	B12M-SDUC R/L0702-16	●	●	**16**	12	11	150	9	3.5	-8°			1			
	B16R-SDUC R/L0702-20	●	●	**20**	16	15	200	11	4.0	-6°			1			
	B20S-SDUC R/L11T3-25	●	●	**25**	20	18	250	13	4.5	-6°	DC□□11T3	**B84~**	1	BFTX0409N	**3.4**	TRX15
	B25S-SDUC R/L11T3-32	●	●	**32**	25	22	250	17	7.0	-6°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E13

Internal Profiling
Screw-on

C-SDUC
Profiling

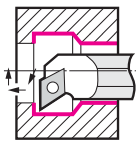


Fig 1

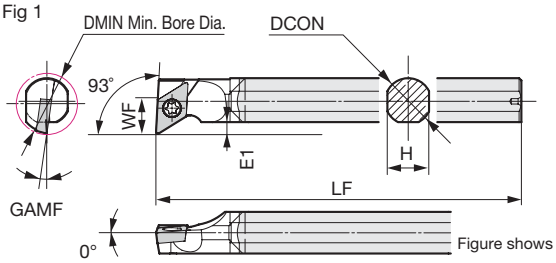


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Carbide	**C10M-SDUC R/L0702-13**	●	●	**13**	10	9	150	7	2.5	-8°	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
	C12M-SDUC R/L0702-16	●	●	**16**	12	11	150	9	3.5	-8°			1			
	C16R-SDUC R/L0702-20	●	●	**20**	16	15	200	11	4.0	-6°			1			
	C20S-SDUC R/L11T3-25	●	●	**25**	20	18	250	13	4.5	-6°	DC□□11T3	**B84~**	1	BFTX0409N	**3.4**	TRX15

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

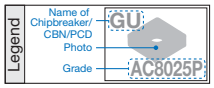
Smart Damper™ E13

Applicable Inserts

S-SDUC type / A-SDUC type / B-SDUC type / C-SDUC type / S-SDQC type / A-SDQC type / B-SDQC type / S-SDZC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6030M	SUMIBORON BN7125/BNC500	MU AC4015K	No Chipbreaker AC4015K	FX AC5015S	SUMIDIA DA1000	AG H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FF AC1030U	SI AC1030U	SC AC1030U	FF AC1030U	SI AC1030U	SC AC1030U	SUMIBORON BN7125/BNC500	–	–	SI AC5015S	SUMIDIA DA1000	–	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	A10~			A14~			A16~			A18~	A22~		A20~		M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-SDQC type / A-SDQC type

Internal Profiling
Screw-on

S-SDQC
Profiling

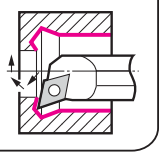


Fig 1

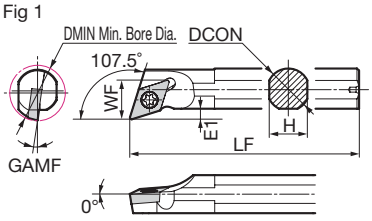


Fig 2

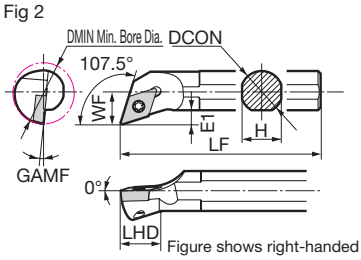


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Head LHD	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S10M-SDQC R/L0702-13**	S10M-SDQC R/L 07	●	●	**13**	10	9	150	7.0	2.5	-8°	—	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
	S12M-SDQC R/L0702-16	S12M-SDQC R/L 07	●	●	**16**	12	11	150	9.0	3.5	-8°	—			1			
	S16Q-SDQC R/L0702-20	—	●	●	**20**	16	15	180	11.0	4.0	-6°	—			1			
	S16N-SDQC R/L0702-20	S16N-SDQC R/L 07	●	●	**20**	16	15	160	11.0	4.0	-6°	—			1			
	S16Q-SDQC R/L11T3-23	—	●	●	**23**	16	15	180	12.5	5.5	-6°	15	DC□□11T3	**B84~**	2	BFTX0409N	**3.4**	TRX15
	S20R-SDQC R/L11T3-25	—	●	●	**25**	20	18	200	13.0	4.5	-6°	—			1			
	S20N-SDQC R/L11T3-25	S20N-SDQC R/L 11	●	●	**25**	20	18	160	13.0	4.5	-6°	—			1			
	S25S-SDQC R/L11T3-32	—	●	●	**32**	25	22	250	17.0	7.0	-6°	—			1			
	S25Q-SDQC R/L11T3-32	S25Q-SDQC R/L 11	●	●	**32**	25	22	180	17.0	7.0	-6°	—			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E13

Internal Profiling
Screw-on

A-SDQC
Profiling

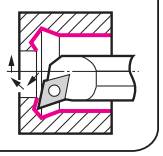


Fig 1

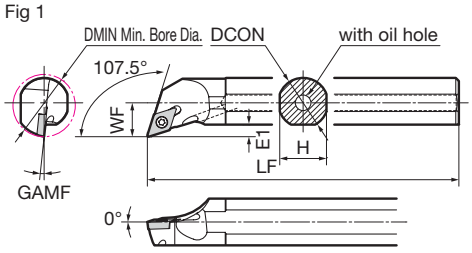


Fig 2

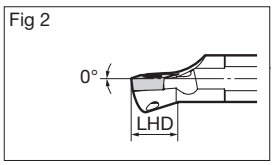


Figure shows right-handed (R) tool.

Holder

Parts Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Head LHD	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Oil Hole	**A10M-SDQC R/L0702-13**	●	●	**13**	10	9	150	7.0	2.5	-8°	—	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
	A12M-SDQC R/L0702-16	●	●	**16**	12	11	150	9.0	3.5	-8°	—			1			
	A16Q-SDQC R/L0702-20	●	●	**20**	16	15	180	11.0	4.0	-6°	—			1			
	A16Q-SDQC R/L11T3-23	●	●	**23**	16	15	180	12.5	5.5	-6°	15	DC□□11T3	**B84~**	2	BFTX0409N	**3.4**	TRX15
	A20R-SDQC R/L11T3-25	●	●	**25**	20	18	200	13.0	4.5	-6°	—			1			
	A25S-SDQC R/L11T3-32	●	●	**32**	25	22	250	17.0	7.0	-6°	—			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E13

N·m Recommended Tightening Torque (N·m)

B-SDQC type

Internal Profiling
Screw-on

B-SDQC
Profiling

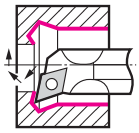


Fig 1

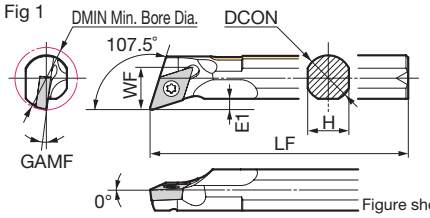


Figure shows right-handed (R) tool.

SumiTurn X-Bar
SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism	**B10M-SDQC R/L0702-13**	●	●	**13**	10	9	150	7	2.5	-8°	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
	B12M-SDQC R/L0702-16	●	●	**16**	12	11	150	9	3.5	-8°			1			
	B16R-SDQC R/L0702-20	●	●	**20**	16	15	200	11	4.0	-6°			1			
	B20S-SDQC R/L11T3-25	●	●	**25**	20	18	250	13	4.5	-6°	DC□□11T3	**B84~**	1	BFTX0409N	**3.4**	TRX15
	B25S-SDQC R/L11T3-32	●	●	**32**	25	22	250	17	7.0	-6°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

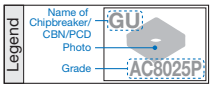
Smart Damper™ E13

Applicable Inserts

S-SDUC type / A-SDUC type / B-SDUC type / C-SDUC type / S-SDQC type / A-SDQC type / B-SDQC type / S-SDZC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6030M	SUMIBORON BN7125/BNC500	MU AC4015K	No Chipbreaker AC4015K	FX AC5015S	SUMIDIA DA1000	AG H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FF AC1030U	SI AC1030U	SC AC1030U	FF AC1030U	SI AC1030U	SC AC1030U	SUMIBORON BN7125/BNC500	—	—	SI AC5015S	SUMIDIA DA1000	—	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	A10~			A14~			A16~			A18~	A22~		A20~		M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-SDZC type

Internal Profiling
Screw-on

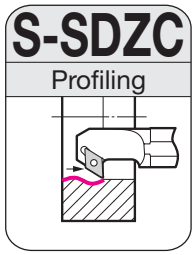


Fig 1

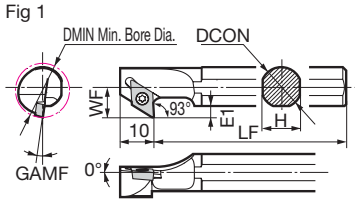


Fig 2

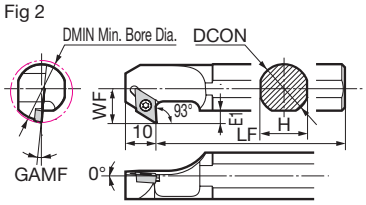


Fig 3

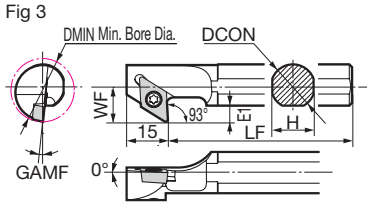


Fig 4

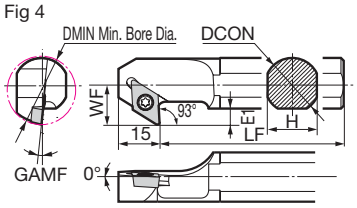


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S10M-SDZC R/L0702-13**	●	●	**13**	10	9	150	7.5	3.0	-8°	DC□□0702	**B80~**	1	BFTX02506N	**1.5**	TRX08
	S12M-SDZC R/L0702-16	●	●	**16**	12	11	150	9.0	3.5	-8°			1			
	S16Q-SDZC R/L0702-20	●	●	**20**	16	15	180	11.0	4.0	-6°			2			
	S16Q-SDZC R/L11T3-23	●	●	**23**	16	15	180	13.0	6.0	-6°	DC□□11T3	**B84~**	3	BFTX0409N	**3.4**	TRX15
	S20R-SDZC R/L11T3-25	●	●	**25**	20	18	200	14.5	6.0	-6°			4			
	S25S-SDZC R/L11T3-32	●	●	**32**	25	22	250	17.0	7.0	-6°			4			

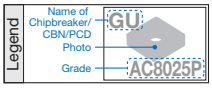
Right-handed (R) tool holders are compatible with right-handed (R) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with left-handed (L) or neutral (N) inserts.

Applicable Inserts

S-SDUC type / A-SDUC type / B-SDUC type / C-SDUC type / S-SDQC type / A-SDQC type / B-SDQC type / S-SDZC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material —
General Machining	FB **T1500Z**	GU **AC8025P**	MU **AC8025P**	LB **AC6030M**	GU **AC6030M**	MU **AC6030M**	SUMIBORON BN7125/BNC500	MU **AC4015K**	No Chipbreaker **AC4015K**	FX **AC5015S**	SUMIDIA **DA1000**	AG **H1**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**	SUMIDIA **DA90**
High-precision	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	FF **AC1030U**	SI **AC1030U**	SC **AC1030U**	SUMIBORON BN7125/BNC500	–	–	SI **AC5015S**	SUMIDIA **DA1000**	–	SUMIBORON **BNC2115**	SUMIBORON **BN1000**	SUMIDIA BINDERLESS **NPD10**
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~	☞ A22~		☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-DDQN type / S-DDUN type

Profiling
Double Clamp

S-DDQN
Profiling

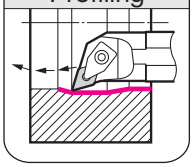


Fig 1

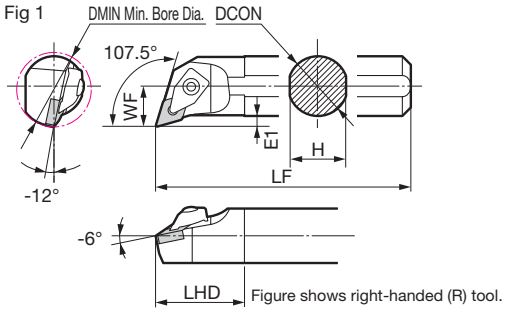


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Top Hex Wrench	Bottom Hex Wrench
Steel	**S32T-DDQN R/L1504-40**	S32T-DDQNL15	●	●	**40**	32	30	300	22	48	6	DN□□1504	**B26~**	1	SCP-2	**5.0**	LH040 (For Hexagonal hole)	LH025 (For Hexagonal hole)

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Clamp Set Parts ☞ E82

Profiling
Double Clamp

S-DDUN
Profiling

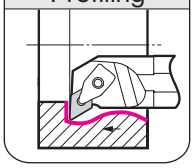


Fig 1

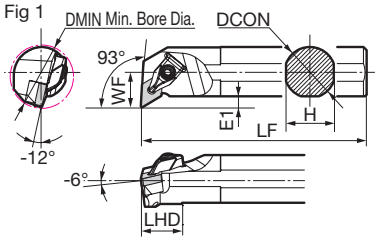


Fig 2

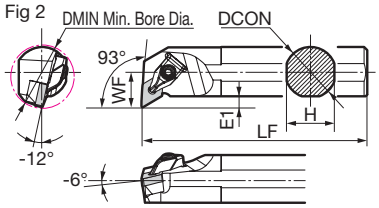


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench	Bottom Hex Wrench
Steel	**S32S-DDUN R/L1504-40**	●	●	**40**	32	30	250	22.0	26	7.0	DN□□1504	**B26~**	1	SCP-2	**5.0**	DNS1504B	BFTX0409N	LH040 (For Hexagonal hole)	LH025 (For Hexagonal hole)
	S40T-DDUN R/L1504-50	●	●	**50**	40	37	300	27.0	26	8.5			1						
	S50U-DDUN R/L1504-63	●	●	**63**	50	47	350	31.5	—	8.0			2						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
Modification of the holder and shim is required when using inserts with corner radius of 1.6 or larger, in order to prevent interference with the workpiece.

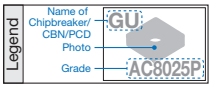
Clamp Set Parts ☞ E82

Smart Damper™ ☞ E15

Applicable Inserts ◂·· S-DDQN type / S-DDUN type / D-DDUN type / S-PDUN type / S-EDUN type / S-PDZN type / S-EDZN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	AX H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	–	SUMIBORON BNC300	SUMIBORON BN350	–
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~		☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

D-DDUN type / S-PDUN type / S-EDUN type

D-DDUN Profiling

Profiling
Double Clamp

SumiTurn X-Bar

Fig 1

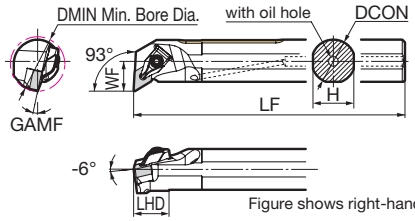


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench	Bottom Hex Wrench
Steel with Anti-Vibration Mechanism and Coolant Hole	**D32T-DDUN R/L1104-40**	●	●	**40**	32	30	300	22	26	-10°	DN□□1104	**B25~**	1	SCP-1	**5.0**	DNS1104B	BFTX0307N	LH040 (For Hexagonal hole)	LH025 (For Hexagonal hole)
	D32T-DDUN R/L1506-40	●	●	**40**	32	30	300	22	26	-12°	DN□□1506	**B30~**	1	SCP-2	**5.0**	DNS1506B	BFTX0409N	LH040	LH025
	D40U-DDUN R/L1506-50	●	●	**50**	40	37	350	27	26	-12°			1						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Clamp Set Parts E82

Smart Damper™ E15

S-PDUN Profiling

Profiling
Lever Lock

Fig 1

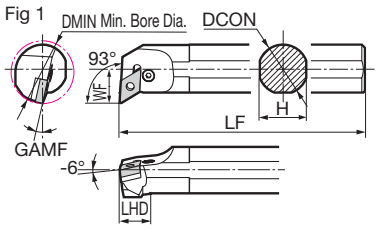


Fig 2

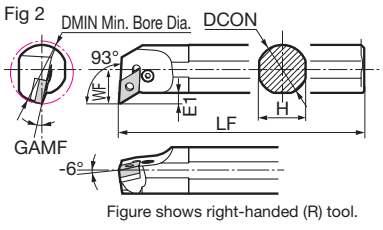


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
Steel	**S25R-PDUN R/L1104-32**	—	●	●	**32**	25	22	200	17.0	20	7.0	-15°	DN□□1104	**B25~**	1	LCL3	LCS3	LSD317	LSP3	LH025 (For Hexagonal hole)
	S32S-PDUN R/L1504-40	—	●	●	**40**	32	30	250	22.0	20	7.0	-12°	DN□□1504	**B26~**	1	LCL4	LCS4	LSD42	LSP4	LH030
	S32S-PDUN R/L1504-44	S32S-PDUN R/L 15	▲	▲	**44**	32	30	250	22.0	20	7.0	-10°			1					
	S40T-PDUN R/L1504-50	—	●	●	**50**	40	37	300	27.0	20	8.5	-12°			1					
	S50U-PDUN R/L1504-63	—	●	●	**63**	50	47	350	31.5	—	8.0	-12°			2					

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

S-EDUN Profiling

Profiling
Pin Lock

Fig 1

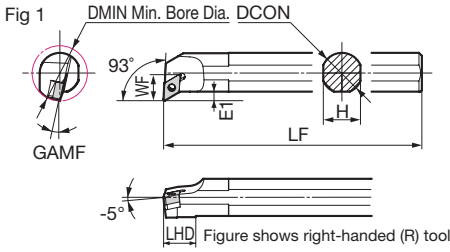


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Shim	Eccentric Pin	Wrench
Steel	**S25R-EDUN R/L1104-34**	BDUN325 R/L	●		**34**	25	23	200	17	20	5.5	-12°	DN□□1104	**B25~**	1	SDW323	CPB34	LH025 (For Hexagonal hole)
	S32S-EDUN R/L1504-44	BDUN432 R/L	●		**44**	32	30	250	22	20	7.0	-10°	DN□□1504	**B26~**	1	SDW423	CPB43	LH030

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S-PDZN type / S-EDZN type

Profiling
Lever Lock

S-PDZN
Profiling

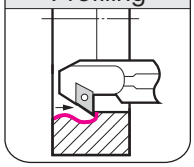


Fig 1

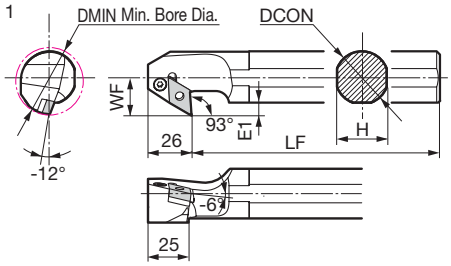


Fig 2

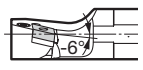
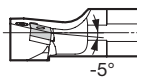


Fig 3



Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
Steel	**S32S-PDZN R/L1504-40**	—	●	●	**40**	32	30	250	22.0	7.0	DN□□1504	**B26~**	2	LCL4	LCS4	LSD42	LSP4	LH030
	S32S-PDZN R/L1504-44	S32S-PDZN R/L 15	▲	▲	**44**	32	30	250	22.0	7.0			1					
	S40T-PDZN R/L1504-50	—	●	●	**50**	40	37	300	27.0	8.5			2					
	S50U-PDZN R/L1504-63	—	●	●	**63**	50	47	350	31.5	8.0			3					

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Profiling
Pin Lock

S-EDZN
Profiling

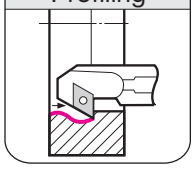


Fig 1

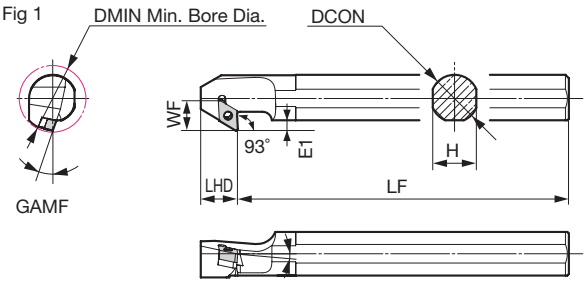


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

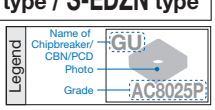
Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Head LHD	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Shim	Eccentric Pin	Wrench
Steel	**S25R-EDZN R/L1104-34**	BDZN325 R/L	●		**34**	25	23	200	20	17	5.5	-12°	DN□□1104	**B25~**	1	SDW323	CPB34	LH025
	S32S-EDZN R/L1504-44	BDZN432 R/L	●		**44**	32	30	250	25	22	7.0	-10°	DN□□1504	**B26~**	1	SDW423	CPB43	LH030

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◀·· S-DDQN type / S-DDUN type / D-DDUN type / S-PDUN type / S-EDUN type / S-PDZN type / S-EDZN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	**FE** **T1500Z**	**GU** **AC8015P**	**MU** **AC8025P**	**EF** **AC6020M**	**EG** **AC6020M**	**EM** **AC6030M**	**SUMIBORON** BN7125/BNC500	**UZ** **AC4010K**	**GZ** **AC4010K**	**EF** **AC5015S**	**EG** **AC5015S**	**EM** **AC5015S**	**SUMIDIA** **DA1000**	**AX** **H1**	**SUMIBORON** **BNC2115**	**SUMIBORON** **BN1000**	**SUMIDIA BINDERLESS** **NPD10**
General Machining	**SU** **AC8015P**	**GU** **AC8025P**	**MU** **AC8025P**	**EF** **AC6030M**	**EG** **AC6030M**	**EM** **AC6040M**	**SUMIBORON** BN7125/BNC500	**GZ** **AC4015K**	**GZ** **AC4015K**	**EF** **AC5015S**	**EG** **AC5015S**	**EM** **AC5025S**	**SUMIDIA** **DA1000**	**AX** **H1**	**SUMIBORON** **BNC2125**	**SUMIBORON** **BN2000**	**SUMIDIA** **DA90**
Interrupted Cutting	**SX** **AC8025P**	**UX** **AC8035P**	**MX** **AC8035P**	**EF** **AC6030M**	**EG** **AC6040M**	**EM** **AC6040M**	**SUMIBORON** BN7125/BNC500	**GZ** **AC420K**	**No Chipbreaker** **AC420K**	**EF** **AC5025S**	**EG** **AC5025S**	**EM** **AC5025S**	**SUMIDIA** **DA1000**	—	**SUMIBORON** **BNC300**	**SUMIBORON** **BN350**	—
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~		☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S-DTR55C type

Steel

Internal Profiling
Double Clamp

SumiTurn T-REX

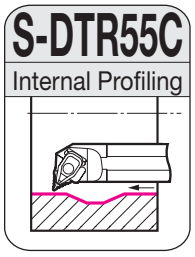
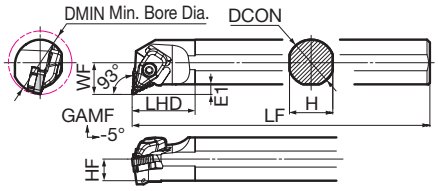


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Min. Bore Dia.	Diameter	Height	Overall Length	Cutting Edge Distance	Head	Rake Angle	Offset	Cutting Edge Height	Fig	Clamp Plate	Spring	Cap Screw		Shim	Shim Screw	Wrench	Wrench for Shim
	R	DMIN	DCON	H	LF	WF	LHD	GAMF	E1	HF					N·m			(For Hexagonal hole)	(For Torx hole)
S32S-DTR55C R-17	●	**44**	32	30	250	22	42	-12°	7.0	15.0	1	TRCP3	S-SP4-20	BX0520	3.5 to 4.5	TRW5505	BFTX0307N	TSW040	TRX10(*)
S40T-DTR55C R-17	●	**50**	40	37	300	25	42	-10°	6.2	18.5	1								

* Item is sold separately.

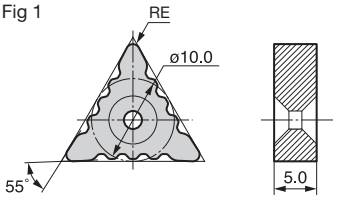
DTR55C type: External Profiling C17

Insert (Coated Carbide / Cermet)

Dimensions (mm)

Applications	Appearance	Cat. No.	Corner Radius RE	AC810P	AC8025P	AC820P	AC830P	AC630M	T3000Z	Fig
Fine Cutting	FL	**TRM 551704-FL**	0.4		●	●			▲	1
		551708-FL	0.8		●	●			▲	1
Finishing	LU	**TRM 551704-LU**	0.4	●	●	●	●		▲	1
		551708-LU	0.8	●	●	●	●		▲	1
		551712-LU	1.2	●	●	●	●		▲	1
	SU	**TRM 551704-SU**	0.4	●	●	●		●	▲	1
		551708-SU	0.8	●	●	●		●	▲	1
		551712-SU	1.2	●	●	●		●	▲	1
Medium Cutting	GU	**TRM 551704-GU**	0.4	●	●	●	●	●		1
		551708-GU	0.8	●	●	●	●	●		1
		551712-GU	1.2	●	●	●	●	●		1

Fig 1



N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

MEMO

S-SSKP type/C-SSKP type

Internal General-purpose
Screw-on

SumiSmall

S-SSKP
Through Boring

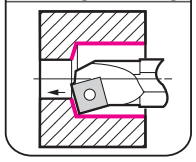


Fig 1

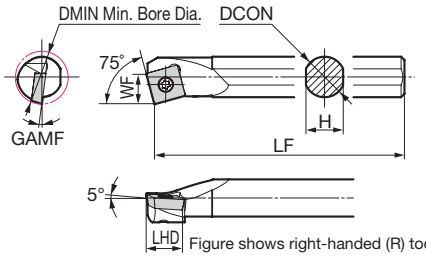


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S12M-SSKP R/L0903-16**	BBPS-312 R/L	●	●	**16**	12	11	150	8.0	9.0	-6°	SP□□0903	**B94**	1	BFTX0307A	**2.0**	TRX10
	S16R-SSKP R/L0903-20	BBPS-316 R/L	●	●	**20**	16	15	200	10.0	6.8	-4°			1			
	S20S-SSKP R/L0903-25	BBPS-320 R/L	●	●	**25**	20	18	250	12.5	8.5	-2°			1			
	S25T-SSKP R/L0903-28	BBPS-325 R/L	●	●	**28**	25	22	300	14.0	5.0	0°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Internal General-purpose
Screw-on

SumiSmall

C-SSKP
Through Boring

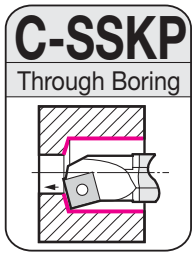
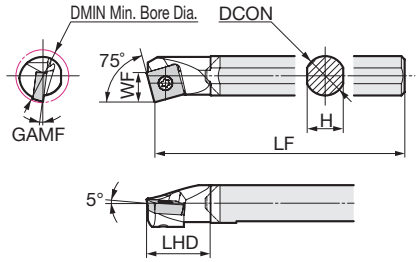


Fig 1



Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Carbide Standard	**C12M-SSKP R0903-16**	WBPS-312RS	●	**16**	12	11	150	8	25	-6°	SP□□0903	**B94**	1	BFTX0307A	**2.0**	TRX10
Carbide Long	**C12R-SSKP R0903-16**	WBPS-312R	●	**16**	12	11	200	8	25	-6°			1	BFTX0307A	**2.0**	TRX10
	C16S-SSKP R0903-20	WBPS-316R	●	**20**	16	15	250	10	30	-4°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.

Applicable Inserts ◂·· S-SSKP type/C-SSKP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/CBN/PCD Photo — GU; Grade — AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	N (Non-Ferrous)
General Machining	FB T1500Z	LB AC8025P	LU AC6030M	LB AC6030M	SUMIDIA DA1000
High-precision	SD T1500Z	—	—	—	SUMIDIA DA1000
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A22~

N·m Recommended Tightening Torque (N·m)

S-CSKP type

Internal General-purpose
Clamp-on

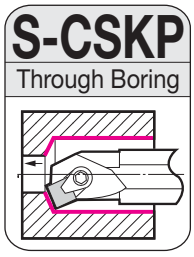


Fig 1

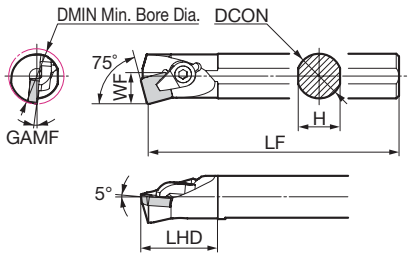


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Plate	Double Screw	Wrench
Steel	**S16Q-CSKP R/L0903-20**	S16Q-CSKP R/L 09	●	●	**20**	16	15	180	10.0	28	-4°	SP□□0903	**B96**	1	CCM6B L/R	WB6-10	LH030
	S20R-CSKP R/L0903-25	S20R-CSKP R/L 09	●	●	**25**	20	18	200	12.5	28	-2°			1		WB6-13	

(For Hexagonal hole)

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◀·· S-CSKP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo — GU; Grade — AC8025P

Application Range / Process	P (Steel)		K (Cast Iron)			S (Exotic Alloy)		H (Hardened Steel)
	Finishing	Medium Cutting	High-speed Finishing	Finishing to Medium Cutting	Medium to Roughing	Finishing to Medium Cutting	Medium to Roughing	Uncoated
General Machining	FK T1500Z	SF AC8025P	SUMIBORON BN7125	No Chipbreaker AC4015K	No Chipbreaker AC4015K	No Chipbreaker AC5015S	No Chipbreaker AC5025S	SUMIBORON BN2000
Recommended Cutting Conditions	☞ A10~		☞ A16~			☞ A18~		☞ A20~

11° inserts with holes can also be used.

S-SSKC type

Internal General-purpose
Screw-on

SumiSmall

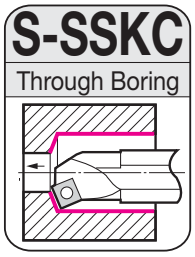


Fig 1

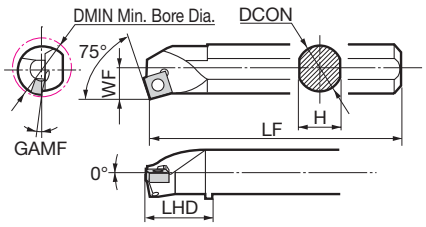


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench
Steel	**S16R-SSKC R/L09T3-20**	S16R-SSKC R/L 09	●	●	**20**	16	15	200	11	23	-10°	SC□□09T3	**B91**	1	BFTX0407N	**3.4**	TRX15 (For Torx hole)
	S20S-SSKC R/L09T3-25	S20S-SSKC R/L 09	●	●	**25**	20	18	250	13	27	-8°			1	BFTX0409N	**3.4**	
	S25T-SSKC R/L1204-32	S25T-SSKC R/L 12	●		**32**	25	23	300	17	30	-7°	SC□□1204	**B92**	1	BFTX0511N	**5.0**	TRX20
	S32U-SSKC R/L1204-40	S32U-SSKC R/L 12	●		**40**	32	30	350	22	33	-6°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◂·· S-SSKC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD → GU; Photo; Grade → AC8025P

Application / Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	N (Non-Ferrous)
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6040M	MU AC4015K	No Chipbreaker AC4015K	SUMIDIA DA1000
High-precision	FX T1500A	SC AC1030U	SC AC1030U	FX AC1030U	SC AC1030U	SC AC1030U	—	—	SUMIDIA DA1000
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~		☞ A22~

N·m Recommended Tightening Torque (N·m)

S-DSKN type / S-PSKN type

Medium Diameter General-purpose
Double Clamp

S-DSKN
Through Boring

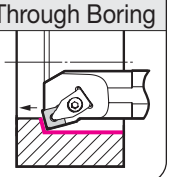


Fig 1

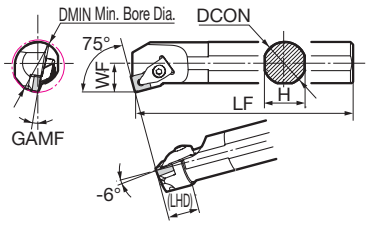


Fig 2

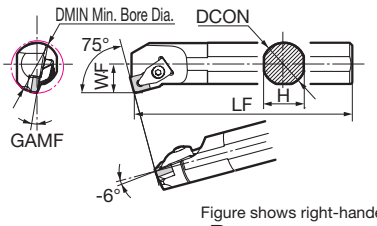


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
Steel	S25R-DSKN R/L1204-32	●	●	32	25	23	200	17.0	(26)	-13°	SN□□1204	B35~	1	SCP-2	5.0	SNS1203B	BFTX0307N	LH040	LH025
	S32S-DSKN R/L1204-40	●	●	40	32	30	250	22.0	(21)	-10°			1						
	S40T-DSKN R/L1204-50	●	●	50	40	37	300	27.0	(21)	-10°			1						
	S50U-DSKN R/L1204-63	●	●	63	50	47	350	31.5	—	-10°			2						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
( ) is a reference value.

Clamp Set Parts E82

Medium Diameter General-purpose
Lever Lock

S-PSKN
Through Boring

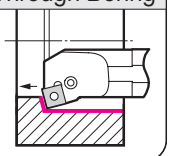


Fig 1

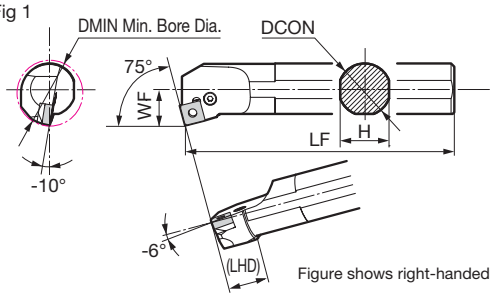


Fig 2

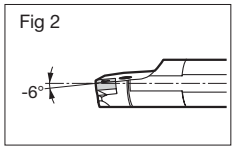


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
Steel	S32S-PSKN R/L1204-40	—	●	●	40	32	30	250	22.0	(21)			1					
	S32S-PSKN R/L1204-44	S32S-PSKN R/L 12	▲	▲	44	32	30	250	22.0	(21)			1			LSS42B		
	S40T-PSKN R/L1204-50	—	●	●	50	40	37	300	27.0	(21)	SN□□1204	B35~	1	LCL4	LCS4		LSP4	LH030
	S40T-PSKN R/L1204-54	S40T-PSKN R/L 12	▲	▲	54	40	37	300	27.0	(21)			1			LSS42		
	S50U-PSKN R/L1204-63	—	●	●	63	50	47	350	31.5	—			2			LSS42B		
	S50U-PSKN R/L1906-70	S50U-PSKN R/L 19	▲	▲	70	50	47	350	35.0	(31)	SN□□1906	B41~	1	LCL6	LCS6	LSS63	LSP6	LH040

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
( ) is a reference value.

Applicable Inserts ◂·· S-DSKN type / S-PSKN type / S-ESKN type / S-PSYN type / S-ESYN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo / Grade — GU / AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN350	–
Recommended Cutting Conditions	A10~			A14~			A16~			A18~			A20~		M2~

BNC500 is for ductile cast iron.

(N·m) Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S-ESKN type/S-PSYN type

Medium Diameter General-purpose
Pin Lock

Fig 1

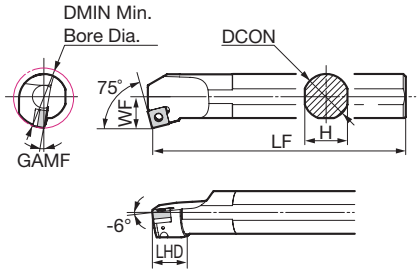


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Shim	Eccentric Pin	Wrench
Steel	**S25R-ESKN R/L1204-34**	BSKN425 R/L	●		**34**	25	23	200	17	(18)	-12°	SN□□1204	**B35~**	1	SSW423	CPB42	LH030
	S32S-ESKN R/L1204-44	BSKN432 R/L	●		**44**	32	30	250	22	(20)	-10°			1		CPB43S	
	S40T-ESKN R/L1204-54	BSKN440 R/L			**54**	40	37	300	27	(20)	-10°			1		CPB43	
	S50U-ESKN R/L1906-70	BSKN650 R/L			**70**	50	47	350	35	(30)	-10°	SN□□1906	**B41~**	1	SSW635	CPB64	LH040

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
The LHD ( ) is a reference value.

Medium Diameter General-purpose
Lever Lock

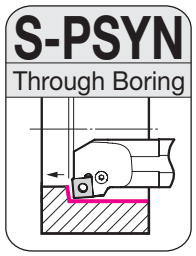


Fig 1

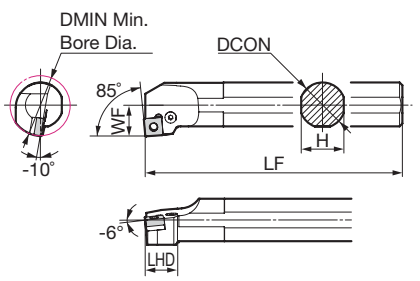


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
Steel	**S32S-PSYN R/L1204-44**	S32S-PSYN R/L 12	●	●	**44**	32	30	250	22	(22)	SN□□1204	**B35~**	1	LCL4	LCS4	LSS42B	LSP4	LH030

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
The LHD ( ) is a reference value.

S-ESYN type

Medium Diameter General-purpose
Pin Lock

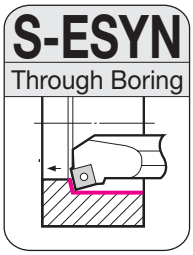


Fig 1

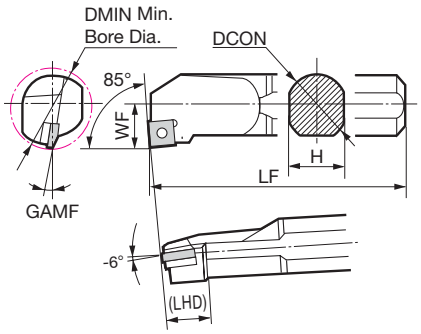


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

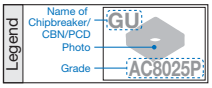
Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Shim	Eccentric Pin	Wrench
Steel	**S25R-ESYN R/L1204-34**	BSYN425 R/L			**34**	25	23	200	17	(20)	-12°	SN□□1204	**B35~**	1	SSW423	CPB42	LH030 (For Hexagonal hole)
	S32S-ESYN R/L1204-44	BSYN432 R/L			**44**	32	30	250	22	(22)	-10°			1		CPB43S	

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
The LHD ( ) is a reference value.

Applicable Inserts ◀·· S-DSKN type/S-PSKN type/S-ESKN type/S-PSYN type/S-ESYN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material Finishing
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN350	—
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A20~		☞ M2~

BNC500 is for ductile cast iron.

S-STUB type/S-STUP type/A-STUP type

T 60° | 93° | Steel

Internal Finishing to Medium Cutting
Screw-on

S-STUB S-STUP
Stop Boring

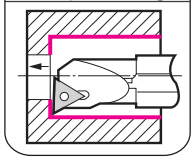


Fig 1

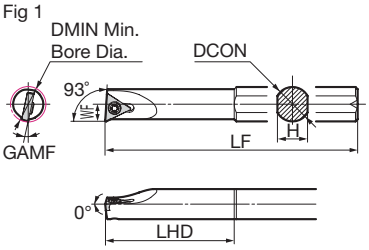


Fig 2

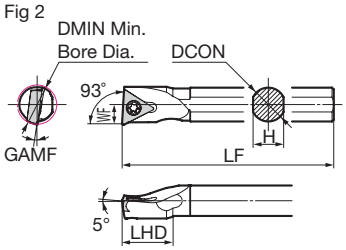


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S08H-STUB R/L0601-08**	BBPT-508 R/L	●	●	**8**	8	7	100	4.0	30	-12°	TB□□0601	**B100~**	1	BFTX0204A	0.5	TRX06
	S08H-STUP R/L0802-10	BBPT-608 R/L	●	●	**10**	8	7	100	5.0	13	-10°	TP□□0802	**B105~**	1	BFTX0204A	0.5	TRX06
	S08H-STUP R/L0902-10	—	●	●	**10**	8	7	100	5.0	13	-10°	TP□□0902	**B107**	2	BFTX02505N	1.1	TRX08
	S10K-STUP R/L1103-12	BBPT-210 R/L	●	●	**12**	10	9	125	6.0	15	-8°	TP□□1103	**B109~**	2	BFTX0306A	2.0	TRX10
	S12M-STUP R/L1103-14	BBPT-212 R/L 14	●	●	**14**	12	11	150	7.0	17	-7°			2			
	S12M-STUP R/L1103-16	BBPT-212 R/L	●	●	**16**	12	11	150	8.0	17	-6°			2	BFTX0307A	2.0	
	S16R-STUP R/L1103-18	BBPT-216 R/L 18	●	●	**18**	16	15	200	9.0	18	-4°			2	BFTX0306A	2.0	
	S16R-STUP R/L1103-20	BBPT-216 R/L	●	●	**20**	16	15	200	10.0	18	-2°			2	BFTX0307A	2.0	
	S20S-STUP R/L1103-22	BBPT-220 R/L	●	●	**22**	20	18	250	11.0	18	-2°			2			
	S25T-STUP R/L1103-28	BBPT-225 R/L	●	●	**28**	25	22	300	14.0	27	-2°			2			
	S20S-STUP R/L1603-22	—	●	●	**22**	20	18	250	11.0	18	-3°	TP□□1603	**B111**	2	BFTX0407A	3.4	TRX15
	S25T-STUP R/L1603-28	—	●	●	**28**	25	22	300	14.0	18	-1°			2			
	S20S-STUP R/L1604-22	—	●	●	**22**	20	18	250	12.5	18	-5°	TP□□1604	**B112**	2	BFTX0409N	3.4	TRX15
	S25T-STUP R/L1604-28	BBPT-325 R/L	●	●	**28**	25	22	300	14.0	18	-2°			2	BFTX0410A	3.4	

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E14

T 60° | 93° | Steel Coolant Hole

Internal Finishing to Medium Cutting
Screw-on

A-STUP
Stop Boring

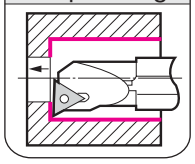


Fig 1

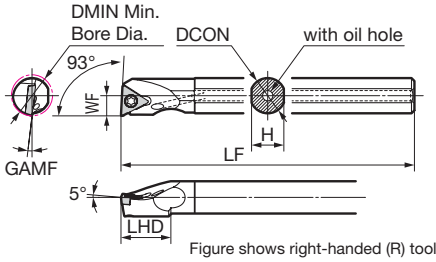


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Oil Hole	**A08H-STUP R/L0802-10**	●	●	**10**	8	7	100	5	13	-10°	TP□□0802	**B105~**	1	BFTX0204N	0.5	TRX06
	A08H-STUP R/L0902-10	●	●	**10**	8	7	100	5	13	-10°	TP□□0902	**B107**	1	BFTX02505N	1.1	TRX08
	A10K-STUP R/L1102-12	●	●	**12**	10	9	125	6	15	-8°	TP□□1102	**B108**	1	BFTX02505N	1.1	TRX08
	A12M-STUP R/L1102-14	●	●	**14**	12	11	150	7	17	-7°			1	BFTX02506N	1.5	
	A16R-STUP R/L1102-18	●	●	**18**	16	15	200	9	18	-4°			1			
	A10K-STUP R/L1103-12	●	●	**12**	10	9	125	6	15	-8°	TP□□1103	**B109~**	1	BFTX0306N	2.0	TRX10
	A12M-STUP R/L1103-14	●	●	**14**	12	11	150	7	17	-7°			1			
	A16R-STUP R/L1103-18	●	●	**18**	16	15	200	9	18	-4°			1			
	A20S-STUP R/L1103-22	●	●	**22**	20	18	250	11	18	-2°			1	BFTX0307N	2.0	
	A25T-STUP R/L1103-28	●	●	**28**	25	22	300	14	18	-2°			1			
	A20S-STUP R/L1603-22	●	●	**22**	20	18	250	11	18	-3°	TP□□1603	**B111**	1	BFTX0407N	2.0	TRX15
	A25T-STUP R/L1603-28	●	●	**28**	25	22	300	14	18	-1°			1			
	A20S-STUP R/L1604-22	●	●	**22**	20	18	250	11	18	-5°	TP□□1604	**B112**	1	BFTX0409N	3.4	TRX15
	A25T-STUP R/L1604-28	●	●	**28**	25	22	300	14	18	-2°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

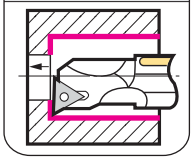
Smart Damper™ E14

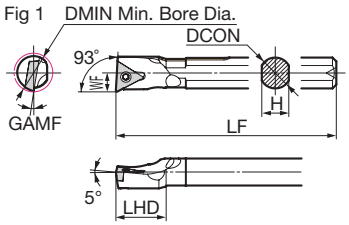
N·m Recommended Tightening Torque (N·m)

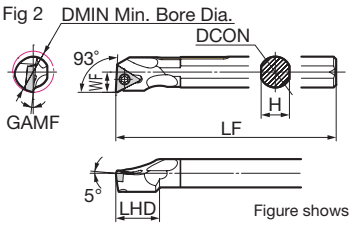
B-STUP type

Internal Finishing to Medium Cutting
Screw-on

B-STUP
Stop Boring







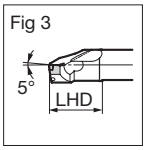


Figure shows right-handed (R) tool.

SumiTurn X-Bar
SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism	B08H-STUP R/L0802-10	XBPT-608 R/L	●	●	10	8	7	100	5.0	13	-10°	TP□□0802	B105~	1	BFTX0204A	0.5	TRX06
	B10K-STUP R/L1103-12	XBPT-210 R/L	●	●	12	10	9	125	6.0	15	-8°	TP□□1103	B109~	1	BFTX0306A	2.0	TRX10
	B12M-STUP R/L1103-14	XBPT-212 R/L 14	●	●	14	12	11	150	7.0	17	-7°			2			
	B12M-STUP R/L1103-16	XBPT-212 R/L	●	●	16	12	11	150	8.0	17	-6°			2	BFTX0307A	2.0	
	B16R-STUP R/L1103-18	XBPT-216 R/L 18	●	●	18	16	15	200	9.0	18	-4°			2	BFTX0306A	2.0	
	B16R-STUP R/L1103-20	XBPT-216 R/L	●	●	20	16	15	200	10.0	18	-2°			2			
	B20S-STUP R/L1103-22	XBPT-220 R/L	●	●	22	20	18	250	11.0	18	-2°			2	BFTX0307A	2.0	
	B25T-STUP R/L1103-28	XBPT-225 R/L	●	●	28	25	22	300	14.0	18	-2°			2			
	B32T-STUP R/L1103-40	XBPT-232 R/L	●	●	40	32	30	300	20.0	53	-2°			3			
	B20S-STUP R/L1604-25	XBPT-320 R/L	●	●	25	20	18	250	12.5	18	-3°	TP□□1604	B112	2	BFTX0410A	3.4	TRX15
	B25T-STUP R/L1604-28	XBPT-325 R/L	●	●	28	25	22	300	14.0	18	-2°			2			
	B32T-STUP R/L1604-40	XBPT-332 R/L	●	●	40	32	30	300	20.0	53	-2°			3			

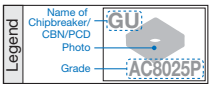
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E14

Applicable Inserts ◂·· S-STUB type/C-STUB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

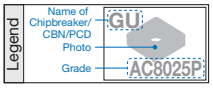


Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	N (Non-Ferrous)	H (Hardened Steel)
High-precision	FW T1500Z	FX AC1030U	FW AC1030U	FX AC1030U	SUMIDIA DA1000	SUMIBORON BN2000
Recommended Cutting Conditions	A10~		A14~		A22~	A20~

Applicable Inserts ◂·· S-STUP type/A-STUP type/B-STUP type/D-STUP type/C-STUP type/E-STUP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material —
General Machining	FB T1500Z	GU AC8025P	MU AC8025P	LB AC6030M	GU AC6030M	MU AC6030M	SUMIBORON BN7125	MU AC4015K	FX AC5015S	SUMIDIA DA1000	AY H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FF AC1030U	—	—	—	—	—	SUMIBORON BN7125	—	FX AC5015S	SUMIDIA DA1000	—	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	A10~			A14~			A16~		A18~	A22~		A20~		M2~

D-STUP type/C-STUB type/C-STUP type

T 60° | 93° | Steel with Anti-Vibration Mechanism | Coolant Hole

Internal Finishing to Medium Cutting
Screw-on

D-STUP
Stop Boring

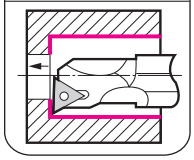


Fig 1

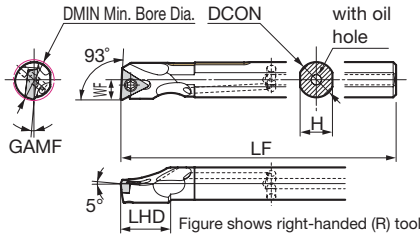


Figure shows right-handed (R) tool.

SumiTurn X-Bar

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism and Oil Hole	**D12M-STUP R/L1103-14**	XBPT-212 R/L H14	●	●	**14**	12	11	150	7	17	-7°	TP□□1103	**B109~**	1	BFTX0306A	**2.0**	TRX10
	D16R-STUP R/L1103-18	XBPT-216 R/L H18	●	●	**18**	16	15	200	9	18	-4°			1			
	D20S-STUP R/L1103-22	XBPT-220 R/L H22	●	●	**22**	20	18	250	11	18	-2°			1	BFTX0307A	**2.0**	

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E14

T 60° | 93° | Carbide | Carbide Short | Carbide Long

Internal Finishing to Medium Cutting
Screw-on

C-STUB
C-STUP
Stop Boring

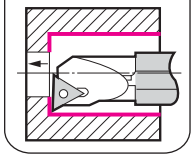


Fig 1

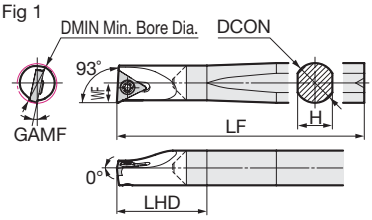


Fig 2

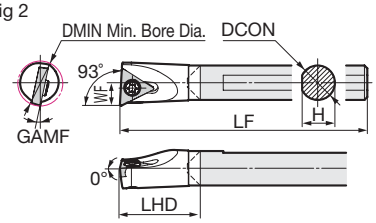


Fig 3

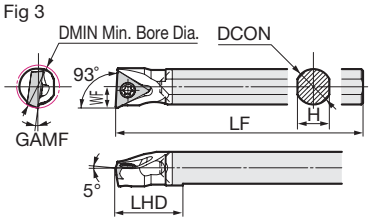


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

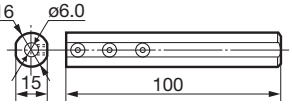
Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Carbide Standard	**C08H-STUB R/L0601-08**	WBPT-508 R/L S	●	●	**8**	8	7.0	100	4.0	50	-12°	TB□□0601	**B100~**	1	BFTX0204A	**0.5**	TRX06
	C08H-STUB R/L0601-08K	WBPT-508 R/L SK*	●	●	**8**	6	5.7	100	4.0	—	-12°			2	BFTX0204N	**0.5**	
	C08H-STUP R/L0802-10	WBPT-608 R/L S	●	●	**10**	8	7.0	100	5.0	18	-10°	TP□□0802	**B105~**	3	BFTX0204A	**0.5**	TRX06
	C10K-STUP R/L1103-12	WBPT-210 R/L S	●	●	**12**	10	9.0	125	6.0	19	-8°	TP□□1103	**B109~**	3	BFTX0306A	**2.0**	TRX10
	C12M-STUP R/L1103-14	WBPT-212 R/L S14	●	●	**14**	12	11.0	150	7.0	25	-7°			3			
	C12M-STUP R/L1103-16	WBPT-212 R/L S	●	●	**16**	12	11.0	150	8.0	25	-6°			3	BFTX0307A	**2.0**	
	C16R-STUP R/L1103-18	WBPT-216 R/L S18	●	●	**18**	16	15.0	200	9.0	30	-4°			3	BFTX0306A	**2.0**	
	C16R-STUP R/L1103-20	WBPT-216 R/L S	●	●	**20**	16	15.0	200	10.0	30	-2°			3	BFTX0307A	**2.0**	
	C20S-STUP R/L1103-22	WBPT-220 R/L S	●	●	**22**	20	18.0	250	11.0	35	-2°			3			
	C20S-STUP R/L1604-25	WBPT-320 R/L S	●	●	**25**	20	18.0	250	12.5	35	-3°	TP□□1604	**B112**	3	BFTX0410A	**3.4**	TRX15
Carbide Long	**C08M-STUB R/L0601-08**	WBPT-508 R/L	●	●	**8**	8	7.0	150	4.0	50	-12°	TB□□0601	**B100~**	1	BFTX0204A	**0.5**	TRX06
	C08M-STUP R/L0802-10	WBPT-608 R/L	●		**10**	8	7.0	150	5.0	18	-10°	TP□□0802	**B105~**	3	BFTX0204A	**0.5**	TRX06
	C10Q-STUP R/L1103-12	WBPT-210 R/L	●	●	**12**	10	9.0	180	6.0	19	-8°	TP□□1103	**B109~**	3	BFTX0306A	**2.0**	TRX10
	C12R-STUP R/L1103-14	WBPT-212 R/L 14	●		**14**	12	11.0	200	7.0	25	-7°			3			
	C12R-STUP R/L1103-16	WBPT-212 R/L	●		**16**	12	11.0	200	8.0	25	-6°			3	BFTX0307A	**2.0**	
	C16S-STUP R/L1103-18	WBPT-216 R/L 18	●		**18**	16	15.0	250	9.0	30	-4°			3	BFTX0306A	**2.0**	
	C16S-STUP R/L1103-20	WBPT-216 R/L	●		**20**	16	15.0	250	10.0	30	-2°			3	BFTX0307A	**2.0**	
Carbide Short	**C16M-STUP R/L1103-18**	WBPT-216 R/L E18	●	●	**18**	16	15.0	150	9.0	30	-4°	TP□□1103	**B109~**	3	BFTX0306A	**2.0**	TRX10
	C16M-STUP R/L1103-20	WBPT-216 R/L E	●	●	**20**	16	15.0	150	10.0	30	-2°			3	BFTX0307A	**2.0**	
	C20M-STUP R/L1103-22	WBPT-220 R/L E	●	●	**22**	20	18.0	150	11.0	35	-2°			3			
	C20M-STUP R/L1604-25	WBPT-320 R/L E	●	●	**25**	20	18.0	150	12.5	35	-3°	TP□□1604	**B112**	3	BFTX0410A	**3.4**	TRX15

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts. Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
C08H-STUB R/L0601-08K requires the separately sold HBB616 adapter sleeve.
Actual products marked with * show an ISO type code.

Smart Damper™ E14

Fig 1



Adapter Sleeve

Cat. No.	Stock	Fig
HBB 616	●	1

Adapter sleeve is optional.

N·m Recommended Tightening Torque (N·m)

E-STUP type

Internal Finishing to Medium Cutting
Screw-on

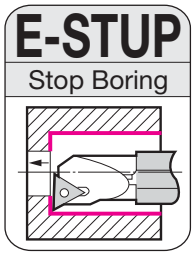
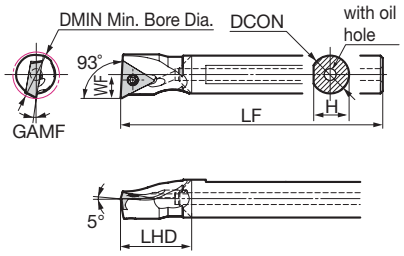


Fig 1



SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
Carbide with oil hole	**E08H-STUP R0802-10**	WBPT-608RH	●	**10**	8	7.5	100	5	18	-10°	TP□□0802	B105~	1	BFTX0204A	0.5	TRX06
	E10K-STUP R1103-12	WBPT-210RH	●	**12**	10	9.5	125	6	19	-8°			1	BFTX0306A	2.0	
	E12M-STUP R1103-14	WBPT-212RH14	●	**14**	12	11.5	150	7	25	-7°			1			
	E12M-STUP R1103-16	WBPT-212RH	●	**16**	12	11.5	150	8	25	-6°	TP□□1103	B109~	1	BFTX0307A	2.0	TRX10
	E16R-STUP R1103-18	WBPT-216RH18	●	**18**	16	15.5	200	9	30	-4°			1	BFTX0306A	2.0	
	E16R-STUP R1103-20	WBPT-216RH	●	**20**	16	15.5	200	10	30	-2°			1	BFTX0307A	2.0	

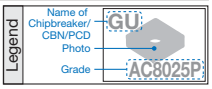
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.

Smart Damper™ E14

Applicable Inserts ◂·· S-STUB type/C-STUB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

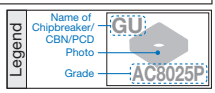


Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	N (Non-Ferrous) —	H (Hardened Steel) Uncoated
High-precision	**FW** **T1500Z**	**FX** **AC1030U**	**FW** **AC1030U**	**FX** **AC1030U**	**SUMIDIA** **DA1000**	**SUMIBORON** **BN2000**
Recommended Cutting Conditions	A10~		A14~		A22~	A20~

Applicable Inserts ◂·· S-STUP type/A-STUP type/B-STUP type/D-STUP type/C-STUP type/E-STUP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material —
General Machining	**FB** **T1500Z**	**GU** **AC8025P**	**MU** **AC8025P**	**LB** **AC6030M**	**GU** **AC6030M**	**MU** **AC6030M**	**SUMIBORON** **BN7125**	**MU** **AC4015K**	**FX** **AC5015S**	**SUMIDIA** **DA1000**	**AY** **H1**	**SUMIBORON** **BNC2125**	**SUMIBORON** **BN2000**	**SUMIDIA** **DA90**
High-precision	**FF** **AC1030U**	—	—	—	—	—	**SUMIBORON** **BN7125**	—	**FX** **AC5015S**	**SUMIDIA** **DA1000**	—	**SUMIBORON** **BNC2115**	**SUMIBORON** **BN1000**	**SUMIDIA BINDERLESS** **NPD10**
Recommended Cutting Conditions	A10~			A14~			A16~		A18~	A22~		A20~		M2~

N·m Recommended Tightening Torque (N·m)

S-CTFP type

Internal General-purpose
Clamp-on

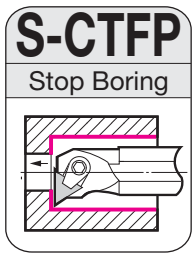


Fig 1

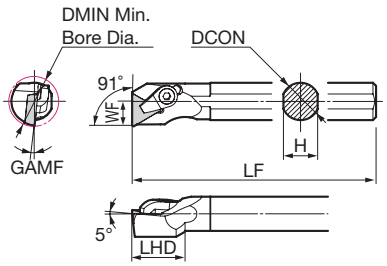


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

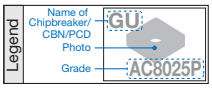
Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Plate	Double Screw	Wrench (For Hexagonal hole)
Steel	**S12M-CTFP R/L1103-16**	S12M-CTFP R/L 11	●	●	**16**	12	11	150	8.0	17	-6°	TP□□1103	**B113~**	1	CCM5BSL/R	WB5-10	LH025
	S16Q-CTFP R/L1103-20	S16Q-CTFP R/L 11	●	●	**20**	16	15	180	10.0	18	-4°			1			
	S20R-CTFP R/L1103-25	S20R-CTFP R/L 11	●	●	**25**	20	18	200	12.5	18	-2°			1			
	S25S-CTFP R/L1603-32	S25S-CTFP R/L 16	●	●	**32**	25	23	250	16.0	38	-2°	TP□□1603	**B114**	1	CCM8UL/R	WB8R/L-16T	LT27

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◂·· S-CTFP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



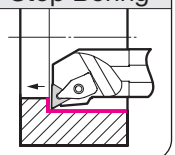
Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	N (Non-Ferrous) —	H (Hardened Steel) Uncoated
General Machining	FK **T1500Z**	SF **AC8025P**	SUMIBORON BN7000/BN500	No Chipbreaker **AC4015K**	No Chipbreaker **AC4015K**	No Chipbreaker **AC5015S**	No Chipbreaker **AC5025S**	SUMIDIA **DA1000**	SUMIBORON **BN2000**
Recommended Cutting Conditions	☞ A10~		☞ A16~			☞ A18~		☞ A22~	☞ A20~

11° inserts with holes can also be used.

S-DTFN type/D-DTFN type

Medium Diameter General-purpose
Double Clamp

S-DTFN
Stop Boring



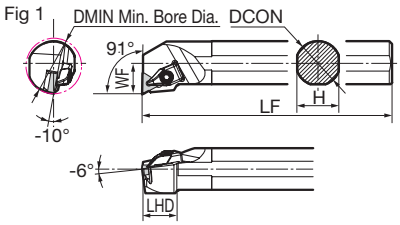


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	DCON	H	LF	WF	LHD	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench	Bottom Hex Wrench
																	(For Hexagonal hole)	(For Hexagonal hole)
Steel	**S32S-DTFN R/L1604-40**	●	●	**40**	32	30	250	22.0	26	TN□□1604	**B50~**	1	SCP-1	**5.0**	TNS1604B	BFTX0307N	LH040	LH025
	S40T-DTFN R/L1604-50	●	●	**50**	40	37	300	27.0	26			1						
	S50U-DTFN R/L1604-63	●	●	**63**	50	47	350	31.5	—			2						

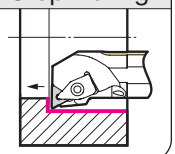
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Clamp Set Parts E82

Smart Damper™ E15

Medium Diameter General-purpose
Double Clamp

D-DTFN
Stop Boring



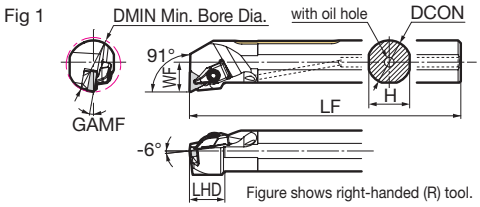


Figure shows right-handed (R) tool.

SumiTurn X-eco Bar

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	DCON	H	LF	WF	LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench	Bottom Hex Wrench
																		(For Hexagonal hole)	(For Hexagonal hole)
Steel with Anti-Vibration Mechanism and Oil Hole	**D25T-DTFN R/L1604-32**	●	●	**32**	25	23	300	17	21	-12°	TN□□1604	**B50~**	1	SCP-1	**5.0**	TNS1603B	BFTX0307N	LH040	LH025
	D32T-DTFN R/L1604-40	●	●	**40**	32	30	300	22	26	-10°			1			TNS1604B			
	D40U-DTFN R/L1604-50	●	●	**50**	40	37	350	27	26	-10°			1						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

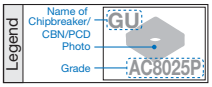
Clamp Set Parts E82

Smart Damper™ E15

Applicable Inserts ◂·· S-DTFN type/D-DTFN type/S-PTFN type/B-PTFN type/S-ETFN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) —	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE **T1500Z**	GU **AC8015P**	MU **AC8025P**	EF **AC6020M**	EG **AC6020M**	EM **AC6030M**	SUMIBORON BN7125/BNC500	UZ **AC4010K**	GZ **AC4010K**	EF **AC5015S**	EG **AC5015S**	EM **AC5015S**	SUMIDIA **DA1000**	SUMIBORON **BNC2115**	SUMIBORON **BN1000**
General Machining	SU **AC8015P**	GU **AC8025P**	MU **AC8025P**	EF **AC6030M**	EG **AC6030M**	EM **AC6040M**	SUMIBORON BN7125/BNC500	GZ **AC4015K**	GZ **AC4015K**	EF **AC5015S**	EG **AC5015S**	EM **AC5025S**	SUMIDIA **DA1000**	SUMIBORON **BNC2125**	SUMIBORON **BN2000**
Interrupted Cutting	SX **AC8025P**	UX **AC8035P**	MX **AC8035P**	EF **AC6030M**	EG **AC6040M**	EM **AC6040M**	SUMIBORON BN7125/BNC500	GZ **AC420K**	GZ **AC420K**	EF **AC5025S**	EG **AC5025S**	EM **AC5025S**	SUMIDIA **DA1000**	SUMIBORON **BNC300**	SUMIBORON **BN350**
Recommended Cutting Conditions	A10~			A14~			A16~			A18~			A22~	A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-PTFN type/B-PTFN type

Medium Diameter General-purpose
Lever Lock

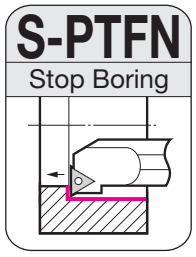


Fig 1

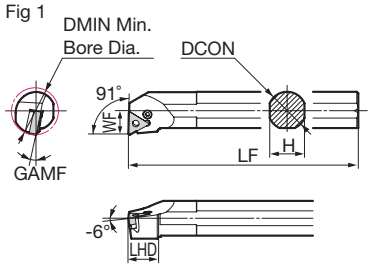


Fig 2

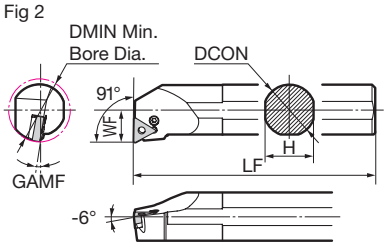


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
Steel	**S25R-PTFN R/L1604-32**	—	●	●	**32**	25	23	200	16.0	21.5	-12°	TN□□1604	**B50~**	1	LCL3	LCS3	LST317CA	LSP3	LH025
	S32S-PTFN R/L1604-40	—	●	●	**40**	32	30	250	20.0	21.0	-10°			1					
	S32S-PTFN R/L1604-44	S32S-PTFN R/L16	▲	▲	**44**	32	30	250	22.0	21.0	-10°			1					
	S40T-PTFN R/L1604-50	—	●	●	**50**	40	37	300	25.0	21.0	-10°			1					
	S50U-PTFN R/L1604-63	—	●	●	**63**	50	47	350	31.5	—	-10°			2					
	S40T-PTFN R/L2204-54	S40T-PTFN R/L22	▲	▲	**54**	40	37	300	27.0	26.0	-10°	TN□□2204	**B55~**	1	LCL4	LCS4	LST42	LSP4	LH030
	S50U-PTFN R/L2204-70	S50U-PTFN R/L22	▲	▲	**70**	50	47	350	35.0	33.0	-10°			1					

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Medium Diameter General-purpose
Lever Lock

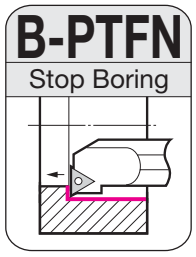


Fig 1

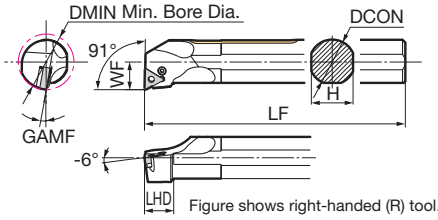


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
Steel with Anti-Vibration Mechanism	**B25T-PTFN R/L1604-32**	●		**32**	25	23	300	16	21	-12°	TN□□1604	**B50~**	1	LCL3	LCS3	LST317CA	LSP3	LH025
	B32U-PTFN R/L1604-40	●		**40**	32	30	350	20	21	-10°			1					
	B40W-PTFN R/L1604-50	●		**50**	40	37	450	25	21	-10°			1					

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S-ETFN type

Steel

Medium Diameter General-purpose
Pin Lock

S-ETFN
Stop Boring

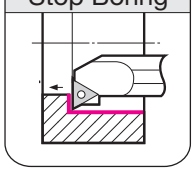


Fig 1

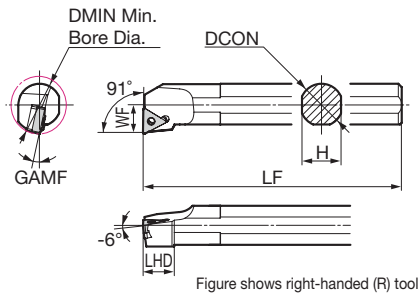


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Shim	Eccentric Pin	Wrench
Steel	**S25R-ETFN R/L1604-34**	BTFN325 R/L	●		**34**	25	23	200	17	18	-12°	TN□□1604	**B50~**	1	STW323	CPB34	LH025 (For Hexagonal hole)
	S32S-ETFN R/L1604-44	BTFN332 R/L	●		**44**	32	30	250	22	20	-10°			1		CPB35	
	S40T-ETFN R/L2204-54	BTFN440 R/L	●		**54**	40	37	300	27	25	-10°	TN□□2204	**B55~**	1	STW434	CPB44T	LH030
	S50U-ETFN R/L2204-70	BTFN450 R/L			**70**	50	47	350	35	32	-10°			1		CPB45T	

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◀·· S-DTFN type/D-DTFN type/S-PTFN type/B-PTFN type/S-ETFN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo — GU; Grade — AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	N (Non-Ferrous) —	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	SUMIBORON BN7125/BNC500	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIDIA DA1000	SUMIBORON BNC2115	SUMIBORON BN1000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIDIA DA1000	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	SUMIBORON BN7125/BNC500	GZ AC420K	GZ AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIDIA DA1000	SUMIBORON BNC300	SUMIBORON BN350
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~			☞ A18~			☞ A22~	☞ A20~	

BNC500 is for ductile cast iron.

S-SVJB type/B-SVJB type

Internal Profiling
Screw-on

S-SVJB

Concave Facing and Bottom Facing

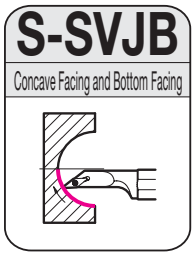


Fig 1

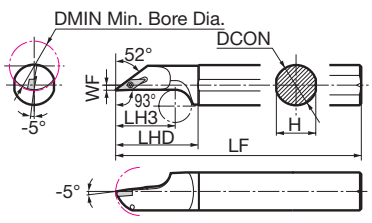


Fig 2

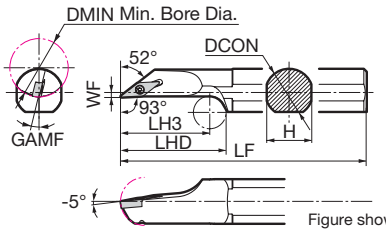


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Head LH3	Rake Angle GAMF	Applicable Inserts Cat. No.	Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	S20R-SVJB R/L1103-25	●	●	25	20	19	200	2.0	42	29	—	VB□□1103	B113~	1	BFTX02508NV	1.5	TRX08
	S25S-SVJB R/L1103-30	●	●	30	25	24	250	3.5	50	36	—			1			
	S32T-SVJB R/L1604-40	●	●	40	32	30	300	3.5	75	60	-8°	VB□□1604	B114	2	BFTX03508	2.0	TRX10
	S40T-SVJB R/L1604-50	●	●	50	40	37	300	4.5	95	75	-7°			2			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Internal Profiling
Screw-on

B-SVJB

Concave Facing and Bottom Facing

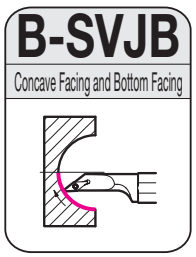


Fig 1

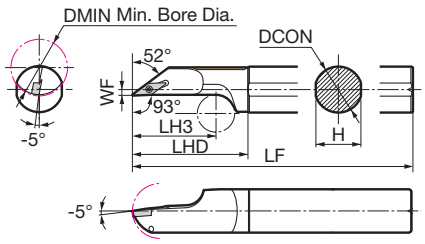


Figure shows right-handed (R) tool.

SumiTurn X Bar

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Head LH3	Applicable Insert Cat. No.	Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism	B20R-SVJB R/L1103-25	●	●	25	20	19	200	2.0	55	37.5	VB□□1103	B118~	1	BFTX02508NV	1.5	TRX08
	B25S-SVJB R/L1103-30	●	●	30	25	24	250	3.5	62	45			1			

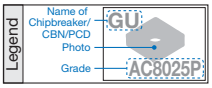
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts

◀·· S-SVJB type/B-SVJB type/S-SVQB type/B-SVQB type/C-SVQB type/S-SVUB type / B-SVUB type/C-SVUB type/S-SVZB type/B-SVZB type/C-SVZB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SUMIBORON BN7125/BNC500	No Chipbreaker AC4015K	SI AC5015S	AY H1	SUMIBORON BNC2125	SUMIBORON BN2000
High-precision	FYS AC1030U	SI AC1030U	FYS AC1030U	SI AC1030U	SUMIBORON BN7125/BNC500	—	SI AC5015S	—	SUMIBORON BNC2115	SUMIBORON BN1000
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A16~		☞ A18~	☞ A22~	☞ A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-SVJC type

Internal Profiling
Screw-on

Fig 1

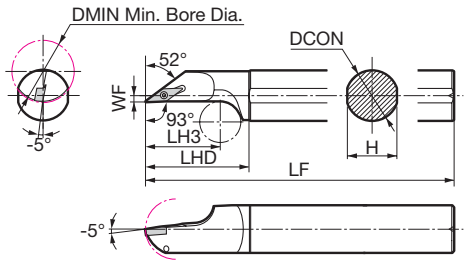


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

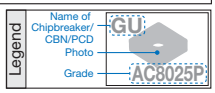
Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Head LH3	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
Steel	**S12M-SVJC R/L0802-16**	●	●	**16**	12	11	150	2.0	30	21	VC□□0802	**B121**	1	BFTX0204N	**0.5**	TRX06
	S16Q-SVJC R/L0802-20	●	●	**20**	16	15	180	2.0	40	29			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◀·· S-SVJC type/S-SVQC type/A-SVQC type/S-SVUC type/A-SVUC type/S-SVZC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	FB T1500Z	SU AC8025P	LB AC6030M	SU AC6030M	SU AC5015S	SU AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FC T1500A	SI AC1030U	FC AC1030U	SI AC1030U	FC AC5015S	SI AC5015S	SUMIBORON BNC2115	SUMIBORON BN2000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A18~		☞ A20~		☞ M2~

S-SVQB type/B-SVQB type

Internal Profiling
Screw-on

S-SVQB
Profiling

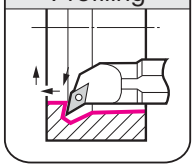


Fig 1

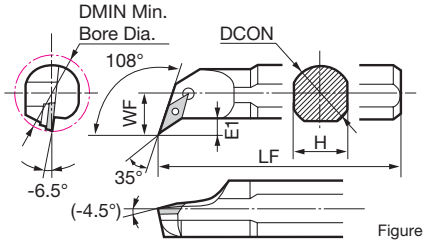


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Pin	Bolt	Shim	Flat Insert Screw	N·m	Wrench	Wrench for Bolt
																		(For Torx hole)	(For Hexagonal hole)
Steel	S20R-SVQB R/L1103-25	●	●	25	20	18	200	14.5	5.5	VB□□1103	B118~	1	—	—	—	BFTX02508NV	1.5	TRX08	—
	S25S-SVQB R/L1103-32	●	●	32	25	23	250	19.0	7.5			1							
	S25S-SVQB R/L1604-34	●	●	34	25	23	250	20.5	9.0	VB□□1604	B120	1	—	—	—	BFTX03508	2.0	TRX10	—
	S32T-SVQB R/L1604-40	●	●	40	32	30	300	22.0	9.0			1	VP32B	BH03504	SVP32				LH020
	S40T-SVQB R/L1604-50	●	●	50	40	37	300	27.0	10.0			1	VP40B						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E14

Internal Profiling
Screw-on

SumiTurn X-Bar

SumiSmall

B-SVQB
Profiling

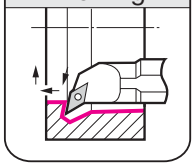


Fig 1

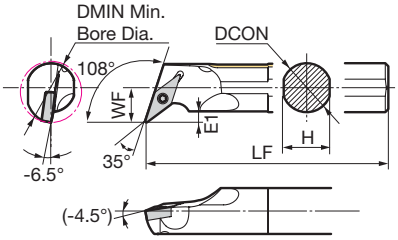


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench
															(For Torx hole)
Steel with Anti-Vibration Mechanism	B16R-SVQB R/L1103-20	●		20	16	15	200	11.5	4	VB□□1103	B118~	1	BFTX02508NV	1.5	TRX08
	B20R-SVQB R/L1103-25	●		25	20	18	200	14.5	5			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E14

Applicable Inserts

S-SVJB type/B-SVJB type/S-SVQB type/B-SVQB type/C-SVQB type/S-SVUB type/B-SVUB type/C-SVUB type/S-SVZB type/B-SVZB type/C-SVZB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo — GU; Grade — AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SUMIBORON BN7125/BNC500	No Chipbreaker AC4015K	SI AC5015S	AY H1	SUMIBORON BNC2125	SUMIBORON BN2000
High-precision	FYS AC1030U	SI AC1030U	FYS AC1030U	SI AC1030U	SUMIBORON BN7125/BNC500	—	SI AC5015S	—	SUMIBORON BNC2115	SUMIBORON BN1000
Recommended Cutting Conditions	A10~		A14~		A16~		A18~	A22~	A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

C-SVQB type

Internal Profiling
Screw-on

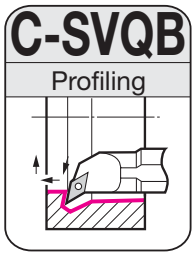


Fig 1

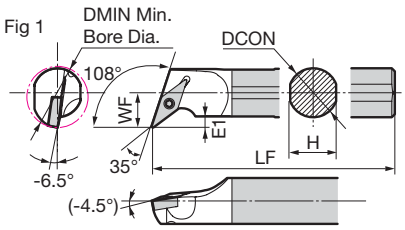


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Carbide	**C16R-SVQB R/L1103-20**	●		**20**	16	15	200	11.5	4	VB□□1103	**B118~**	1	BFTX02508NV	**1.5**	TRX08
	C20R-SVQB R/L1103-25	●		**25**	20	18	200	14.5	5			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

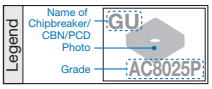
Smart Damper™ ☞ E14

Applicable Inserts

◀·· S-SVJB type/B-SVJB type/S-SVQB type/B-SVQB type/C-SVQB type/S-SVUB type/B-SVUB type/C-SVUB type/S-SVZB type/B-SVZB type/C-SVZB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SUMIBORON BN7125/BNC500	No Chipbreaker AC4015K	SI AC5015S	AY H1	SUMIBORON BNC2125	SUMIBORON BN2000
High-precision	FYS AC1030U	SI AC1030U	FYS AC1030U	SI AC1030U	SUMIBORON BN7125/BNC500	—	SI AC5015S	—	SUMIBORON BNC2115	SUMIBORON BN1000
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A16~		☞ A18~	☞ A22~	☞ A20~	

BNC500 is for ductile cast iron.

S-SVQC type/A-SVQC type

Internal Profiling
Screw-on

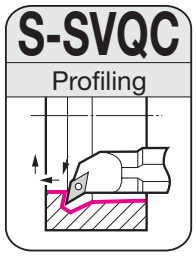


Fig 1

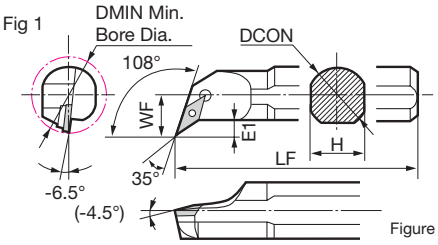


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S10M-SVQC R/L0802-14**	●	●	**14**	10	9	150	8.5	4.5	VC□□0802	**B121**	1	BFTX0204N	**0.5**	TRX06
	S12M-SVQC R/L0802-16	●	●	**16**	12	11	150	9.5	4.5			1			
	S16Q-SVQC R/L1103-20	●	●	**20**	16	15	180	11.5	4.5	VC□□1103	**B121~**	1	BFTX02508NV	**1.5**	TRX08

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Internal Profiling
Screw-on

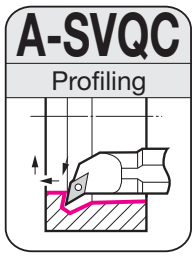


Fig 1

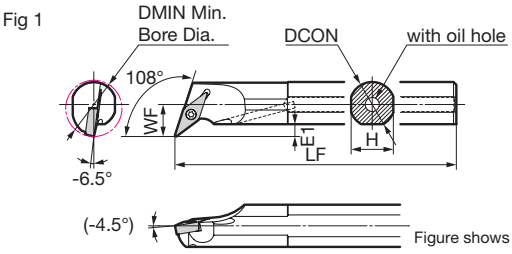


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

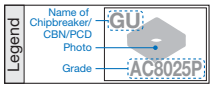
Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel with Oil Hole	**A16Q-SVQC R/L1103-20**	●	●	**20**	16	15	180	11.5	4.5			1			
	A20R-SVQC R/L1103-25	●	●	**25**	20	18	200	14.5	5.5	VC□□1103	**B121~**	1	BFTX02508NV	**1.5**	TRX08
	A25S-SVQC R/L1103-32	●	●	**32**	25	23	250	19.0	7.5			1			
	A25S-SVQC R/L1604-34	●	●	**34**	25	23	250	20.5	9.0	VC□□1604	**B122~**	1	BFTX03508	**2.0**	TRX10

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◀·· S-SVJC type/S-SVQC type/A-SVQC type/S-SVUC type/A-SVUC type/S-SVZC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material —
General Machining	**FB** **T1500Z**	**GU** **AC8025P**	**LB** **AC6030M**	**GU** **AC6030M**	**SU** **AC5015S**	**SU** **AC5025S**	**SUMIDIA** **DA1000**	**AG** **H1**	**SUMIBORON** **BNC2125**	**SUMIBORON** **BN2000**	**SUMIDIA** **DA90**
High-precision	**FF** **AC1030U**	**SI** **AC1030U**	**FF** **AC1030U**	**SI** **AC1030U**	**FF** **AC1030U**	**SI** **AC5015S**	**SUMIDIA** **DA1000**	—	**SUMIBORON** **BNC2115**	**SUMIBORON** **BN1000**	**SUMIDIA BINDERLESS** **NPD10**
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A18~		☞ A22~		☞ A20~		☞ M2~

N·m Recommended Tightening Torque (N·m)

S-SVUB type/B-SVUB type

Internal Profiling
Screw-on

S-SVUB
Profiling

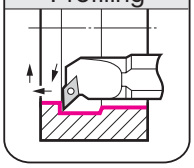


Fig 1

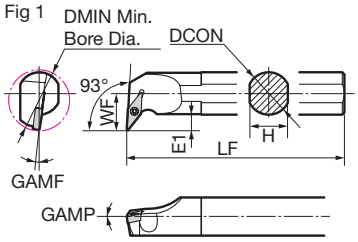


Fig 2

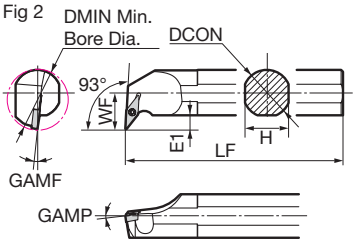


Fig 3

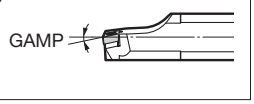


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Rake Angle GAMP	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Pin	Bolt	Shim	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)	Wrench for Bolt (For Hexagonal hole)
Steel	S20R-SVUB R/L1103-28	●	●	28	20	18	200	17.5	7.5	-7.5°	-3.0°	VB□□1103	B118~	1	—	—	—	BFTX02508NV	1.5	TRX08	—
	S25S-SVUB R/L1103-32	●	●	32	25	23	250	19.0	7.5	-6.5°	-2.5°			2							
	S25S-SVUB R/L1604-34	●	●	34	25	23	250	20.5	9.0	-7.5°	-3.0°	VB□□1604	B120	2	—	—	—	BFTX03508	2.0	TRX10	LH020
	S32T-SVUB R/L1604-40	●	●	40	32	30	300	23.5	10.5	-7.5°	-3.0°			3	VP32B	BH03504	SVP32				
	S40T-SVUB R/L1604-50	●	●	50	40	37	300	29.5	12.5	-7.5°	-3.0°			3	VP40B						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E14

Internal Profiling
Screw-on

B-SVUB
Profiling

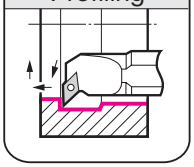


Fig 1

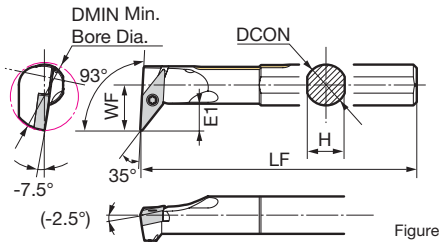


Figure shows right-handed (R) tool.

SumiTurn X-Bar

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism	B12M-SVUB R/L1103-20	●		20	12	11	150	13.5	8	VB□□1103	B118~	1	BFTX02508NV	1.5	TRX08
	B16R-SVUB R/L1103-25	●		25	16	15	200	16.5	9			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ E14

Applicable Inserts

◀·· S-SVJB type/B-SVJB type/S-SVQB type/B-SVQB type/C-SVQB type/S-SVUB type/B-SVUB type/C-SVUB type/S-SVZB type/B-SVZB type/C-SVZB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo / Grade — GU / AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SUMIBORON BN7125/BNC500	No Chipbreaker AC4015K	SI AC5015S	AY H1	SUMIBORON BNC2125	SUMIBORON BN2000
High-precision	FYS AC1030U	SI AC1030U	FYS AC1030U	SI AC1030U	SUMIBORON BN7125/BNC500	—	SI AC5015S	—	SUMIBORON BNC2115	SUMIBORON BN1000
Recommended Cutting Conditions	A10~		A14~		A16~		A18~	A22~	A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

C-SVUB type

Internal Profiling
Screw-on

SumiSmall

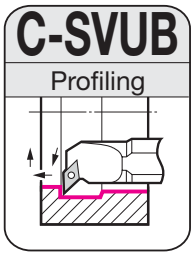


Fig 1

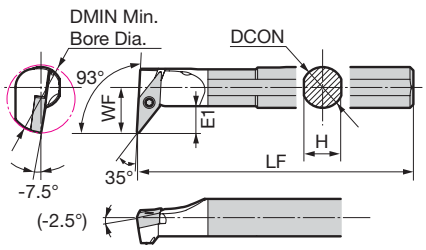


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Carbide	C12M-SVUB R/L1103-20	●		20	12	11	150	13.5	8	VB□□1103	B118~	1	BFTX02508NV	1.5	TRX08
	C16R-SVUB R/L1103-25	●		25	16	15	200	16.5	9			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Smart Damper™ ☞ E14

Applicable Inserts

S-SVJB type/B-SVJB type/S-SVQB type/B-SVQB type/C-SVQB type/S-SVUB type/B-SVUB type/C-SVUB type/S-SVZB type/B-SVZB type/C-SVZB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo — GU; Grade — AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SUMIBORON BN7125/BNC500	No Chipbreaker AC4015K	SI AC5015S	AY H1	SUMIBORON BNC2125	SUMIBORON BN2000
High-precision	FYS AC1030U	SI AC1030U	FYS AC1030U	SI AC1030U	SUMIBORON BN7125/BNC500	—	SI AC5015S	—	SUMIBORON BNC2115	SUMIBORON BN1000
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A16~		☞ A18~	☞ A22~	☞ A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-SVUC type/A-SVUC type

Internal Profiling
Screw-on

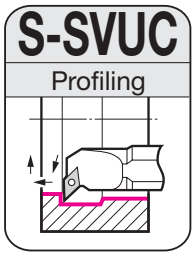


Fig 1

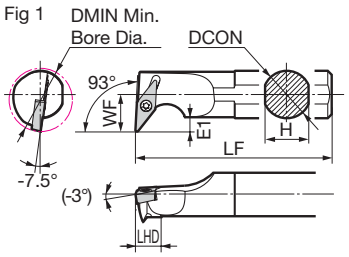


Fig 2

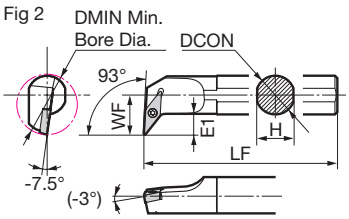


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Offset E1	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
Steel	S12M-SVUC R/L0802-16	●	●	16	12	11	150	9.5	6.5	3.5	VC□□0802	B121	1	BFTX0204N	0.5	TRX06
	S16Q-SVUC R/L0802-20	●	●	20	16	15	180	11.5	—	3.5			2			
	S16Q-SVUC R/L1103-25	●	●	25	16	15	180	16.5	—	8.5	VC□□1103	B121~	2	BFTX02508NV	1.5	TRX08

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Internal Profiling
Screw-on

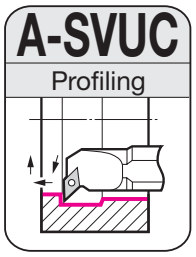


Fig 1

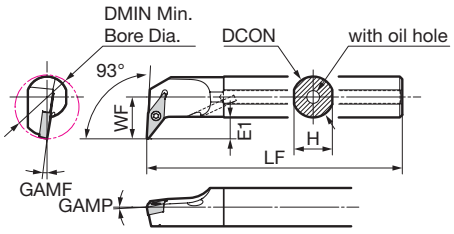


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

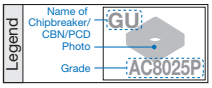
Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Rake Angle GAMF	Rake Angle GAMP	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
Steel with Oil Hole	A16Q-SVUC R/L1103-25	●	●	25	16	15	180	16.5	8.5	-7.5°	-3.0°			1			
	A20R-SVUC R/L1103-28	●	●	28	20	18	200	17.5	7.5	-7.5°	-3.0°	VC□□1103	B121~	1	BFTX02508NV	1.5	TRX08
	A25S-SVUC R/L1103-32	●	●	32	25	23	250	19.0	7.5	-6.5°	-2.5°			1			
	A25S-SVUC R/L1604-34	●	●	34	25	23	250	20.5	9.0	-7.5°	-3.0°	VC□□1604	B122~	1	BFTX03508	2.0	TRX10

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◀·· S-SVJC type/S-SVQC type/A-SVQC type/S-SVUC type/A-SVUC type/S-SVZC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SU AC5015S	SU AC5025S	SUMIDIA DA1000	AG H1	SUMIBORON BNC2125	SUMIBORON BN2000	SUMIDIA DA90
High-precision	FF AC1030U	SI AC1030U	FF AC1030U	SI AC1030U	FF AC1030U	SI AC5015S	SUMIDIA DA1000	—	SUMIBORON BNC2115	SUMIBORON BN1000	SUMIDIA BINDERLESS NPD10
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A18~		☞ A22~		☞ A20~		☞ M2~

S-SVZB type/B-SVZB type

Internal Profiling
Screw-on

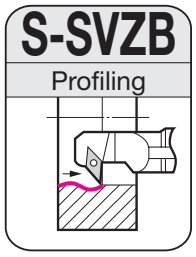


Fig 1

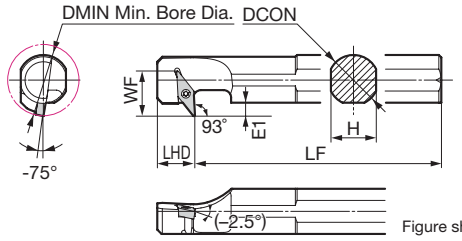


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Head LHD	Cutting Edge Distance WF	Offset E1	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Pin	Bolt	Shim	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)	Wrench for Bolt (For Hexagonal hole)
Steel	S20R-SVZB R/L1103-25	●	●	25	20	18	200	15	14.5	5.5	VB□□1103	B118~	1	—	—	—	BFTX02508NV	1.5	TRX08	—
	S25S-SVZB R/L1103-32	●	●	32	25	23	250	15	19.0	7.5			1							
	S25S-SVZB R/L1604-34	●	●	34	25	23	250	20	20.5	9.0	VB□□1604	B120	1	—	—	—	BFTX03508	2.0	TRX10	—
	S32T-SVZB R/L1604-40	●	●	40	32	30	300	20	22.0	9.0			1	VP32B	BH03504	SVP32				LH020
	S40T-SVZB R/L1604-50	●	●	50	40	37	300	20	27.0	10.0			1	VP40B						

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Internal Profiling
Screw-on

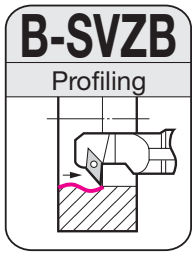


Fig 1

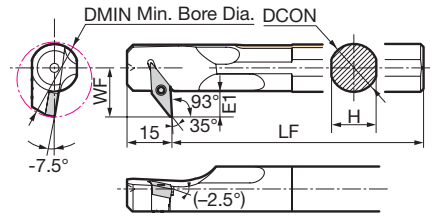


Figure shows right-handed (R) tool.

SumiTurn X Bar

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
Steel with Anti-Vibration Mechanism	B12M-SVZB R/L1103-20	●		20	12	11	150	13.5	8	VB□□1103	B118~	1	BFTX02508NV	1.5	TRX08
	B16R-SVZB R/L1103-25	●		25	16	15	200	16.5	9			1			

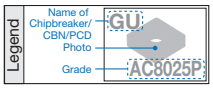
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts

◀·· S-SVJB type/B-SVJB type/S-SVQB type/B-SVQB type/C-SVQB type/S-SVUB type/B-SVUB type/C-SVUB type/S-SVZB type/B-SVZB type/C-SVZB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SUMIBORON BN7125/BNC500	No Chipbreaker AC4015K	SI AC5015S	AY H1	SUMIBORON BNC2125	SUMIBORON BN2000
High-precision	FYS AC1030U	SI AC1030U	FYS AC1030U	SI AC1030U	SUMIBORON BN7125/BNC500	—	SI AC5015S	—	SUMIBORON BNC2115	SUMIBORON BN1000
Recommended Cutting Conditions	A10~		A14~		A16~		A18~	A22~	A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

C-SVZB type

Internal Profiling
Screw-on

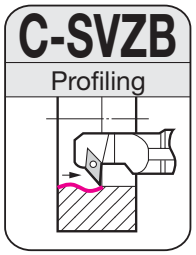


Fig 1

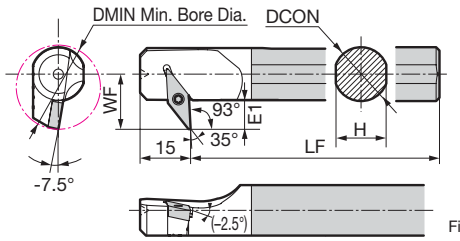


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Offset E1	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Flat Insert Screw	Flat Insert Screw N·m	Wrench (For Torx hole)
Carbide	**C12M-SVZB R/L1103-20**	●		**20**	12	11	150	13.5	8	VB□□1103	B118~	1	BFTX02508NV	**1.5**	TRX08
	C16R-SVZB R/L1103-25	●		**25**	16	15	200	16.5	9			1			

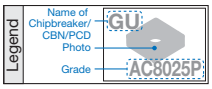
Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts

◀·· S-SVJB type/B-SVJB type/S-SVQB type/B-SVQB type/C-SVQB type/S-SVUB type/B-SVUB type/C-SVUB type/S-SVZB type/B-SVZB type/C-SVZB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	K (Cast Iron) High-speed Finishing	K (Cast Iron) Finishing to Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
General Machining	FB T1500Z	GU AC8025P	LB AC6030M	GU AC6030M	SUMIBORON BN7125/BNC500	No Chipbreaker AC4015K	SI AC5015S	AY H1	SUMIBORON BNC2125	SUMIBORON BN2000
High-precision	FYS AC1030U	SI AC1030U	FYS AC1030U	SI AC1030U	SUMIBORON BN7125/BNC500	—	SI AC5015S	—	SUMIBORON BNC2115	SUMIBORON BN1000
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A16~		☞ A18~	☞ A22~	☞ A20~	

BNC500 is for ductile cast iron.

N·m Recommended Tightening Torque (N·m)

S-SVZC type

Internal Profiling
Screw-on

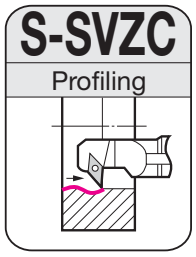


Fig 1

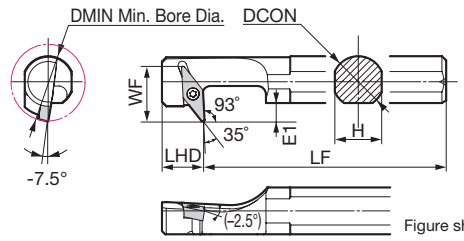


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

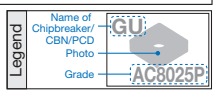
Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Head LHD	Cutting Edge Distance WF	Offset E1	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S12M-SVZC R/L0802-16**	●	●	**16**	12	11	150	10	9.5	4.5	VC□□0802	**B121**	1	BFTX0204N	**0.5**	TRX06
	S16Q-SVZC R/L1103-20	●	●	**20**	16	15	180	15	11.5	4.5	VC□□1103	**B121~**	1	BFTX02508NV	**1.5**	TRX08

Right-handed (R) tool holders are compatible with right-handed (R) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with left-handed (L) or neutral (N) inserts.

Applicable Inserts ◂·· S-SVJC type/S-SVQC type/A-SVQC type/S-SVUC type/A-SVUC type/S-SVZC type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.



Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	S (Exotic Alloy) Finishing to Medium Cutting	S (Exotic Alloy) Medium to Roughing	N (Non-Ferrous) High-precision/ Finishing	N (Non-Ferrous) Finishing to Medium Cutting	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated	Hard Brittle Material
General Machining	**FB T1500Z**	**GU AC8025P**	**LB AC6030M**	**GU AC6030M**	**SU AC5015S**	**SU AC5025S**	**SUMIDIA DA1000**	**AG H1**	**SUMIBORON BNC2125**	**SUMIBORON BN2000**	**SUMIDIA DA90**
High-precision	**FF AC1030U**	**SI AC1030U**	**FF AC1030U**	**SI AC1030U**	**FF AC1030U**	**SI AC5015S**	**SUMIDIA DA1000**	—	**SUMIBORON BNC2115**	**SUMIBORON BN1000**	**SUMIDIA BINDERLESS NPD10**
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A18~		☞ A22~		☞ A20~		☞ M2~

N·m Recommended Tightening Torque (N·m)

MEMO

S-SWUB type/C-SWUB type

W 80° | 93° | Steel

Internal Finishing (Small Diameter)
Screw-on

S-SWUB
Through Boring

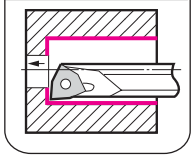


Fig 1

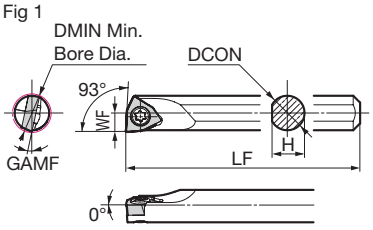


Fig 2

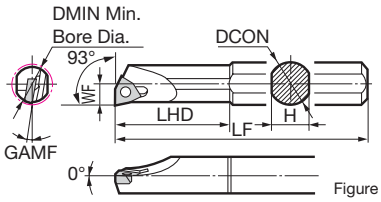


Figure shows right-handed (R) tool.

SumiSmall

Holder

Dimensions (mm)

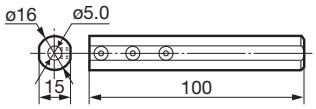
Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig
Steel	S05H-SWUB R/L0601-06K	BBPW-508 R/L K*	●	●	5.5	5	4.7	100	2.75	—	-12°	WB□□0601	B126	1
	S08H-SWUB R/L0601-06	BBPW-508 R/L	●	●	5.5	8	7.0	100	2.75	18	-12°			2
	S08H-SWUB R/L0601-08	BBPW-508 R/L 08*	●	●	8.0	8	7.0	100	4.00	30	-10°			2
	S08H-SWUB R/L0802-10	BBPW-608 R/L*	●	●	10.0	8	7.0	100	5.00	18	-13°	WB□□0802	B126	2
	S10K-SWUB R/L0802-12	BBPW-610 R/L*	●	●	12.0	10	9.0	125	6.00	20	-10°			2

Parts

Flat Insert Screw	N·m	Wrench (For Torx hole)
BFTX0203N	0.5	TRX06
BFTX02205N	0.5	TRX06

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
S05H-SWUB R/L0601-06K requires the separately sold HBB516 adapter sleeve.
Holders marked with * show an ISO Cat. No.

Fig 1



Adapter Sleeve

Cat. No.	Stock	Fig
HBB 516	●	1

Adapter sleeve is optional.

W 80° | 93° | Carbide

Internal Finishing (Small Diameter)
Screw-on

C-SWUB
Through Boring

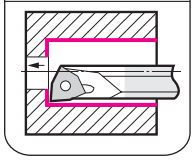


Fig 1

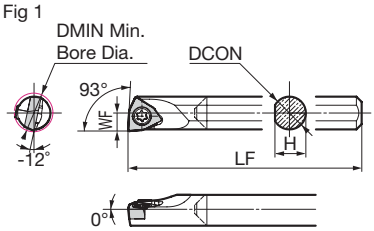


Fig 2

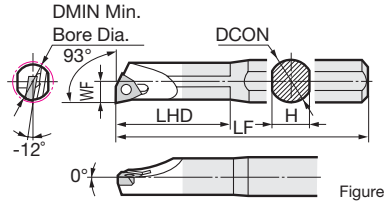


Figure shows right-handed (R) tool.

SumiSmall

Holder

Dimensions (mm)

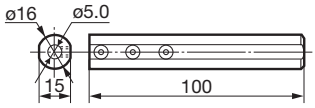
Shank Material	Cat. No.	Previous Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig
Carbide	C05H-SWUB R/L0601-06K	WBPW-508 R/L K*	●	●	5.5	5	4.7	100	2.75	—	WB□□0601	B126	1
	C08K-SWUB R/L0601-06	WBPW-508 R/L	●	●	5.5	8	7.0	125	2.75	30			2

Parts

Flat Insert Screw	N·m	Wrench (For Torx hole)
BFTX0203N	0.5	TRX06

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.
C05H-SWUB R/L0601-06K requires the separately sold HBB516 adapter sleeve.
Holders marked with * show an ISO Cat. No.

Fig 1



Adapter Sleeve

Cat. No.	Stock	Fig
HBB 516	●	1

Adapter sleeve is optional.

Applicable Inserts ◂·· S-SWUB type/C-SWUB type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo — GU; Grade — AC8025P

Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	M (Stainless Steel) Finishing	M (Stainless Steel) Roughing	K (Cast Iron) High-speed Finishing	S (Exotic Alloy) Finishing to Medium Cutting	N (Non-Ferrous) —	H (Hardened Steel) Uncoated
General Machining	FW T1500A	FX AC1030U	FX AC1030U	FX AC1030U	SUMIBORON BN7125	FX AC5015S	SUMIDIA DA1000	SUMIBORON BNX20
High-precision	FW T1500A	FX AC1030U	FX AC1030U	FX AC1030U	SUMIBORON BN7125	FX AC5015S	SUMIDIA DA1000	SUMIBORON BNX20
Recommended Cutting Conditions	☞ A10~		☞ A14~		☞ A16~	☞ A18~	☞ A22~	☞ A20~

The FY type chipbreaker (corner radius RE 0.2mm and below) and SUMIBORON and SUMIDIA inserts can also be used for stop-boring.

N·m Recommended Tightening Torque (N·m)

S-SWUP type

W 80° | 93° | Steel

Internal Finishing (Small Diameter)
Screw-on

SumiSmall

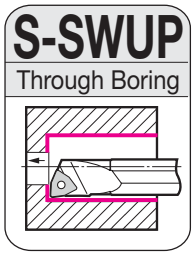


Fig 1

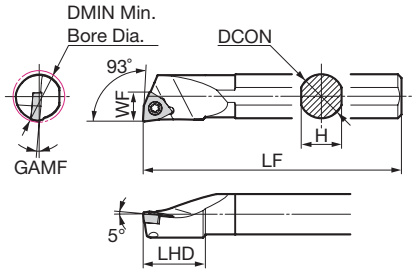


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Ref. Page	Fig	Flat Insert Screw	N·m	Wrench (For Torx hole)
Steel	**S12M-SWUP R/L1102-14**	●	●	**14**	12	11	150	7	17	-6°	WP□□1102	**B127**	1	BFTX02505N	**1.1**	TRX08
	S16Q-SWUP R/L1102-18	●	●	**18**	16	15	180	9	18	-3°			1			
	S16Q-SWUP R/L1603-18	●	●	**18**	16	15	180	9	18	-3°	WP□□1603	**B127**	1	BFTX0407N	**3.4**	TRX15
	S20R-SWUP R/L1603-22	●	●	**22**	20	18	200	11	18	-2°			1			

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◀·· S-SWUP type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD, Photo, Grade — GU, AC8025P

Application Range / Process	P (Steel)	M (Stainless Steel)
	Medium Cutting	Medium Cutting
General Machining	LB AC8025P	LB AC6030M
Recommended Cutting Conditions	A10~	A14~

S-DWLN type/D-DWLN type

W 80° | 95° | Steel

Medium Diameter General-purpose
Double Clamp

S-DWLN
Bottom Facing

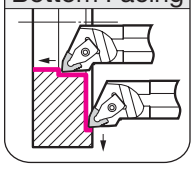


Fig 1

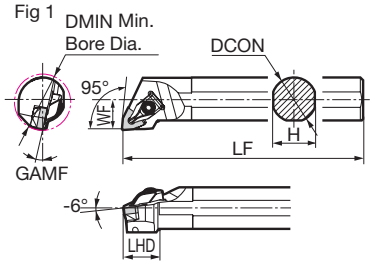


Fig 2

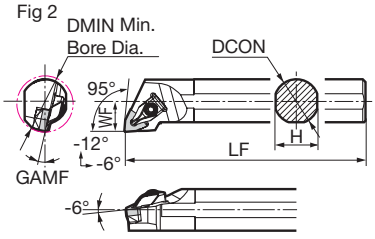


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
Steel	**S32S-DWLN R/L0604-40**	●	●	**40**	32	30	250	22.0	29	-10°	WN□□0604	**B63~**	1	SCP-4	**5.0**	WNS0603B	BFTX0307N	LH040	LH025
	S25R-DWLN R/L0804-32	●	●	**32**	25	23	200	17.0	26	-12°	WN□□0804	**B65~**	1	SCP-2	**5.0**	WNS0803B	BFTX0307N	LH040	LH025
	S32S-DWLN R/L0804-40	●	●	**40**	32	30	250	22.0	26	-12°			1			WNS0804B	BFTX0409N		
	S40T-DWLN R/L0804-50	●	●	**50**	40	37	300	27.0	26	-12°			1						
	S50U-DWLN R/L0804-63	●	●	**63**	50	47	350	31.5	—	-12°			2						

Feed direction of applicable inserts differs according to machining application. (Refer to * note below)

Clamp Set Parts E82

W 80° | 95° | Steel with Anti-Vibration Mechanism Coolant Hole

Medium Diameter General-purpose
Double Clamp

SumiTurn X-Bar

D-DWLN
Bottom Facing

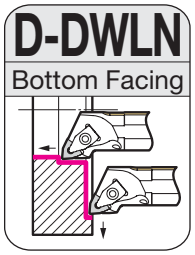


Fig 1

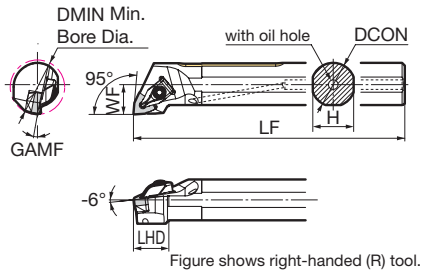


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Insert Cat. No.	Applicable Insert Ref. Page	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Top Hex Wrench (For Hexagonal hole)	Bottom Hex Wrench (For Hexagonal hole)
Steel with Anti-Vibration Mechanism and Oil Hole	**D25T-DWLN R/L0804-32**	●	●	**32**	25	23	300	17	26	-12°	WN□□0804	**B65~**	1	SCP-2	**5.0**	WNS0803B	BFTX0307N	LH040	LH025
	D32T-DWLN R/L0804-40	●	●	**40**	32	30	300	22	26	-10°			1			WNS0804B	BFTX0409N		
	D40U-DWLN R/L0804-50	●	●	**50**	40	37	350	27	26	-10°			1						

Feed direction of applicable inserts differs according to machining application. (Refer to * note below)

Clamp Set Parts E82

***Applicable Inserts for DWLN series**

For internal boring: Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts. Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

For facing: Right-handed (R) tool holders are compatible with right-handed (R) or neutral (N) inserts. Left-handed (L) tool holders are compatible with left-handed (L) or neutral (N) inserts.

N·m Recommended Tightening Torque (N·m)

S-PWLN type

W 80° | 95° | Steel

Medium Diameter General-purpose
Lever Lock

S-PWLN
Bottom Facing

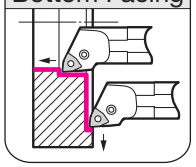


Fig 1

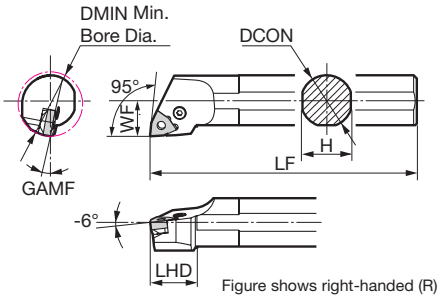


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Shank Material	Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Rake Angle GAMF	Applicable Inserts Cat. No.	Applicable Inserts Ref. Page	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench (For Hexagonal hole)
Steel	**S32S-PWLN R/L0604-40**	●	●	**40**	32	30	250	22	29	-10°	WN□□0604	**B63~**	1	LCL3	LCS3	LSW317	LSP3	LH025
	S32S-PWLN R/L0804-40	●	●	**40**	32	30	250	22	29	-10°	WN□□0804	**B65~**	1	LCL4	LCS4	LSW42B	LSP4	LH030
	S40T-PWLN R/L0804-50	●	●	**50**	40	37	300	27	29	-10°			1					

Right-handed (R) tool holders are compatible with left-handed (L) or neutral (N) inserts.
Left-handed (L) tool holders are compatible with right-handed (R) or neutral (N) inserts.

Applicable Inserts ◂·· S-DWLN type/D-DWLN type/S-PWLN type

1st Recommended Insert

- Refer as well to the Insert Selection Guide (page A10~).
- Depending on the insert size, some combinations cannot be made-to-order or manufactured.

Legend: Name of Chipbreaker/ CBN/PCD Photo — GU; Grade — AC8025P

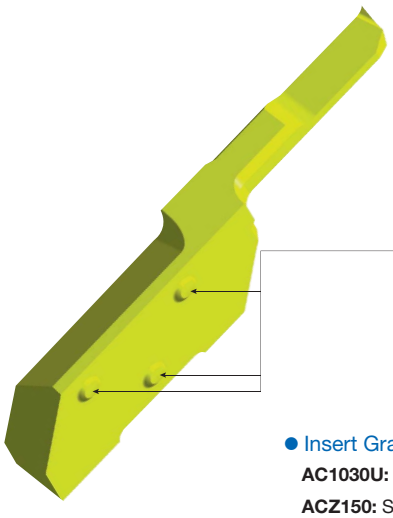
Application Range / Process	P (Steel) Finishing	P (Steel) Medium Cutting	P (Steel) Roughing	M (Stainless Steel) Finishing	M (Stainless Steel) Medium Cutting	M (Stainless Steel) Roughing	K (Cast Iron) Finishing to Medium Cutting	K (Cast Iron) Medium to Roughing	S (Exotic Alloy) Finishing	S (Exotic Alloy) Medium Cutting	S (Exotic Alloy) Roughing	H (Hardened Steel) Coated	H (Hardened Steel) Uncoated
Continuous Cutting	FE T1500Z	GU AC8015P	MU AC8025P	EF AC6020M	EG AC6020M	EM AC6030M	UZ AC4010K	GZ AC4010K	EF AC5015S	EG AC5015S	EM AC5015S	SUMIBORON BNC2115	SUMIBORON BN2000
General Machining	SU AC8015P	GU AC8025P	MU AC8025P	EF AC6030M	EG AC6030M	EM AC6040M	GZ AC4015K	GZ AC4015K	EF AC5015S	EG AC5015S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000
Interrupted Cutting	SX AC8025P	UX AC8035P	MX AC8035P	EF AC6030M	EG AC6040M	EM AC6040M	GZ AC420K	No Chipbreaker AC420K	EF AC5025S	EG AC5025S	EM AC5025S	SUMIBORON BNC2125	SUMIBORON BN2000
Recommended Cutting Conditions	☞ A10~			☞ A14~			☞ A16~		☞ A18~			☞ A20~	

CKB series

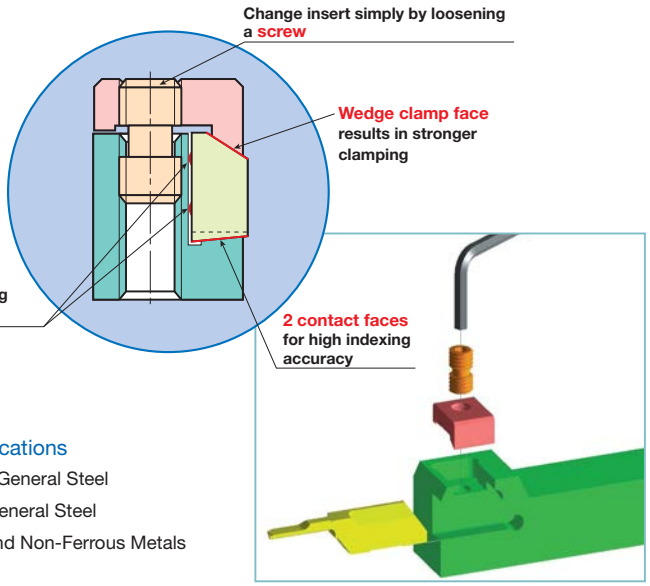
■ Features

- Minimum bore diameters from ø1mm to ø5mm are now in stock.
- Maximum boring depth of 20mm (ø4, ø5mm).
- Can be used with various small lathes.
- Unique design ensures high indexing accuracy.
- Indexable inserts are easily handled.

● High indexing accuracy



● Indexable inserts are easily handled.



● Insert Grades and Applications

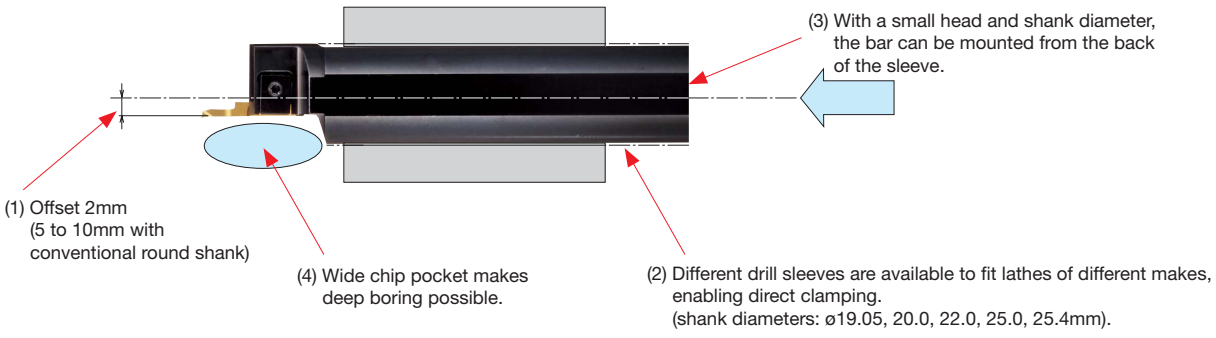
AC1030U: Stainless Steel, General Steel

ACZ150: Stainless Steel, General Steel

DA2200: Aluminum Alloy and Non-Ferrous Metals

■ Round Shank Holders (Small Offset) [S-CKB-S type]

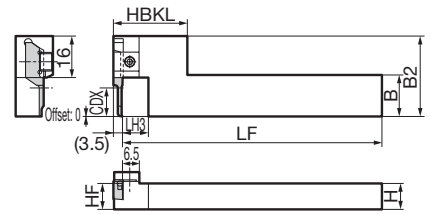
● 2mm offset bars expand application range.



Very Small Diameter L type
Clamp-on

SumiSmall

Fig 1



H = HF (Cutting Edge Height)

Holder

Parts

Dimensions (mm)

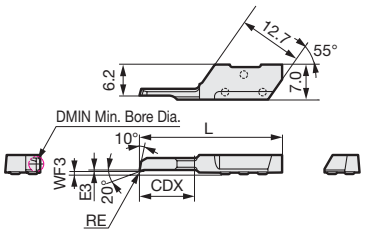
Cat. No.	Stock	Height H	Width B	Overall Length LF	Boring Depth CDX	Width B2	Head HBKL	Head LH3	Applicable Inserts	Fig	Clamp Plate	Double Screw	Wrench (For Hexagonal hole)
CKBS R1016-16-06	●	10	16	125	6	26	28.5	10	KBMX L0206-○○R	1	CKBW16	WB4-8	LH020
CKBS R1016-16-11	●	10	16	125	11	31	28.5	10	KBMX L03,04,0511-○○R	1			
CKBS R1216-16-06	●	12	16	150	6	26	28.5	10	KBMX L0206-○○R	1			
CKBS R1216-16-11	●	12	16	150	11	31	28.5	10	KBMX L03,04,0511-○○R	1			
CKBS R1216-16-20	●	12	16	150	20	40	28.5	10	KBMX L04,0520-○○R	1			
CKBS R1616-16-06	●	16	16	150	6	26	34.5	16	KBMX L0206-○○R	1			
CKBS R1616-16-11	●	16	16	150	11	31	34.5	16	KBMX L03,04,0511-○○R	1			
CKBS R1616-16-20	●	16	16	150	20	40	34.5	16	KBMX L04,0520-○○R	1			

KBMX type (For Very Small Diameter L type Holder) (Coated Carbide)

Dimensions (mm)

Cat. No.	AC1030U	Min. Bore Dia. DMIN	Cutting Edge Position WF3	Offset E3	Corner Radius RE	Overall Length L	Boring Depth CDX
KBMX L0206-05R	●	**2.0**	0.5	0.25	0.05	23.5	6
KBMX L0206-20R	●	**2.0**	0.5	0.25	0.20	23.5	6
KBMX L0311-05R	●	**3.0**	0.5	0.30	0.05	28.5	11
KBMX L0311-20R	●	**3.0**	0.5	0.30	0.20	28.5	11
KBMX L0411-05R	●	**4.0**	0.5	0.50	0.05	28.5	11
KBMX L0411-20R	●	**4.0**	0.5	0.50	0.20	28.5	11
KBMX L0420-05R	●	**4.0**	0.5	0.50	0.05	37.5	20
KBMX L0420-20R	●	**4.0**	0.5	0.50	0.20	37.5	20
KBMX L0511-05R	●	**5.0**	0.5	0.50	0.05	28.5	11
KBMX L0511-20R	●	**5.0**	0.5	0.50	0.20	28.5	11
KBMX L0520-05R	●	**5.0**	0.5	0.50	0.05	37.5	20
KBMX L0520-20R	●	**5.0**	0.5	0.50	0.20	37.5	20

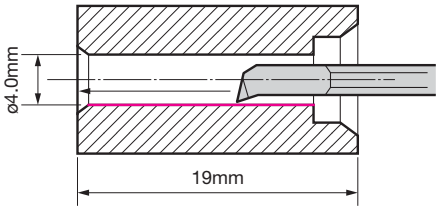
Fig 1



* Figure shows left-hand insert with a right-hand cutting edge

Application Example (1)

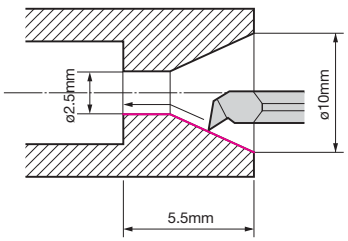
Electronic Component (Free Cutting Stainless Steel)



Holder : CKBR1212-16
Insert : **KBMXR 0420-05**
Cutting Speed : vc = 60m/min
Feed Rate : f = 0.01mm/rev
Depth of Cut : ap = 0.03mm
Coolant : Non-water-soluble coolant

Application Example (2)

Automotive Fuel Pump Component (SUS430)

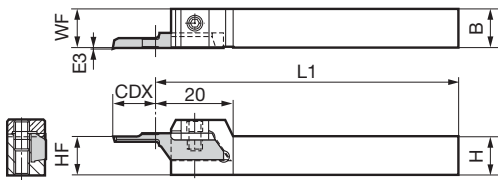


Holder : CKBR1616-16
Insert : **KBMXR 0206-05T**
Cutting Speed : vc = 80m/min
Feed Rate : f = 0.03mm/rev
Depth of Cut : ap = 0.05mm
Coolant : Non-water-soluble coolant

CKB series

Square Shank
Clamp-on

Fig 1



Refer to pages E69 to E70 for E3 and CDX values.

Holder

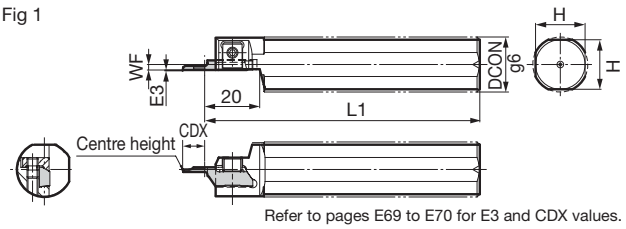
Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length L1	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Clamp Plate	Double Screw	Wrench (For Hexagonal hole)
CKB R1010-16	●	10	10	100	10	10	1			
CKB R1212-16	●	12	12	125	12	12	1			
CKB R1616-16	●	16	16	125	16	16	1	CKBW16	WB4-8	LH020
CKB R2020-16	●	20	20	125	20	20	1			
CKB R2525-16		25	25	150	25	25	1			

Round Shank (Small Offset)
Clamp-on

Fig 1



Refer to pages E69 to E70 for E3 and CDX values.

Holder

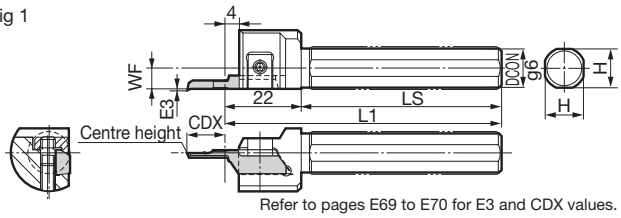
Parts

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length L1	Cutting Edge Distance WF	Fig	Clamp Plate	Double Screw	Wrench (For Hexagonal hole)
S1905H-CKB RS-16	●	19.05	17	100	2	1			
S20H-CKB RS-16	●	20	18	100	2	1			
S22K-CKB RS-16	●	22	19	125	2	1	CKBW16	WB4-8	LH020
S25K-CKB RS-16	●	25	23	125	2	1			
S254K-CKB RS-16	●	25.4	23	125	2	1			

Round Shank
Clamp-on

Fig 1



Refer to pages E69 to E70 for E3 and CDX values.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length L1	Length LS	Cutting Edge Distance WF	Fig	Clamp Plate	Double Screw	Wrench (For Hexagonal hole)
S10F-CKB R-16	●	10	9	80	58	5	1			
S12F-CKB R-16	●	12	11	80	58	6	1			
S16H-CKB R-16	●	16	15	100	78	8	1	CKBW16	WB4-8	LH020
S19K-CKB R-16	●	19.05	17	125	103	8	1			
S20K-CKB R-16	●	20	18	125	103	10	1			

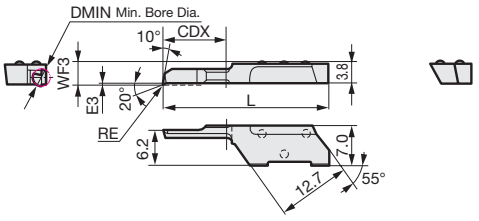
CKB series

(Coated Carbide)

KBMX type (Internal Boring)

Dimensions (mm)

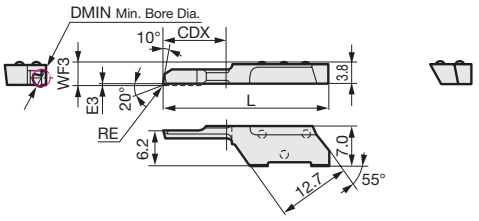
Cat. No.	AC1030U	Min. Bore Dia. DMIN	Cutting Edge Position WF3	Offset E3	Corner Radius RE	Overall Length L	Boring Depth CDX
KBMX R0103-05	●	**1.0**	4.00	0.20	0.05	20.5	3
KBMX R0103-20	●	**1.0**	4.00	0.20	0.20	20.5	3
KBMX R01506-05	●	**1.5**	4.05	0.25	0.05	23.5	6
KBMX R01506-20	●	**1.5**	4.05	0.25	0.20	23.5	6
KBMX R0206-05	●	**2.0**	4.05	0.25	0.05	23.5	6
KBMX R0206-20	●	**2.0**	4.05	0.25	0.20	23.5	6
KBMX R0311-05	●	**3.0**	4.10	0.30	0.05	28.5	11
KBMX R0311-20	●	**3.0**	4.10	0.30	0.20	28.5	11
KBMX R0411-05	●	**4.0**	4.30	0.50	0.05	28.5	11
KBMX R0411-20	●	**4.0**	4.30	0.50	0.20	28.5	11
KBMX R0420-05	●	**4.0**	4.30	0.50	0.05	37.5	20
KBMX R0420-20	●	**4.0**	4.30	0.50	0.20	37.5	20
KBMX R0511-05	●	**5.0**	4.50	0.70	0.05	28.5	11
KBMX R0511-20	●	**5.0**	4.50	0.70	0.20	28.5	11
KBMX R0520-05	●	**5.0**	4.50	0.70	0.05	37.5	20
KBMX R0520-20	●	**5.0**	4.50	0.70	0.20	37.5	20



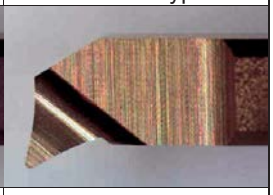
KBMX-T type (Internal Boring)

Dimensions (mm)

Cat. No.	ACZ150	Min. Bore Dia. DMIN	Cutting Edge Position WF3	Offset E3	Corner Radius RE	Overall Length L	Boring Depth CDX
KBMX R0103-05T	●	**1.0**	4.00	0.20	0.05	20.5	3
KBMX R0103-20T	●	**1.0**	4.00	0.20	0.20	20.5	3
KBMX R01506-05T	●	**1.5**	4.05	0.25	0.05	23.5	6
KBMX R01506-20T	●	**1.5**	4.05	0.25	0.20	23.5	6
KBMX R0206-05T	●	**2.0**	4.05	0.25	0.05	23.5	6
KBMX R0206-20T	●	**2.0**	4.05	0.25	0.20	23.5	6
KBMX R0311-05T	●	**3.0**	4.10	0.30	0.05	28.5	11
KBMX R0311-20T	●	**3.0**	4.10	0.30	0.20	28.5	11
KBMX R0411-05T	●	**4.0**	4.30	0.50	0.05	28.5	11
KBMX R0411-20T	●	**4.0**	4.30	0.50	0.20	28.5	11
KBMX R0511-05T	●	**5.0**	4.50	0.70	0.05	28.5	11
KBMX R0511-20T	●	**5.0**	4.50	0.70	0.20	28.5	11



Recommended Cutting Conditions E71

KBMX type	KBMX-T type
	
Compacts chip curl for evacuation.	Evacuates chips toward the back. Lowers cutting force to prevent chattering.

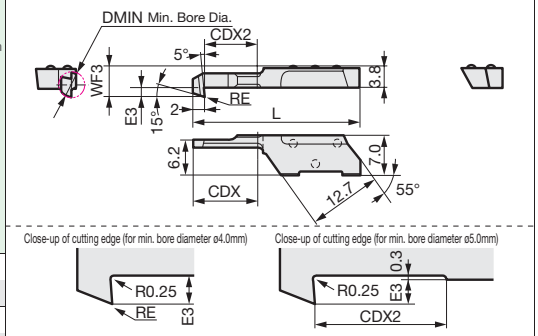
CKB series

(Coated Carbide / SUMIDIA)

KBMZ type (Internal Back Turning)

Dimensions (mm)

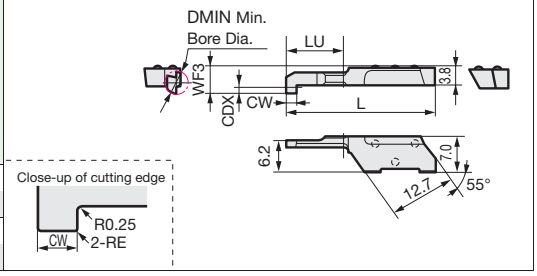
Cat. No.	AC1030U	Min. Bore Dia. DMIN	Cutting Edge Position WF3	Offset E3	Corner Radius RE	Overall Length L	Maximum Boring Depth CDX	Boring Depth CDX2
KBMZ R0411-05	●	**4.0**	5.10	1.3	0.05	28.5	11	9
KBMZ R0411-20	●	**4.0**	5.10	1.3	0.20	28.5	11	9
KBMZ R0511-05	●	**5.0**	5.10	1.3	0.05	28.5	11	9
KBMZ R0511-20	●	**5.0**	5.10	1.3	0.20	28.5	11	9



KBMG type (Internal Grooving)

Dimensions (mm)

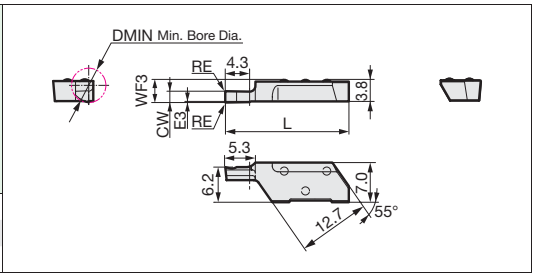
Cat. No.	AC1030U	Min. Bore Dia. DMIN	Cutting Edge Distance WF3	Width of Cut CW	Corner Radius RE	Overall Length L	Maximum Groove Depth CDX	Machinable Length LU
KBMG R0411-05	●	**4.0**	4.90	1.00	0.05	28.5	1.1	11
KBMG R0411-10	●	**4.0**	4.90	2.00	0.10	28.5	1.1	11
KBMG R0511-05	●	**5.0**	5.10	1.00	0.05	28.5	1.3	11
KBMG R0511-10	●	**5.0**	5.10	2.00	0.10	28.5	1.3	11



KBMF type (Face Grooving)

Dimensions (mm)

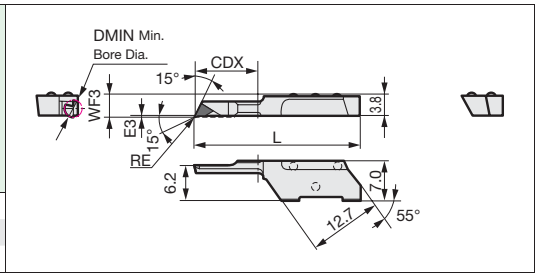
Cat. No.	ACZ150	Min. Bore Dia. DMIN	Cutting Edge Position WF3	Offset E3	Width of Cut CW	Corner Radius RE	Overall Length L	Maximum Groove Depth
KBMF R0615-05	●	**6.0**	4.0	0.2	1.5	0.05	21.8	4.0
KBMF R0620-05	●	**6.0**	4.0	0.2	2.0	0.05	21.8	4.0
KBMF R0630-05	●	**6.0**	4.0	0.2	3.0	0.05	21.8	4.0



KBMX type (SUMIDIA/Internal Boring)

Dimensions (mm)

Cat. No.	DA2200	Min. Bore Dia. DMIN	Cutting Edge Position WF3	Offset E3	Corner Radius RE	Overall Length L	Maximum Boring Depth CDX
KBMX R0311-10	●	**3.0**	4.1	0.3	0.1	28.5	11
KBMX R0411-10	●	**4.0**	4.3	0.5	0.1	28.5	11
KBMX R0511-10	●	**5.0**	4.5	0.7	0.1	28.5	11



Recommended Cutting Conditions E71

Recommended Cutting Conditions (CKB series)

Work Material		P General Steel	M Stainless Steel	N Non-Ferrous Metal		S Exotic Alloy
Internal Boring	Insert Grades	ACZ150/AC1030U	ACZ150/AC1030U	ACZ150/AC1030U	DA2200	ACZ150/AC1030U
	Spindle Speed **n** (min^{-1})	2,000 to 10,000	2,000 to 8,000	5,000 to 15,000	5,000 to 15,000	2,000 to 6,000
	Depth of Cut **ap** (mm)	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2
	Feed Rate **f** (mm/rev)	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05
Internal Back Turning	Spindle Speed **n** (min^{-1})	2,000 to 10,000	2,000 to 8,000	5,000 to 15,000	-	2,000 to 6,000
	Depth of Cut **ap** (mm)	up to 0.2	up to 0.2	up to 0.2	-	up to 0.2
	Feed Rate **f** (mm/rev)	up to 0.05	up to 0.05	up to 0.05	-	up to 0.05
Internal Grooving	Spindle Speed **n** (min^{-1})	2,000 to 10,000	2,000 to 8,000	5,000 to 15,000	-	2,000 to 4,000
	Feed Rate **f** (mm/rev)	up to 0.03	up to 0.03	up to 0.05	-	up to 0.02
Face Grooving	Spindle Speed **n** (min^{-1})	2,000 to 10,000	2,000 to 8,000	5,000 to 15,000	-	2,000 to 4,000
	Feed Rate **f** (mm/rev)	up to 0.03	up to 0.03	up to 0.05	-	up to 0.02

BXBR series

■ Features

- Economical 2-cornered bars
- Boring depths of 5D (5 times the shank diameter)
- Usable at any desired overhang
- Shank size = min. bore diameter for easy selection. (Available from ø2.0mm to ø5.0mm in 0.5mm increments)
- KBMX type cutting edge used. Bars with no chipbreaker are also available in stock
- Corner radius expansion (RE = 0.15mm)
- AC1030U with excellent cutting edge quality now in stock (bars with chipbreaker only)

Expansion Carbide

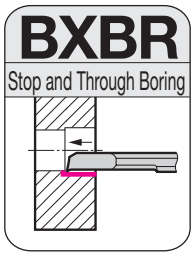
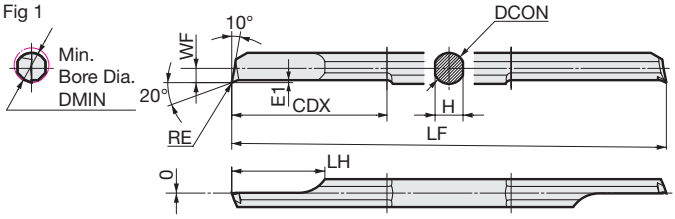


Fig 1



Internal (Small Diameter) Finishing
Solid

SumiSmall

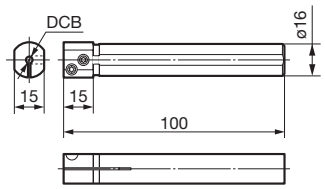
Bar (With Chipbreaker) (Coated Carbide)

Dimensions (mm)

Cat. No.	AC1030U	ACZ150	AC530U	*Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LH	Maximum Boring Depth CDX	Offset E1	Corner Radius RE	Applicable Sleeve	Fig
BXBR 02005R	●	●		**2.0**	2.0	1.8	50	0.80	6.0	10.0	0.20	0.05	HBX 2016	1
BXBR 02015R New	●			**2.0**	2.0	1.8	50	0.80	6.0	10.0	0.20	0.15	HBX 2016	1
BXBR 02020R	●	●		**2.0**	2.0	1.8	50	0.80	6.0	10.0	0.20	0.20	HBX 2016	1
BXBR 02505R	●	●		**2.5**	2.5	2.2	50	1.05	7.5	12.5	0.20	0.05	HBX 2516	1
BXBR 02515R New	●			**2.5**	2.5	2.2	50	1.05	7.5	12.5	0.20	0.15	HBX 2516	1
BXBR 02520R	●	●		**2.5**	2.5	2.2	50	1.05	7.5	12.5	0.20	0.20	HBX 2516	1
BXBR 03005R	●	●		**3.0**	3.0	2.7	50	1.30	9.0	15.0	0.25	0.05	HBX 3016	1
BXBR 03015R New	●			**3.0**	3.0	2.7	50	1.30	9.0	15.0	0.25	0.15	HBX 3016	1
BXBR 03020R	●	●		**3.0**	3.0	2.7	50	1.30	9.0	15.0	0.25	0.20	HBX 3016	1
BXBR 03505R	●	●		**3.5**	3.5	3.1	60	1.55	10.5	17.5	0.25	0.05	HBX 3516	1
BXBR 03515R New	●			**3.5**	3.5	3.1	60	1.55	10.5	17.5	0.25	0.15	HBX 3516	1
BXBR 03520R	●	●		**3.5**	3.5	3.1	60	1.55	10.5	17.5	0.25	0.20	HBX 3516	1
BXBR 04005R	●	●		**4.0**	4.0	3.6	60	1.80	12.0	20.0	0.35	0.05	HBX 4016	1
BXBR 04015R New	●			**4.0**	4.0	3.6	60	1.80	12.0	20.0	0.35	0.15	HBX 4016	1
BXBR 04020R	●	●		**4.0**	4.0	3.6	60	1.80	12.0	20.0	0.35	0.20	HBX 4016	1
BXBR 04505R	●	●		**4.5**	4.5	4.1	70	2.05	13.5	22.5	0.35	0.05	HBX 4516	1
BXBR 04515R New	●			**4.5**	4.5	4.1	70	2.05	13.5	22.5	0.35	0.15	HBX 4516	1
BXBR 04520R	●	●		**4.5**	4.5	4.1	70	2.05	13.5	22.5	0.35	0.20	HBX 4516	1
BXBR 05005R	●	●		**5.0**	5.0	4.5	70	2.30	15.0	25.0	0.40	0.05	HBX 5016	1
BXBR 05015R New	●			**5.0**	5.0	4.5	70	2.30	15.0	25.0	0.40	0.15	HBX 5016	1
BXBR 05020R	●	●		**5.0**	5.0	4.5	70	2.30	15.0	25.0	0.40	0.20	HBX 5016	1

* Boring depth CDX or less.

Fig 1



Sleeve

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Bar
HBX 2016	●	2.0	BXBR 020○○R(-NB)
HBX 2516	●	2.5	BXBR 025○○R(-NB)
HBX 3016	●	3.0	BXBR 030○○R(-NB)
HBX 3516	●	3.5	BXBR 035○○R(-NB)
HBX 4016	●	4.0	BXBR 040○○R(-NB)
HBX 4516	●	4.5	BXBR 045○○R(-NB)
HBX 5016	●	5.0	BXBR 050○○R(-NB)

BXBR bars can also be used with HBB type sleeves.
Commercially available sleeves may also be used.
Refer to page E78 for details on HBX type sleeves.

Parts (for Adapter Sleeve)

Applicable Sleeve	Flat Insert Screw	N·m	Set Screw	Wrench
				(For Torx hole)
HBX○○○○	BFTX0409N	3.4	BT06035T	TRD15

Sleeve is optional.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked Item (new product/expanded item)

Expansion Carbide

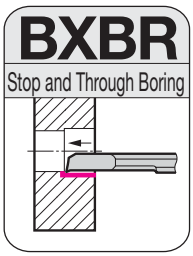
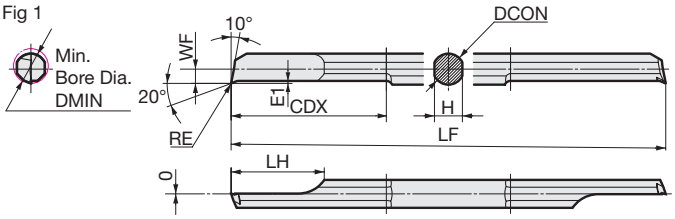


Fig 1



Internal (Small Diameter) Finishing
Solid

SumiSmall

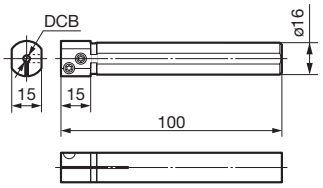
Bar (No Chipbreaker) (Coated Carbide)

Dimensions (mm)

Cat. No.	AC1030U	ACZ150	AC530U	*Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LH	Maximum Boring Depth CDX	Offset E1	Corner Radius RE	Applicable Sleeve	Fig
BXBR 02005R-NB		●		**2.0**	2.0	1.8	50	0.80	6.0	10.0	0.20	0.05	HBX 2016	1
BXBR 02020R-NB		●		**2.0**	2.0	1.8	50	0.80	6.0	10.0	0.20	0.20	HBX 2016	1
BXBR 02505R-NB		●		**2.5**	2.5	2.2	50	1.05	7.5	12.5	0.20	0.05	HBX 2516	1
BXBR 02520R-NB		●		**2.5**	2.5	2.2	50	1.05	7.5	12.5	0.20	0.20	HBX 2516	1
BXBR 03005R-NB		●		**3.0**	3.0	2.7	50	1.30	9.0	15.0	0.25	0.05	HBX 3016	1
BXBR 03020R-NB		●		**3.0**	3.0	2.7	50	1.30	9.0	15.0	0.25	0.20	HBX 3016	1
BXBR 03505R-NB		●		**3.5**	3.5	3.1	60	1.55	10.5	17.5	0.25	0.05	HBX 3516	1
BXBR 03520R-NB		●		**3.5**	3.5	3.1	60	1.55	10.5	17.5	0.25	0.20	HBX 3516	1
BXBR 04005R-NB		●		**4.0**	4.0	3.6	60	1.80	12.0	20.0	0.35	0.05	HBX 4016	1
BXBR 04020R-NB		●		**4.0**	4.0	3.6	60	1.80	12.0	20.0	0.35	0.20	HBX 4016	1
BXBR 04505R-NB		●		**4.5**	4.5	4.1	70	2.05	13.5	22.5	0.35	0.05	HBX 4516	1
BXBR 04520R-NB		●		**4.5**	4.5	4.1	70	2.05	13.5	22.5	0.35	0.20	HBX 4516	1
BXBR 05005R-NB		●		**5.0**	5.0	4.5	70	2.30	15.0	25.0	0.40	0.05	HBX 5016	1
BXBR 05020R-NB		●		**5.0**	5.0	4.5	70	2.30	15.0	25.0	0.40	0.20	HBX 5016	1

* Boring depth CDX or less.

Fig 1



Sleeve

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Tool Holder
HBX 2016	●	2.0	BXBR 020○○R(-NB)
HBX 2516	●	2.5	BXBR 025○○R(-NB)
HBX 3016	●	3.0	BXBR 030○○R(-NB)
HBX 3516	●	3.5	BXBR 035○○R(-NB)
HBX 4016	●	4.0	BXBR 040○○R(-NB)
HBX 4516	●	4.5	BXBR 045○○R(-NB)
HBX 5016	●	5.0	BXBR 050○○R(-NB)

BXBR bars can also be used with HBB type sleeves.
Commercially available sleeves may also be used.
Refer to page E78 for details on HBX type sleeves.

Parts (for Adapter Sleeve)

Applicable Sleeve	Flat Insert Screw		Set Screw	Wrench
		N·m		(For Torx hole)
HBX○○○○	BFTX0409N	3.4	BT06035T	TRD15

Sleeve is optional.

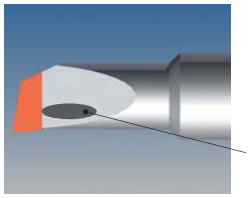
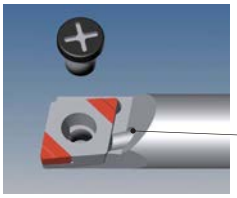
Recommended Cutting Conditions

Work Material		P General Steel	M Stainless Steel	N Non-Ferrous Metal	S Exotic Alloy
Internal Boring	Tool Grades	ACZ150/AC1030U	ACZ150/AC1030U	ACZ150/AC1030U	ACZ150/AC1030U
	Spindle Speed **n** (min^{-1})	2,000 to 10,000	2,000 to 8,000	5,000 to 15,000	2,000 to 6,000
	Depth of Cut **ap** (mm)	up to 0.2	up to 0.2	up to 0.2	up to 0.2
	Feed Rate **f** (mm/rev)	up to 0.05	up to 0.05	up to 0.05	up to 0.05

BSME series/SEXC series

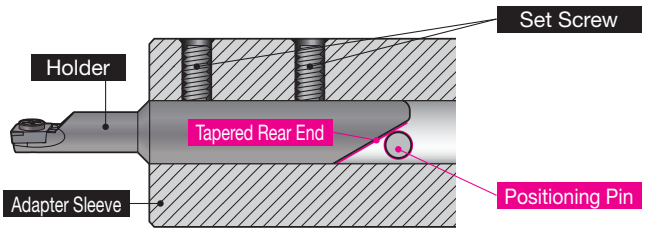
■ Features

- For internal boring of hardened steel with min. bore diameters from ø2.5mm.
- Achieves high-precision cutting edge positioning thanks to the newly developed clamp mechanism.
- Realises high-efficiency machining by switching from grinding to cutting in the small diameter range.
- Brazed type BSME series
  Can be used with bore diameters from ø2.5 to 5.0mm.
- Indexable Insert type SEXC series
  Can be used with bore diameters from ø4.0 to 6.0mm.
  Expansion of coated carbide and cermet grades.
- Economical 2-cornered insert.

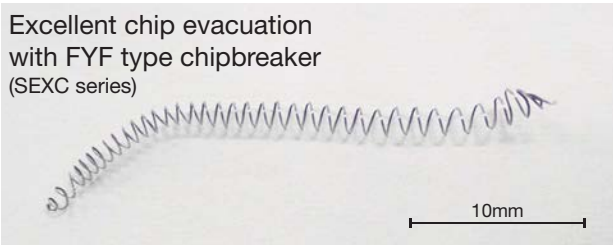
Brazed CBN type BSME series	Indexable Insert type SEXC series
Min. Bore Dia.: ø2.5 to 5.0mm	Min. Bore Dia.: ø4.0 to 6.0mm
High-quality, unique cutting edge shape  Internal Coolant Supply (Standard)	2-cornered insert used  Internal Coolant Supply (Standard)

Clamp Mechanism

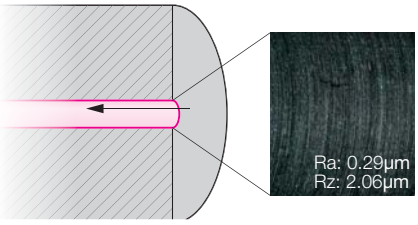
Achieves high-precision cutting edge positioning by combining a holder with a tapered rear end and a sleeve with an internal positioning pin.
(common to BSME and SEXC series)



Excellent chip evacuation with FYF type chipbreaker
(SEXC series)



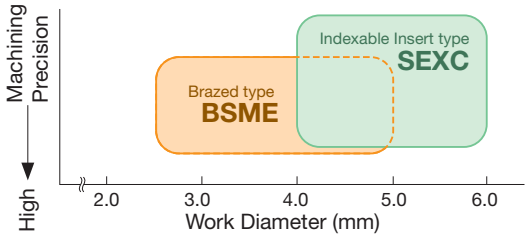
Excellent machined surface quality with cermet grade
(SEXC series)



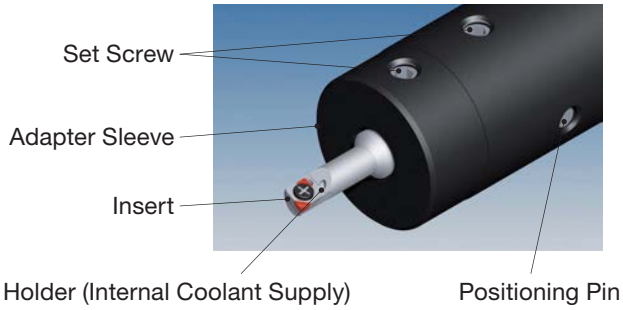
Work Material: SUS304 Internal Boring, Insert: ECEM 03X102L-FYF (AC1030U)
Cutting Conditions: vc = 100m/min, f = 0.05mm/rev, ap = 0.03mm, Work Dia.: ø4

Work Material: SCM415 Internal Boring, Insert: ECEM 03X102L-FYF (T1500A)
Cutting Conditions: vc = 100m/min f = 0.03mm/rev ap = 0.03mm

Application Range



Basic Configuration



BSME series

CBN

SUMIBORON
Brazed

SumiSmall

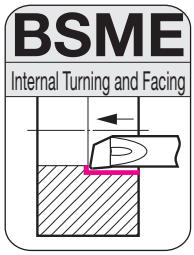


Fig 1

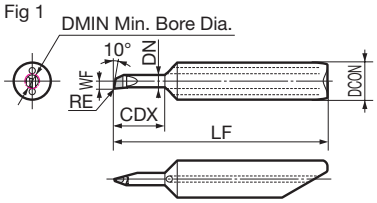
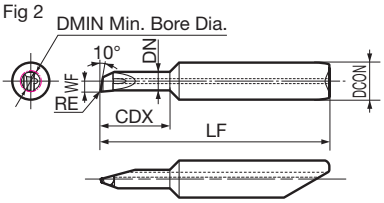


Fig 2



Holder (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000 R	BN2000 L	Min. Bore Dia. DMIN	Shank Diameter DCON	Neck Diameter DN	Overall Length LF	Cutting Edge Distance WF	Maximum Boring Depth CDX	Corner Radius RE	Applicable Sleeve	Fig
BSME R/L25020D2S6	●	●	**2.5**	6.0	2.0	32.0	1.20	5.3	0.2		1
BSME R/L25020D3S6	●	●	**2.5**	6.0	2.0	34.5	1.20	7.8	0.2		1
BSME R/L25020D4S6			**2.5**	6.0	2.0	37.0	1.20	10.3	0.2		1
BSME R/L30020D2S6	●	●	**3.0**	6.0	2.5	32.8	1.45	6.3	0.2		2
BSME R/L30020D3S6	●	●	**3.0**	6.0	2.5	35.8	1.45	9.3	0.2		2
BSME R/L30020D4S6			**3.0**	6.0	2.5	38.8	1.45	12.3	0.2		2
BSME R/L35020D2S6	●	●	**3.5**	6.0	3.0	33.5	1.70	7.3	0.2		2
BSME R/L35020D3S6	●	●	**3.5**	6.0	3.0	37.0	1.70	10.8	0.2		2
BSME R/L35020D4S6			**3.5**	6.0	3.0	40.5	1.70	14.3	0.2	HBSM6020	2
BSME R/L40020D2S6	●	●	**4.0**	6.0	3.5	33.9	1.95	8.3	0.2	HBSM6020A	2
BSME R/L40020D3S6	●	●	**4.0**	6.0	3.5	37.9	1.95	12.3	0.2		2
BSME R/L40020D4S6			**4.0**	6.0	3.5	41.9	1.95	16.3	0.2		2
BSME R/L45020D2S6	●	●	**4.5**	6.0	4.0	35.0	2.20	9.3	0.2		2
BSME R/L45020D3S6	●	●	**4.5**	6.0	4.0	39.5	2.20	13.8	0.2		2
BSME R/L45020D4S6			**4.5**	6.0	4.0	44.0	2.20	18.3	0.2		2
BSME R/L50020D2S6	●	●	**5.0**	6.0	4.5	35.8	2.45	10.3	0.2		2
BSME R/L50020D3S6	●	●	**5.0**	6.0	4.5	40.8	2.45	15.3	0.2		2
BSME R/L50020D4S6			**5.0**	6.0	4.5	45.8	2.45	20.3	0.2		2

The BSME series requires HBSM6020(A) adapter sleeve (sold separately).

Identification Code

BSM E R 350 20 D2 S6

Series Code	Carbide Shank with Oil Hole	Feed Direction	Min. Bore Dia.	Cutting Edge Corner Radius	L/D	Shank Dia.

Fig 1

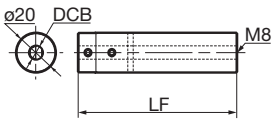
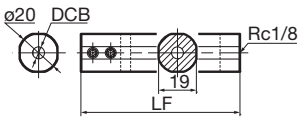


Fig 2



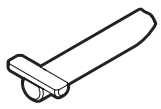
Sleeve (Sold Separately)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Overall Length LF	Fig	Set Screw	Wrench
HBSM6020	●	6.0	80	1	BT0506	TH025
HBSM6020A	●	6.0	80	2		

Mounting Method E77

Alignment Jig (Sold Separately) For HBSM6020 Sleeve

Cat. No.	Stock	
AFBSM60	●	

This jig is used for centring sleeves when setting them into sleeve holders.

Recommended Cutting Conditions

Work Material	H Hardened Steel	
Spindle Speed **n** (min^{-1})	Above 2,000	Above 2,000
Depth of Cut **ap** (mm)	0.01-0.15	0.01-0.15
Feed Rate **f** (mm/rev)	0.01-0.10	0.01-0.10

May cause chattering or chipping at the cutting edge during low-speed machining. Excessive depth of cut causes deformation of the tool, which consequently leads to deterioration of dimensional tolerance.

SEXC series

Expansion | Carbide (Coolant Hole) | CBN

Carbide / Cermet / SUMIBORON
Screw-on

SumiSmall

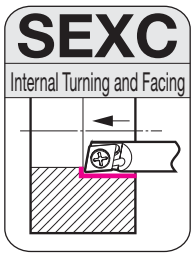
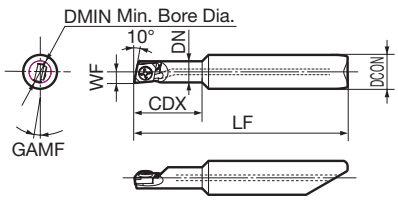


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Shank Diameter DCON	Neck Diameter DN	Overall Length LF	Cutting Edge Distance WF	Boring Depth CDX	Rake Angle GAMF	Applicable Sleeve	Fig	Bolt	Bolt N·m	Wrench
E06D2-SEXC R/L03-04P	●	●	**4.0**	6.0	3.75	33.75	1.95	8	-13°	HBSM6020 HBSM6020A	1	MIB1.6-2	0.2	SDBSM
E06D3-SEXC R/L03-04P	●	●	**4.0**	6.0	3.75	37.75	1.95	12	-13°		1			
E06D2-SEXC R/L03-05P	●	●	**5.0**	6.0	4.75	35.25	2.45	10	-12°		1	MIB1.6-2.5	0.2	
E06D3-SEXC R/L03-05P	●	●	**5.0**	6.0	4.75	40.25	2.45	15	-12°		1			
E06D2-SEXC R/L03-06P	●	●	**6.0**	6.0	5.75	36.75	2.95	12	-11°		1	MIB1.6-3	0.2	
E06D3-SEXC R/L03-06P	●	●	**6.0**	6.0	5.75	42.75	2.95	18	-11°		1			

The SEXC series requires HBSM6020(A) adapter sleeve (sold separately).

Identification Code

E 06 D2 - S E X C R 03 - 04 P

E	06	D2	S	E	X	C	R	03	04	P
Carbide Shank with Oil Hole	Shank Dia.	L/D	Screw-on	Insert Shape	Cutting Edge Shape	Insert Relief Angle	Feed Direction	Insert Inscribed Circle	Min. Bore Dia.	Accessories

Fig 1

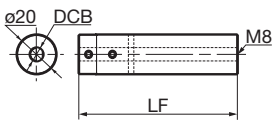
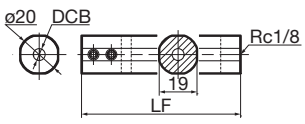


Fig 2



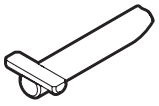
Sleeve (Sold Separately)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Overall Length LF	Fig	Set Screw	Wrench
HBSM6020	●	6.0	80	1	BT0506	TH025
HBSM6020A	●	6.0	80	2		

Mounting Method E77

Alignment Jig (Sold Separately) For HBSM6020 Sleeve

Cat. No.	Stock	
AFBSM60	●	

This jig is used for centring sleeves when setting them into sleeve holders.

Insert (Coated Carbide / SUMIBORON)

Dimensions (mm)

Cat. No.	AC1030U R	AC1030U L	T1500A R	T1500A L	BN2000	BN7000	Corner Radius RE	Fig
ECEM 03X1005 R/L-FYF New	●	●	●	●	—	—	0.05	1
ECEM 03X101 R/L-FYF New	●	●	●	●	—	—	0.1	1
ECEM 03X1015 R/L-FYF New	●	●	●	●	—	—	0.15	1
ECEM 03X102 R/ L-FYF New	●	●	●	●	—	—	0.2	1
2NU-ECXA 030X02 LE	—	—	—	—	●		0.2	2
2NU-ECXA 030X02 LF	—	—	—	—	●	●	0.2	2

Fig 1

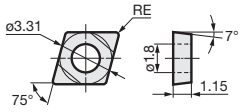
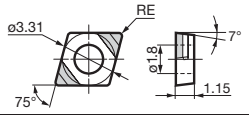


Fig 2



Part Number Suffix: LE: Honed Edge, LF: Sharp Edged, FYF: Sharp Edged (with Chipbreaker)

Recommended Cutting Conditions

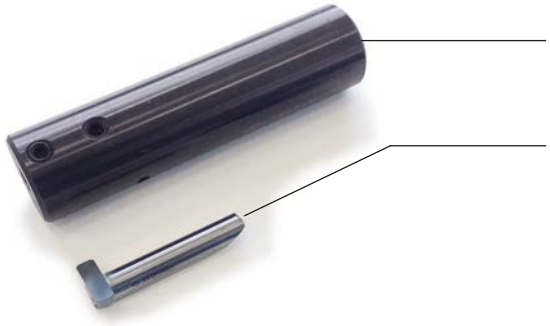
Work Material	P General Steel		M Stainless Steel		K Cast Iron		N Non-Ferrous Metal		S Exotic Alloy	H Hardened Steel	
Insert Grades	AC1030U	T1500A	AC1030U	T1500A	AC1030U	T1500A	AC1030U	T1500A	AC1030U	BN2000	BN7000
Spindle Speed n (min⁻¹)	2,000-10,000	2,000-10,000	2,000-8,000	2,000-8,000	2,000-10,000	2,000-10,000	5,000-15,000	5,000-15,000	2,000-6,000	Above 2,000	Above 2,000
Depth of Cut ap (mm)	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	0.01-0.15	0.01-0.15
Feed Rate f (mm/rev)	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	0.01-0.10	0.01-0.10

May cause chattering or chipping at the cutting edge during low-speed machining. Excessive depth of cut causes deformation of the tool, which consequently leads to deterioration of dimensional tolerance.

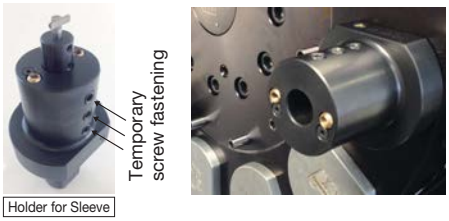
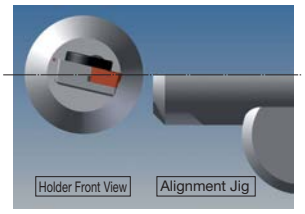
N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked Item (new product/expanded item)

BSME series/SEXC series

■ Dedicated Adapter Sleeve/Alignment Jig



■ Mounting Method (HBSM6020A has a side lock flat, so centring with an alignment jig is not required.)

1	Insert the alignment jig until it hits the positioning pin set in the adapter sleeve, and tighten the two set screws.	(2) Tighten the two set screws (1) Insert until it hits the positioning pin ⟹
2	Mount the sleeve into the sleeve holder and temporarily tighten the fastening screws.	 Temporary screw fastening Holder for Sleeve
3	Rotate the sleeve gradually to adjust until the flat strip of the alignment jig is horizontal. 	When a boring bar is mounted into the sleeve adjusted by the alignment tool, its cutting edge position will automatically be set at the centre.  Holder Front View Alignment Jig
4	Using a tool presetter, measure the diameter of the tool.	

*Steps 1 and 3 above are not required when using HBSM6020A.

BNBX series

Expansion | T 60° | 93° | CBN

SUMIBORON
Brazed

SumiSmall

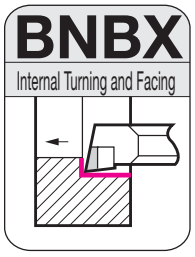
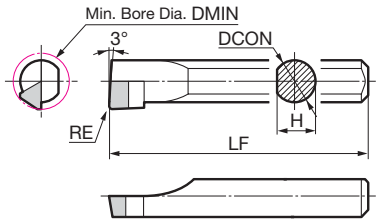


Fig 1



Holder (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000	BN7125 (New)	BN7000	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Corner Radius RE	Applicable Sleeve	Fig
BNBX 020R	●	○	●	**2.5**	2.0	1.8	40	0.2	HBX 2016	1
BNBX 025R	●	○	●	**3.0**	2.5	2.2	40	0.2	HBX 2516	1
BNBX 030R	●	○	●	**3.5**	3.0	2.7	40	0.2	HBX 3016	1
BNBX 035R	●	○	●	**4.0**	3.5	3.2	40	0.2	HBX 3516	1
BNBX 040R	●	○	●	**4.5**	4.0	3.7	40	0.2	HBX 4016	1
BNBX 045R	●	○	●	**5.0**	4.5	4.2	40	0.2	HBX 4516	1
BNBX 050R	●	○	●	**5.5**	5.0	4.7	60	0.2	HBX 5016	1
BNBX 055R	●	○	●	**6.0**	5.5	5.2	60	0.2	HBX 5516	1
BNBX 060R	●	○	●	**6.5**	6.0	5.7	60	0.2	HBX 6016	1
BNBX 065R	●			**7.0**	6.5	6.2	60	0.2	HBB 6516	1
BNBX 070R	●			**7.5**	7.0	6.7	80	0.2	HBB 716	1
BNBX 075R	●			**8.0**	7.5	7.2	80	0.2	HBB 7516	1
BNBX 080R	●			**8.5**	8.0	7.7	80	0.2	HBB 816	1

BNBX bars can be used with HBB type sleeves, but HBX type sleeves are recommended for bars below ø6mm.

Fig 1

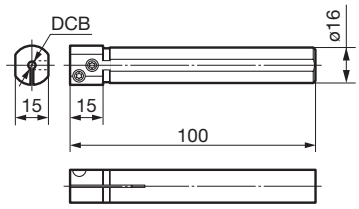
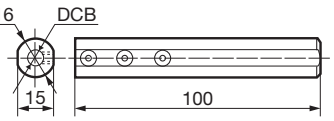


Fig 1



Sleeve (HBX type)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Tool Holder	Fig
HBX 2016	●	2.0	BNBX 020R	1
HBX 2516	●	2.5	BNBX 025R	1
HBX 3016	●	3.0	BNBX 030R	1
HBX 3516	●	3.5	BNBX 035R	1
HBX 4016	●	4.0	BNBX 040R	1
HBX 4516	●	4.5	BNBX 045R	1
HBX 5016	●	5.0	BNBX 050R	1
HBX 5516	●	5.5	BNBX 055R	1
HBX 6016	●	6.0	BNBX 060R	1

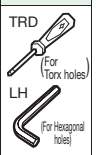
Sleeve (HBB type)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Tool Holder	Fig
HBB 6516	●	6.5	BNBX 065R	1
HBB 716	●	7.0	BNBX 070R	1
HBB 7516	●	7.5	BNBX 075R	1
HBB 816	●	8.0	BNBX 080R	1

HBB type sleeve can also be used with ø2.5 to 6.0mm holders.

Parts (for Adapter Sleeve)

Applicable Sleeve	Flat Insert Screw	N·m	Set Screw	Wrench
			BT06035T / BT0404	 TRD (For Torx holes) / LH (For Hexagonal holes)
HBX2○○○	BFTX0409N	**1.5**	BT06035T	TRD15
HBX3○○○	BFTX0409N	**3.0**	BT06035T	TRD15
HBX4○○○				
HBX5○○○				
HBX6○○○				
HBB○○○○	—	—	BT0404	LH020

N·m Recommended Tightening Torque (N·m) ○ mark: Stock or planned stock (please confirm stock availability)

BNZ series

Expansion | T 60° | 95° | CBN

SUMIBORON
Screw-on

SumiSmall

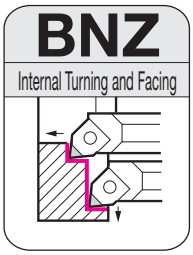
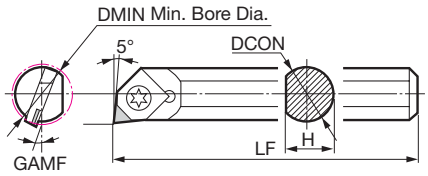


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Rake Angle GAMF	Fig	Flat Insert Screw		Wrench	Adapter Sleeve
									N·m	(For Torx hole)	
BNZ 606R	●	**7.0**	6.0	5.5	80	-14°	1	BFTX0204N	0.5	TRX06	HBB616
BNZ 608R	●	**9.0**	8.0	7.5	100	-12°	1				HBB816
BNZ 610R	●	**11.0**	10.0	9.5	125	-10°	1				—
BNZ 612R	●	**13.0**	12.0	11.0	130	-8°	1				
BNZ 616R	●	**17.0**	16.0	15.0	145	-6°	1				
BNZ 620R	●	**21.0**	20.0	19.0	160	-5°	1				

Insert (SUMIBORON)

Dimensions (mm)

Quantity	Cat. No.	BNC2010	BNC2020	BN1000	BN2000	BN7125 (New)	BN7000	Corner Radius RE
Single pack	**NU-ZNEX 040102**	—	—	●	●	○	●	0.2
	NU-ZNEX 040104	—	—	●	●	○	●	0.4
	NC-ZNEX 040102LE	●	—	—	—	—	—	0.2
	NC-ZNEX 040104LE	●	—	—	—	—	—	0.4
	NC-ZNEX 040102LT	—	●	—	—	—	—	0.2
	NC-ZNEX 040104LT	—	●	—	—	—	—	0.4
10 pack	**T-NU-ZNEX 040102**	—	—		●			0.2
	T-NU-ZNEX 040104	—	—		●			0.4

Fig 1

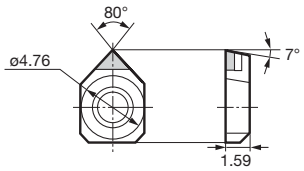
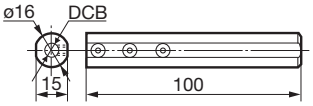


Fig 1



Sleeve

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Holder	Fig
HBB 616	●	6.0	BNZ 606R	1
HBB 816	●	8.0	BNZ 608R	1

HBX type sleeve (HBX6016) can also be used with BNZ606R.

BNB series

Expansion | T 60° | 92° | CBN | PCD

SUMIBORON
Clamp-on

SumiSmall

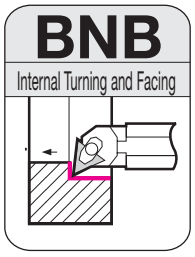


Fig 1

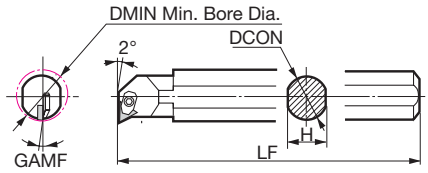


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

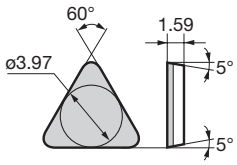
Cat. No.	Stock	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Rake Angle GAMF	Fig	Clamp Plate	Bolt	Nut	Wrench
											(For Hexagonal hole)
BNB 508R	●	**10.0**	8.0	7.0	140	-9°	1	BNBC	BH0306	BNBW-2	TH020
BNB 510R	●	**12.0**	10.0	9.0	140	-8°	1				
BNB 512R	●	**14.0**	12.0	11.0	160	-6°	1		FBUP3-A0-9	BNBW-4	
BNB 516R	●	**18.0**	16.0	14.0	180	-5°	1				
BNB 520R	●	**22.0**	20.0	18.0	180	-4°	1		BH0310	BNBW-7	

Insert (SUMIBORON, SUMIDIA)

Dimensions (mm)

Cat. No.	SUMIBORON (New) BNX10	BNX20	BN2000	BN350	BN500	BN7125	BN7000	SUMIDIA DA150	DA1000	Corner Radius RE
TBGN 060102B		●	●					●	●	0.2
TBGN 060104B	●	●	●	●	●	○	●	●	●	0.4
TBGN 060108B		●	●	●	●	○	●			0.8
TBGN 060102-BSTN*1	—	●	—	—	—	—	—	—	—	0.2
TBGN 060104-BSTN*1	—	●	—	—	—	—	—	—	—	0.4
TBGN 060108-BSTN*1	—	●	—	—	—	—	—	—	—	0.8
NF-TBGN 060102*2	—	—	—	—	—	—	—	—	●	0.2
NF-TBGN 060104*2	—	—	—	—	—	—	—	—	●	0.4

Fig 1



*1: TBGN ○○○○○○-BSTN is only available in BNX20 grade and has a smaller negative land angle. (BSTN: -15°, B: -25°. However, the negative land angle is uniquely configured for each grade.)
*2: NF-TBGN is a single corner insert. (This is not a Full-Top insert)

○ mark: Stock or planned stock (please confirm stock availability)

DABB series

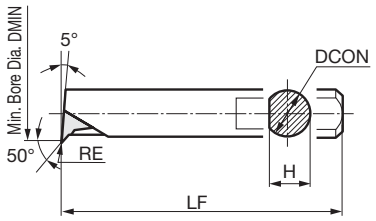
PCD

SUMIDIA
Brazed

DABB-C

Stop-Boring, Through-Boring and Back Chamfering

Fig 1



SumiSmall

Holder (SUMIDIA)

Dimensions (mm)

Cat. No.	DA2200	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Corner Radius RE	Applicable Sleeve	Fig
DABB 025CR	●	**3.0**	2.5	2.2	60	0.1	HBB 2516	1
DABB 035CR	●	**4.0**	3.5	3.2	60	0.1	HBB 3516	1
DABB 045CR	●	**5.0**	4.5	4.1	80	0.1	HBB 4516	1
DABB 060CR	●	**7.0**	6.0	5.2	80	0.1	HBB 616	1

PCD

SUMIDIA
Brazed

DABB-N

Stop-Boring, Through-Boring and Necking

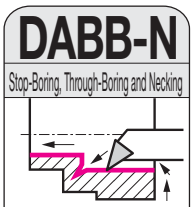
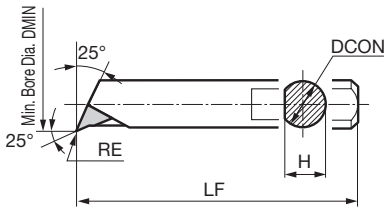


Fig 1



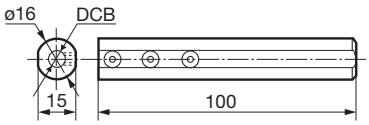
SumiSmall

Holder (SUMIDIA)

Dimensions (mm)

Cat. No.	DA2200	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Corner Radius RE	Applicable Sleeve	Fig
DABB 025NR	●	**3.0**	2.5	2.2	60	0.1	HBB 2516	1
DABB 035NR	●	**4.0**	3.5	3.2	60	0.1	HBB 3516	1
DABB 045NR	●	**5.0**	4.5	4.1	80	0.1	HBB 4516	1
DABB 060NR	●	**7.0**	6.0	5.2	80	0.1	HBB 616	1

Fig 1



Sleeve

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Fig	Set Screw	Wrench (For Hexagonal hole)
HBB 2516	●	2.5	1	BT0404	LH020
HBB 3516	●	3.5	1		
HBB 4516	●	4.5	1		
HBB 616	●	6.0	1		

HBX type sleeve can also be used.

Recommended Cutting Conditions

Work Material	Spindle Speed	Depth of Cut **ap**	Feed Rate **f**	Coolant
N Aluminum Alloy	Above 2,000 min^{-1}	0.1mm or below	0.1mm/rev or below	Wet

Clamp Set Parts

Parts

Applicable Clamp Set Cat. No.	Spring	Stock	Cap Screw	Stock	N·m
SCP-1	CSP08	●	CP-M5-20-1	●	
SCP-2	CSP08	●	CP-M5-20-1	●	
SCP-3	CSP08	●	CP-M5-20-1	●	5.0
SCP-4	CSP25	●	CP-M5-20-1	●	
SCP-5	CSP08	●	CP-M5-20-1	●	
SCP-6	CSP12	●	CP-M8-25-1	●	6.0

CP-M5-20-1 can also be fastened from the other end of the screw.

N·m Recommended Tightening Torque (N·m)

Grooving/Cut-off Threading Tools

F1 to F66

F

Grooving Tools

SEC-Grooving Tools GWC series
- SEC-Grooving Tool series Selection Guide F2
- GWC series (Shallow Grooves) F4
- GWCS type (Shallow Grooves) / GWCI type (Internal Shallow Grooves) ... F5

Chipbreaker Insert for GWC series
- Inserts for GWC series F6
- SumiTurn B-Groove BF type F8

SEC-Grooving Tools GND series
- GWC series Special Grooving Insert Request Form ... F9
- GND series Selection Guide F10
- GND series Recommended Cutting Conditions ... F19
- GNDM type / GNDL type (For Small Lathes) F24
- GNDM-J type / GNDL-J type (Internal Coolant Supply for Small Lathes) ... F26
- GNDS type (For Shallow Grooves) F28
- GNDM type / GNDMS type (For General-purpose) ... F30
- GNDM-J type (General-purpose Internal Coolant Supply) ... F32
- GNDL type / GNDLS type (For Deep Grooves) ... F34
- GNDL-J type (Deep Groove Internal Coolant Supply) ... F36
- New GNDXL type (Deep Grooves: Groove Depth up to 32mm) ... F38
- GNDN type (For Necking) F40
- GNDF type (General-purpose) F42
- GNDFS type (General-purpose) F44
- GNDIS type (For General-purpose Internal Grooves) ... F46
- GNDI type (For General-purpose Internal Grooves) ... F48
- GNDCM type (SumiPolygon) F50
- GND series Special Grooving Insert Request Form ... F52
- New GND series 90° Insert Request Form F53

External Grooving / Face Grooving / Internal Grooving
- SGE series (Wide Grooves) F54
- CKB series (For Very Small Diameter Grooves) ... F55
- CKB series (For Very Small Diameter Grooves) ... F56
- SGIT series (For Small Diameters) F57
- Expansion SSH series (For Small Diameters) F58

CBN
- SUMIBORON GWB series (For Hardened Steel, Shallow Grooves) ... F64
- SUMIBORON BNGG series (For Hardened Steel, Shallow Grooves) ... F65

F Cut-off Tools ···F67~

- SEC-Cut-off Tool Holder series Selection Guide F68
- SumiGrip Introduction F69
- SumiGrip Jr. F70
- SumiGrip F74
- SEC-Small Diameter Cut-off Tool Holders F78
- SEC-Cut-off Tool Holders F80

F Threading Tools ···F97~

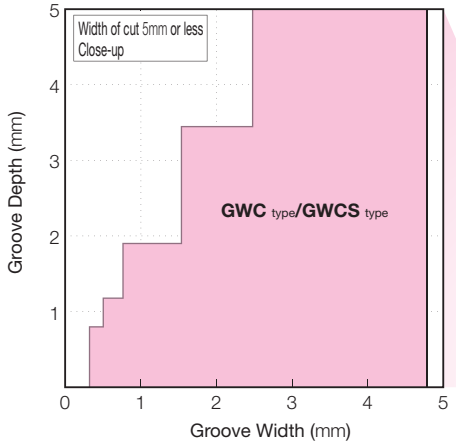
- SEC-Threading Tool series Selection Guide F98
- Basics of Threads F101
- For External/Internal Threading F102
- For External Threading F110
- For Internal Threading F115

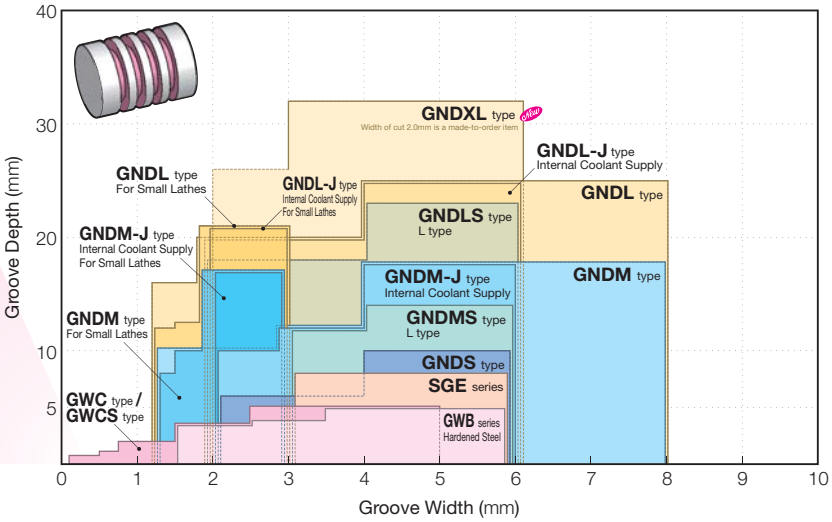
Stock Markings and Symbols

- ● ● mark: Standard stocked item
- ● mark: To be replaced with the new item featured on the same page
- ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
- * mark: Semi-standard stock (please confirm stock availability)
- ○ mark: Stock or planned stock (please confirm stock availability)
- Blank: Made-to-order item
- — mark: Not available

Selection Guide

External Grooving





■ External Grooving Tools

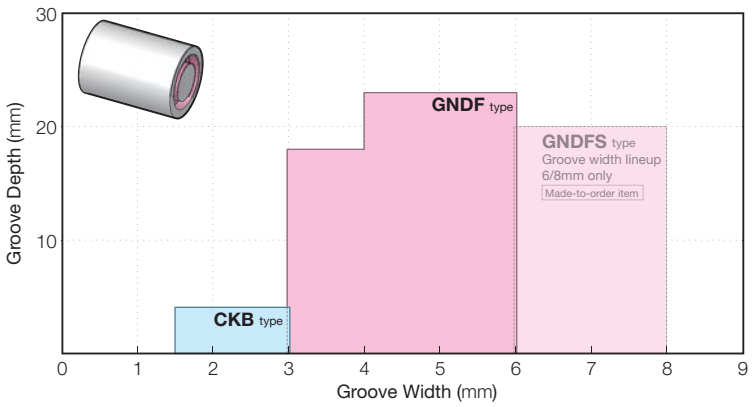
* mark: For groove depths and width combinations, refer to the above figures or the relevant page.

Applications	Series	Shape	Structure: Screw-on	Structure: Clamp-on	Structure: Double Clamp	Insert Shape (( ) indicates no. of cutting edges)	Groove Depth* / Groove Width*	Features
For Shallow Grooves	**GWC**	→ F4	●		●	(3) (Standard, with Chipbreaker) Traverse Cutting Possible	5.0 / 4.8 / 0.33	· High rigidity double clamping (Screw-on for Mini Holders) · Triangular type insert with 3 usable corners
	GWCS	→ F5			●		5.0 / 4.8 / 0.33	· "L-shaped" (side cut) GWC holder
	GWB*1 Hardened Steel	→ F64			●	(1) Traverse Cutting Possible	5.0 / 1.5 / 6.0	· High rigidity double clamping · Employs Coated SUMIBORON for interrupted turning of hardened steel
For Shallow Grooves to General Grooves	**SGE**	→ F54		●		(2) Traverse Cutting Possible	8.0 / 3.0 / 6.0	· Traverse cutting (groove expansion) is possible
	GNDS	→ F28		●			10.0 / 2.0 / 6.0	· High-rigidity design reduces vibration · Enables high-efficiency turning and traversing thanks to its short tool overhang length
	GNDM For Small Lathes	→ F24		●			17.0 / 1.25 / 3.0	· High-rigidity design reduces vibration · 16x16, 20x12mm square shanks available
	GNDM-J Internal Coolant Supply For Small Lathes	→ F26		●		(2)	17.0 / 1.25 / 3.0	· GNDM type with internal coolant supply for small lathes
	GNDM	→ F30		●		(2) Traverse Cutting Possible	18.0 / 1.25 / 8.0	· High-rigidity design reduces vibration · Perfect for traverse cutting and profiling
	GNDM-J Internal Coolant Supply	→ F32		●			18.0 / 2.0 / 6.0	· GNDM type with internal coolant supply
	GNDMS	→ F30		●			23.0 / 3.0 / 6.0	· "L-shaped" (side cut) GNDM type
For Deep Grooves	**GNDL** For Small Lathes	→ F24		●			21.0 / 1.25 / 3.0	· High-rigidity design reduces vibration · 10x10, 12x12, 16x16, 20x12mm square shanks available
	GNDL-J Internal Coolant Supply For Small Lathes	→ F26		●			21.0 / 1.25 / 3.0	· GNDL type with internal coolant supply for small lathes
	GNDL	→ F34		●		(2) (2)	25.0 / 1.25 / 8.0	· High-rigidity design reduces vibration · Perfect for grooving, deep grooving and cut-off applications
	GNDL-J Internal Coolant Supply	→ F36		●			25.0 / 2.0 / 6.0	· GNDL type with internal coolant supply
	GNDLS	→ F34		●			25.0 / 2.0 / 6.0	· "L-shaped" (side cut) GNDL type
	GNDXL New	→ F38		●		(1) (1)	32.0 / *2 2.0 / 6.0	· Supports a maximum grooving depth of 32mm.

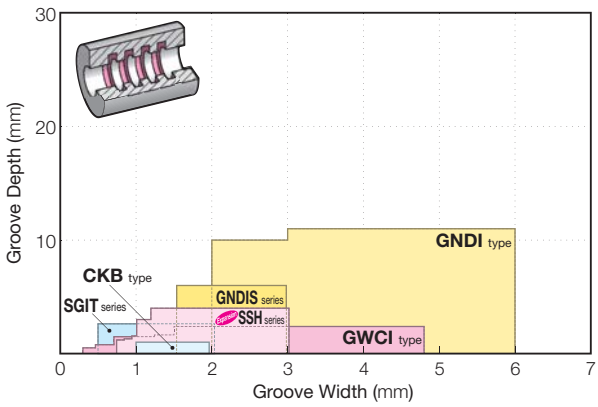
*1: For hardened steel, refer to page F65 for SUMIBORON Grooving Holder BNGG series. *2: Width of cut 2.0mm is a made-to-order item.

Selection Guide

Face Grooving



Internal Grooving



■ Face Grooving Tools

Note: * mark: For groove depths and width combinations, refer to the above figures or the relevant page.

Applications	Series	Shape	Structure: Screw-on	Structure: Clamp-on	Structure: Double Clamp	Insert Shape ( ) indicates no. of cutting edges	Groove Depth* / Groove Width*	Machining diameter (mm)	Features
Very Small Diameter	**CKB**	→ F55		●		(1)	Depth* 4.0 / Width* 1.5–3.0	ø6 ~	· Face grooving for small lathes
For General Grooves to Deep Grooves	**GNDF**	→ F42		●		(2)	Depth* 23 / Width* 3.0–6.0	ø35 to ø1,000	· High-rigidity design reduces vibration
	GNDFS Made-to-order item	→ F45		●		(2) Traverse Cutting Possible	Depth* 20 / Width* 6.0–8.0	ø70 ~	· L-shape (horizontal) type · For wide grooves

■ Internal Grooving Tools

* mark: For groove depths and width combinations, refer to the above figures or the relevant page.

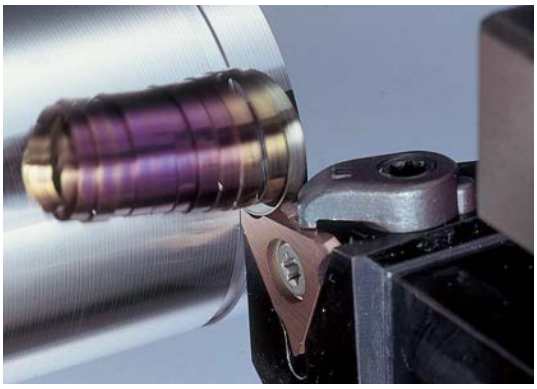
Applications	Series	Shape	Structure: Screw-on	Structure: Clamp-on	Structure: Double Clamp	Insert Shape ( ) indicates no. of cutting edges	Groove Depth* / Groove Width*	Min. bore diameter (mm)	Features
For Small Diameter Grooves	**CKB**	→ F56		●		(1)	Depth* 1.0 / Width* 1.0–2.0	ø4	· Very small diameter grooving · High clamping force · Wide variety of tool holders
	SGIT	→ F57	●			(3)	Depth* 3.2 / Width* 0.5–2.0	ø10	· 3-cornered type
	SSH Expansion	→ F58	●			(1) Traverse Cutting Possible	Depth* 4.0 / Width* 0.74–3.0	ø8	· Internal coolant supply for outstanding chip evacuation · Wide range of grooving widths · Tough carbide body for stable grooving
For Shallow Grooves	**GWCI**	→ F5	●			(3) (Standard, with Chipbreaker)	Depth* 2.5 / Width* 0.33–4.8	ø35	· Using same inserts as GWC series holders · Inserts with chipbreakers now in stock
For General Grooves to Deep Grooves	**GNDIS**	→ F46		●		(2) Traverse Cutting Possible	Depth* 6.6 / Width* 1.5–3.0	ø14	· Supports grooving with minimum bore diameter from ø14
	GNDI	→ F48		●		(2) (2) Traverse Cutting Possible	Depth* 11.0 / Width* 2.0–6.0	ø32	· High-rigidity design reduces vibration

■ Necking Tools

* mark: For groove depths and width combinations, refer to the above figures or the relevant page.

Applications	Series	Shape	Structure: Screw-on	Structure: Clamp-on	Structure: Double Clamp	Insert Shape ( ) indicates no. of cutting edges	Groove Depth* / Groove Width*	Machining diameter (mm)	Features
Facing Necking	**GNDN**	→ F40		●		(2)	Depth* 4.0 / Width* 2.0–6.0	ø20 ~	· Necking at corners possible

GWC series



Features of GWC series for Shallow Groove

- The same insert can be used for both external and internal grooving.
- Full range of insert grades to cover a wide range of work materials.
  Coated Carbide AC530U, Cemented Carbide H1,
  Coated Cermet T2500Z and T3000Z,
  Cermet T1500A,
  SUMIBORON BN2000, and
  SUMIDIA DA2200 are now in stock.
- A wide range of grooving widths from 0.33mm to 4.8mm.
- SumiTurn B-Groove inserts with chipbreaker are now in stock.
- Customers can modify the grooving width, corner radius and rake angle according to their own requirements using the grooving insert blanks. (Sumitomo Electric Hardmetal also accepts orders.)

External

External Shallow Grooves
Double Clamp / Screw-on

GWC
External Grooving

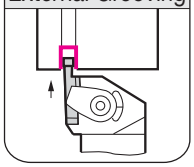


Fig 1

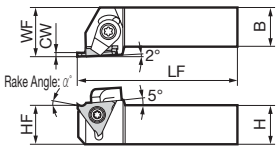


Fig 2

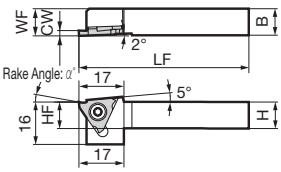


Fig 3

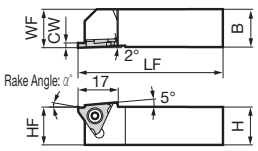
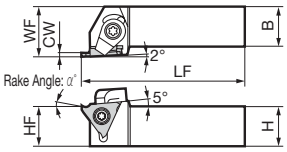


Fig 4



Note 1: Rake angle α° varies depending on the insert grade. Refer to the insert table on F5 for details.
Note 2: Figures show right hand (R) tools.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Width of Cut CW	Maximum Groove Depth	Group No.	Fig	Flat Head Screw	N·m	Wrench	Clamp Plate	Double Screw	N·m	Wrench
GWC R/L1010-3	●	●	10	10	125	10	10	**0.33 to 2.80**	**0.8 to 2.5**	1	2	BFTX0409N	3.4	TRX15	—	—	—	—
GWC R/L1212-3	●	●	12	12	125	12	12	**0.33 to 2.80**	**0.8 to 2.5**	1	2							
GWC R/L1616-3	●	●	16	16	125	16	16	**0.33 to 2.80**	**0.8 to 2.5**	1	3							
GWC R/L2020-3	●	●	20	20	125	25	20	**0.33 to 2.80**	**0.8 to 2.5**	1	1				CCM6B L/R	WB6-20 T/TL	5.0*	LT20
GWC R/L2525-3	●	●	25	25	150	30	25	**0.33 to 2.80**	**0.8 to 2.5**	1	1							
GWC R/L2020-15	●	●	20	20	125	25	20	**1.00 to 1.45**	**2.0**	2	4	BFTX0511N	5.0	TRX20	CCM8U L/R	WB8-22 T/TL	5.0*	LT27
GWC R/L2020-25	●	●	20	20	125	25	20	**1.50 to 2.30**	**3.5**	3	1							
GWC R/L2020-35	●	●	20	20	125	25	20	**2.50 to 4.80**	**5.0**	4	1							
GWC R/L2525-15	●	●	25	25	150	30	25	**1.00 to 1.45**	**2.0**	2	4							
GWC R/L2525-25	●	●	25	25	150	30	25	**1.50 to 2.30**	**3.5**	3	1							
GWC R/L2525-35	●	●	25	25	150	30	25	**2.50 to 4.80**	**5.0**	4	1							

* mark: Cermet inserts have a recommended tightening torque of 4N·m.
Right-handed (R) tool holders are used with right-handed (R) inserts.
* Refer to TGA type insert group numbers on F6, F7 and F8 for applicable inserts. Select applicable inserts for the holders by using matching group numbers.
* Right-handed (R) tool holders are compatible with left-handed clamp plates (CCM○□L) and right-handed double screws (WB○-2○T).
Left-handed (L) tool holders are compatible with right-handed clamp plates (CCM○□R) and left-handed double screws (WB○-2○TL).

N·m Recommended Tightening Torque (N·m)

GWCS type/GWCI type

External

Double Clamp for External L-Shaped (Side Cut) Shallow Grooves

GWCS External Grooving

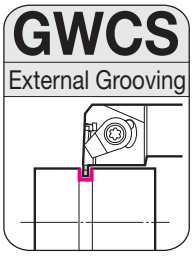
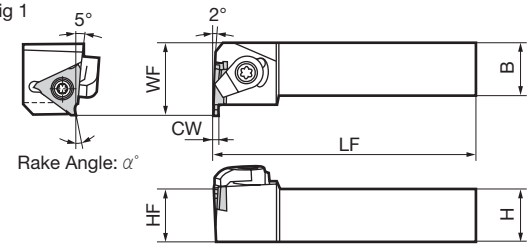


Fig 1



Note 1: Rake angle α° varies depending on the insert grade. Refer to the insert table at the bottom of this page for details.
Note 2: Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Width of Cut CW	Maximum Groove Depth	Group No.	Fig	Flat Head Screw	N·m	Wrench	Clamp Plate	Double Screw	N·m	Wrench
GWCS R/L2020-3	●	●	20	20	125	25	20	0.33 to 2.80	0.8 to 2.5	1	1	BFTX0409N	3.4	TRX15	CCM6B R/L	WB6-20 TL/T	5.0*	LT20
GWCS R/L2525-3	●	●	25	25	150	30	25	0.33 to 2.80	0.8 to 2.5	1	1							
GWCS R/L2020-15	●	●	20	20	125	27	20	1.00 to 1.45	2.0	2	1	BFTX0511N	5.0	TRX20	CCM8U R/L	WB8-22 TL/T	5.0*	LT27
GWCS R/L2020-25	●	●	20	20	125	27	20	1.50 to 2.30	3.5	3	1							
GWCS R/L2020-35	●	●	20	20	125	27	20	2.50 to 4.80	5.0	4	1							
GWCS R/L2525-15	●	●	25	25	150	32	25	1.00 to 1.45	2.0	2	1							
GWCS R/L2525-25	●	●	25	25	150	32	25	1.50 to 2.30	3.5	3	1							
GWCS R/L2525-35	●	●	25	25	150	32	25	2.50 to 4.80	5.0	4	1							

* mark: Cermet inserts have a recommended tightening torque of 4N·m.
Right-handed (R) tool holders are used with left-handed (L) inserts.
* Refer to TGA type insert group numbers on F6, F7 and F8 for GWCS type holder applicable inserts. Select applicable inserts for the holders by using matching group numbers.
* Right-handed (R) tool holders are compatible with right-handed clamp plates (CCM○□R) and left-handed double screws (WB○-2○TL). Left-handed (L) tool holders are compatible with left-handed clamp plates (CCM○□L) and right-handed double screws (WB○-2○T).

Internal

Screw-on for Internal Diameter Shallow Grooves

GWCI Internal Grooving

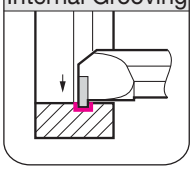
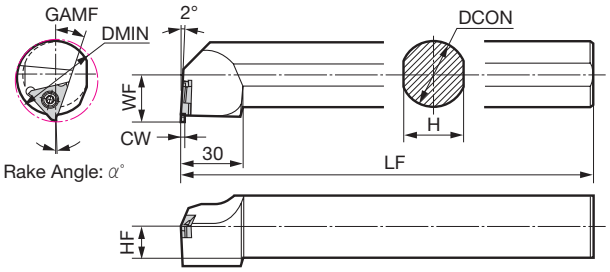


Fig 1



Note 1: Rake angle α° varies depending on the insert grade. Refer to the insert table at the bottom of this page for details.
Note 2: Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Min. Bore Dia. DMIN	Rake Angle GAMF	Width of Cut CW	Maximum Groove Depth	Group No.	Fig	Flat Head Screw	N·m	Wrench
GWCI R/L325	●	●	25	23	220	17.5	11.5	35	14°	**0.33 to 2.80**	**0.5 to 2.0**	1	1	BFTX0409N	3.4	TRX15
GWCI R/L432	●	●	32	30	250	23.0	15.0	40	16°	**1.25 to 4.80**	**1.7 to 2.5**	2/3/4	1	BFTX0511N	5.0	TRX20

Right-handed (R) tool holders are used with left-handed (L) inserts.
*Refer to TGA type insert group numbers on F6, F7 and F8 for GWCI type holder applicable inserts.

● Rake angle when mounted on a holder (α°)

	Coated Carbide AC530U	Carbide H1	Coated Cermet T2500Z T3000Z	Cermet T1500A	SUMIBORON BN2000	SUMIDIA DA2200
External Grooving GWC/GWCS	10°	20°	10°	5°	0°	10°
Internal Grooving GWCI R/L325	1°	11°	1°	-4°	-9°	1°
Internal Grooving GWCI R/L432	-1°	9°	-1°	-6°	-11°	-1°

N·m Recommended Tightening Torque (N·m)

TGA type

(Coated Carbide / Cermet / Cemented Carbide / SUMIBORON / SUMIDIA)

Fig 1

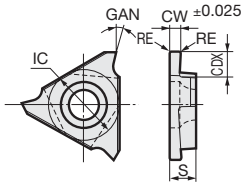
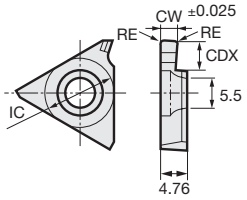


Fig 2 (For BN2000 / DA2200)



Grade		Cutting Edge Shape	GAN
Coated Carbide	AC530U	Honing	15°
Carbide	H1	Sharp Edged	25°
Coated Cermet	T2500Z	Honing	15°
Coated Cermet	T3000Z	Honing	15°
Cermet	T1500A	Sharp Edged	10°
SUMIBORON	BN2000	Negative Land	5°
SUMIDIA	DA2200	Sharp Edged	15°

* For the rake angle when fitted on the holder, refer to F5.

Square Edged Grooving Insert

Figure shows right-handed (R) tool.

Dimensions (mm)

Cat. No.	AC530U		H1		T2500Z		T3000Z		T1500A		BN2000		DA2200		Width of Cut	Maximum Depth of Cut		Maximum Groove Depth	Corner Radius	Inscribed Circle	Thickness	*Group No.	Fig
	R	L	R	L	R	L	R	L	R	L	R	L	R	L	CW	External	Internal	CDX	RE	IC	S		
TGA R/L3033(E)	●	●	●	●	●	●	▲	▲	●	●	—	—	—	—	0.33	0.8	0.5	1.0	0.05	9.525	3.18	1	1
TGA R/L3050(E)	●	●	●	●	●	●	▲	▲	●	●	—	—	—	—	0.50	1.2	0.8	1.4	0.05	9.525	3.18	1	1
TGA R/L3075(E)	●	●	●	●	●	●	▲	▲	●	●					0.75	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3095(E)	●	●	●	●	●	●	▲	▲	●	●					0.95	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3100(E)	●	●	●	●	●	●	▲	▲	●	●					1.00	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3110(E)	●	●			●	●	▲	▲	●	●					1.10	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3125(E)	●	●	●	●	●	●	▲	▲	●	●					1.25	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3135(E)	●	●			●	●	▲	▲	●	●					1.35	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3145(E)	●	●	●	●	●	●	▲	▲	●	●					1.45	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3150(E)	●	●	●	●	●	●	▲	▲	●	●					1.50	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3165(E)	●	●			●	●	▲	▲	●	●					1.65	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3175(E)	●	●			●	●	▲	▲	●	●					1.75	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3185(E)	●	●	●	●	●	●	▲	▲	●	●					1.85	2.0	1.5	2.5	0.1*3	9.525	3.18	1	1
TGA R/L3200(E)	●	●	●	●	●	●	▲	▲	●	●					2.00	2.5	2.0	3.0	0.1*3	9.525	3.18	1	1
TGA R/L3220(E)	●	●			●	●	▲	▲	●	●					2.20	2.5	2.0	3.0	0.1*3	9.525	3.18	1	1
TGA R/L3230(E)	●	●	●	●	●	●	▲	▲	●	●					2.30	2.5	2.0	3.0	0.1*3	9.525	3.18	1	1
TGA R/L3250(E)	●	●	●	●	●	●	▲	▲	●	●					2.50	2.5	2.0	3.0	0.1*3	9.525	3.18	1	1
TGA R/L3265(E)	●	●			●	●	▲	▲	●	●					2.65	2.5	2.0	3.0	0.1*3	9.525	3.18	1	1
TGA R/L3270(E)	●	●			●	●	▲	▲	●	●					2.70	2.5	2.0	3.0	0.1*3	9.525	3.18	1	1
TGA R/L3280(E)	●	●			●	●	▲	▲	●	●					2.80	2.5	2.0	3.0	0.1*3	9.525	3.18	1	1
TGA R/L4125(E)	●	●	●	●	●	●	▲	▲	●	●	●		●		1.25	2.0	1.7	2.5	0.2*2	12.70	4.76	2	1(2)
TGA R/L4145(E)	●	●	●	●	●	●	▲	▲	●	●					1.45	2.0	1.7	2.5	0.2*2	12.70	4.76	2	1
TGA R/L4150(E)	●	●	●	●	●	●	▲	▲	●	●	●		●		1.50	3.5	2.5	3.9	0.2*2	12.70	4.76	3	1(2)
TGA R/L4165(E)	●	●			●	●	▲	▲	●	●					1.65	3.5	2.5	3.9	0.2*2	12.70	4.76	3	1
TGA R/L4175(E)	●	●	●	●	●	●	▲	▲	●	●					1.75	3.5	2.5	3.9	0.2*2	12.70	4.76	3	1
TGA R/L4185(E)	●	●	●	●	●	●	▲	▲	●	●					1.85	3.5	2.5	3.9	0.2*2	12.70	4.76	3	1
TGA R/L4200(E)	●	●	●	●	●	●	▲	▲	●	●	●		●		2.00	3.5	2.5	3.9	0.2*2	12.70	4.76	3	1(2)
TGA R/L4220(E)	●	●			●	●	▲	▲	●	●					2.20	3.5	2.5	3.9	0.2*2	12.70	4.76	3	1
TGA R/L4230(E)	●	●	●	●	●	●	▲	▲	●	●					2.30	3.5	2.5	3.9	0.2*2	12.70	4.76	3	1
TGA R/L4250(E)	●	●	●	●	●	●	▲	▲	●	●	●		●		2.50	5.0*1	2.5	5.4*1	0.3*2	12.70	4.76	4	1(2)
TGA R/L4265(E)	●	●	●	●	●	●	▲	▲	●	●					2.65	5.0*1	2.5	5.4*1	0.3*2	12.70	4.76	4	1
TGA R/L4270(E)	●	●			●	●	▲	▲	●	●					2.70	5.0*1	2.5	5.4*1	0.3*2	12.70	4.76	4	1
TGA R/L4280(E)	●	●	●	●	●	●	▲	▲	●	●					2.80	5.0*1	2.5	5.4*1	0.3*2	12.70	4.76	4	1
TGA R/L4300(E)	●	●	●	●	●	●	▲	▲	●	●	●		●		3.00	5.0*1	2.5	5.4*1	0.3*2	12.70	4.76	4	1(2)
TGA R/L4320(E)	●	●			●	●	▲	▲	●	●					3.20	5.0*1	2.5	5.4	0.3*2	12.70	4.76	4	1
TGA R/L4330(E)	●	●	●	●	●	●	▲	▲	●	●					3.30	5.0*1	2.5	5.4	0.3*2	12.70	4.76	4	1
TGA R/L4350(E)	●	●	●	●	●	●	▲	▲	●	●	●		●		3.50	5.0	2.5	5.4	0.3*2	12.70	4.76	4	1(2)
TGA R/L4370(E)	●	●			●	●	▲	▲	●	●					3.70	5.0	2.5	5.4	0.3*2	12.70	4.76	4	1
TGA R/L4390(E)	●	●			●	●	▲	▲	●	●					3.90	5.0	2.5	5.4	0.3*2	12.70	4.76	4	1
TGA R/L4400(E)	●	●	●	●	●	●	▲	▲	●	●	●		●		4.00	5.0	2.5	5.4	0.4*2	12.70	4.76	4	1(2)
TGA R/L4410(E)	●	●			●	●	▲	▲	●	●					4.10	5.0	2.5	5.4	0.4*2	12.70	4.76	4	1
TGA R/L4420(E)	●	●			●	●	▲	▲	●	●					4.20	5.0	2.5	5.4	0.4*2	12.70	4.76	4	1
TGA R/L4430(E)	●	●	●	●	●	●	▲	▲	●	●					4.30	5.0	2.5	5.4	0.4*2	12.70	4.76	4	1
TGA R/L4440(E)	●	●			●	●	▲	▲	●	●					4.40	5.0	2.5	5.4	0.4*2	12.70	4.76	4	1
TGA R/L4450(E)	●	●	●	●	●	●	▲	▲	●	●					4.50	5.0	2.5	5.4	0.4*2	12.70	4.76	4	1
TGA R/L4480(E)	●	●	●	●	●	●	▲	▲	●	●					4.80	5.0	2.5	5.4	0.4*2	12.70	5.00	4	1

* Add E as the part number suffix for T1500A.
* Refer to F4 and F5 for group numbers of holders that can be used with the GWC, GWCS and GWCI Types. Select applicable inserts for the holders by using matching group numbers.
*1: CDX = 4.4 (maximum groove depth 4.0) for SUMIBORON and SUMIDIA (2.5 for internal boring)
*2: RE = 0.2 for SUMIBORON; RE = 0.1 for SUMIDIA
*3: T1500A is RE = 0.2

Recommended Cutting Conditions

Work Material	P General Steel			M Stainless Steel			N Non-Ferrous Metal		H Hardened Steel
Insert Grade	AC530U	T2500Z / T3000Z	T1500A	AC530U	T2500Z / T3000Z	T1500A	H1	DA2200	BN2000
Cutting Speed **vc** (m/min)	50 to 200	100 to 180	100 to 180	50 to 200	80 to 150	80 to 120	200 to 300	200 to 300	80 to 120
Feed Rate **f** (mm/rev)	0.02 to 0.10	0.05 to 0.10	0.05 to 0.08	0.02 to 0.10	0.05 to 0.08	0.05 to 0.08	0.05 to 0.15	0.05 to 0.15	0.03 to 0.07

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

TGA type

(Coated Carbide / Cermet / Cemented Carbide)

Fig 1

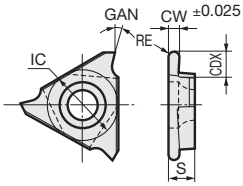


Figure shows right-handed (R) tool.

Grade		Cutting Edge Shape	GAN
Coated Carbide	AC530U	Honing	15°
Carbide	H1	Sharp Edged	25°
Coated Cermet	T2500Z	Honing	15°
Coated Cermet	T3000Z	Honing	15°
SUMIBORON	BN2000	Negative Land	5°
SUMIDIA	DA2200	Sharp Edged	15°

* For the rake angle when fitted on the holder, refer to F5.

Round Edged Grooving Insert

Dimensions (mm)

Cat. No.	AC530U R	AC530U L	H1 R	H1 L	T2500Z R	T2500Z L	T3000Z R	T3000Z L	Width of Cut CW	Maximum Depth of Cut External	Maximum Depth of Cut Internal	Maximum Groove Depth CDX	Corner Radius RE	Inscribed Circle IC	Thickness S	* Group No.	Fig
TGA R/L4050R	●	●	●	●	●		▲		**1.00**	**2.0**	**1.7**	2.5	0.50	12.70	4.76	2	1
TGA R/L4075R	●	●	●	●	●		▲		**1.50**	**3.5**	**2.5**	3.9	0.75	12.70	4.76	3	1
TGA R/L4100R	●	●	●	●	●		▲		**2.00**	**3.5**	**2.5**	3.9	1.00	12.70	4.76	3	1
TGA R/L4125R	●	●	●	●	●		▲		**2.50**	**5.0**	**2.5**	5.4	1.25	12.70	4.76	4	1
TGA R/L4150R	●	●	●	●	●		▲		**3.00**	**5.0**	**2.5**	5.4	1.50	12.70	4.76	4	1
TGA R/L4200R	●	●	●	●	●		▲		**4.00**	**5.0**	**2.5**	5.4	2.00	12.70	4.76	4	1

* Refer to F4 and F5 for group numbers of holders that can be used with the GWC, GWCS and GWCI Types. Select applicable inserts for the holders by using matching group numbers.

Recommended Cutting Conditions

Work Material	P General Steel			M Stainless Steel			N Non-Ferrous Metal		H Hardened Steel
Insert Grade	AC530U	T2500Z / T3000Z	T1500A	AC530U	T2500Z / T3000Z	T1500A	H1	DA2200	BN2000
Cutting Speed **vc** (m/min)	50 to 200	100 to 180	100 to 180	50 to 200	80 to 150	80 to 120	200 to 300	200 to 300	80 to 120
Feed Rate **f** (mm/rev)	0.02 to 0.10	0.05 to 0.10	0.05 to 0.08	0.02 to 0.10	0.05 to 0.08	0.05 to 0.08	0.05 to 0.15	0.05 to 0.15	0.03 to 0.07

Fig 1

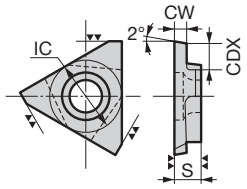
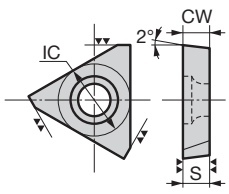


Fig 2



Insert Blank

(Uncompleted inserts: Width of cut, corner radius and rake angle modifications are required.)

(Cermet / Cemented Carbide)

Dimensions (mm)

Cat. No.	KH03 R	KH03 L	H1 R	H1 L	EH510 R	EH510 L	T1500A R	T1500A L	Width of Cut CW	Maximum Groove Depth CDX	Inscribed Circle IC	Thickness S	Fig
TGA R/L3-T18	●	●	●	●	●	●	●	●	1.85	(3.4)	9.525	3.18	1
TGA R/L3-T23	●	●	●	●	●	●	●	●	2.35	(3.4)	9.525	3.18	1
TGA R/L3-T31	●	●	●	●	●	●	●	●	3.18	—	9.525	3.18	2
TGA R/L4-T22	●	●	●	●	●	●	●	●	2.20	(4.8)	12.70	4.76	1
TGA R/L4-T37	●	●	●	●	●	●	●	●	3.75	(6.2)	12.70	4.76	1
TGA R/L4-T47	●	●	●	●	●	●	●	●	4.76	—	12.70	4.76	2

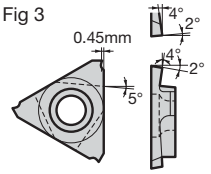
<Note> Figures in ( ) for CDX are reference values

Precautions when Modifying Inserts

When modifying the cutting edge, refer to the shapes in Fig 3 for the rake face, back taper, etc. Cutting edge specifications shown in Fig 4 are when the insert is mounted on the holder.

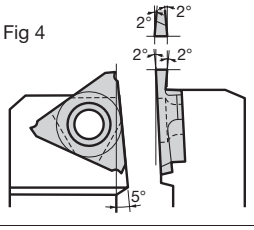
Recommended Modification

Fig 3



Cutting Edge Specifications When Mounted

Fig 4



● Ordering TGA type Blanks and Special Inserts

Sumitomo Electric Hardmetal also accepts orders for insert blanks. Use the "Special Grooving Insert Request Form" on F9 when ordering.

Use the "Special Grooving Insert Request Form" on F9 when ordering special inserts (with different shapes, widths of cut, and cutting edge lengths).

Make a copy of the form, fill it out and send it to a Sumitomo Electric Hardmetal dealer or distributor.

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SumiTurn B-Groove

■ General Features

SumiTurn B-Groove (BF type) inserts with chipbreaker have been added to the TGA type grooving insert lineup to solve chip control problems.

■ Features

- Achieves good chip control in a wide range of grooving processes.
- Good chip control during final wide groove touch-up with traverse cutting.
- Series covering grooving widths from 1.4mm to 4.5mm with a total of 60 stocked items.
- The AC530U grade for a longer tool life is now in stock to cover various work materials from steel and stainless steel to non-ferrous metals.

Fig 1

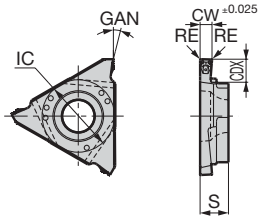
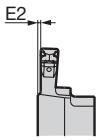


Fig 2



Grade		Cutting Edge Shape	GAN
Coated Carbide	AC530U	Honing	15°

* For the rake angle when fitted on the holder, refer to F5.

Note 1: Please note that inserts with edge width (CW) less than 1.85mm have different cutting edge distance (E2).
Note 2: Figure shows right-handed (R) tool.

B-Groove

Chipbreaker Insert for Square Grooves BF type (Coated Carbide) Dimensions (mm)

Cat. No.	AC530U R	AC530U L	Width of Cut CW	Max. Depth of Cut External	Max. Depth of Cut Internal	Maximum Groove Depth CDX	Corner Radius RE	Inscribed Circle IC	Thickness S	Cutting Edge Distance E2	Group No.	Fig
TGA R/L4140BF01	●	●	1.40	2.0	1.7	2.5	0.1	12.70	4.76	0.300	2	2
TGA R/L4165BF01	●	●	1.65	3.5	2.5	3.9	0.1	12.70	4.76	0.175	3	2
TGA R/L4190BF01	●	●	1.90	3.5	2.5	3.9	0.1	12.70	4.76	–	3	1
TGA R/L4220BF01	●	●	2.20	3.5	2.5	3.9	0.1	12.70	4.76	–	3	1
TGA R/L4270BF02	●	●	2.70	5.0	2.5	5.4	0.2	12.70	4.76	–	4	1
TGA R/L4320BF02	●	●	3.20	5.0	2.5	5.4	0.2	12.70	4.76	–	4	1
TGA R/L4420BF02	●	●	4.20	5.0	2.5	5.4	0.2	12.70	4.76	–	4	1
TGA R/L4150BF	●	●	1.50	3.5	2.5	3.9	0.2	12.70	4.76	0.250	3	2
TGA R/L4165BF	●	●	1.65	3.5	2.5	3.9	0.2	12.70	4.76	0.175	3	2
TGA R/L4175BF	●	●	1.75	3.5	2.5	3.9	0.2	12.70	4.76	0.125	3	2
TGA R/L4185BF	●	●	1.85	3.5	2.5	3.9	0.2	12.70	4.76	0.075	3	2
TGA R/L4200BF	●	●	2.00	3.5	2.5	3.9	0.2	12.70	4.76	–	3	1
TGA R/L4220BF	●	●	2.20	3.5	2.5	3.9	0.2	12.70	4.76	–	3	1
TGA R/L4230BF	●	●	2.30	3.5	2.5	3.9	0.2	12.70	4.76	–	3	1
TGA R/L4250BF	●	●	2.50	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4265BF	●	●	2.65	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4270BF	●	●	2.70	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4280BF	●	●	2.80	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4300BF	●	●	3.00	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4320BF	●	●	3.20	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4330BF	●	●	3.30	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4350BF	●	●	3.50	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4370BF	●	●	3.70	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4390BF	●	●	3.90	5.0	2.5	5.4	0.3	12.70	4.76	–	4	1
TGA R/L4400BF	●	●	4.00	5.0	2.5	5.4	0.4	12.70	4.76	–	4	1
TGA R/L4410BF	●	●	4.10	5.0	2.5	5.4	0.4	12.70	4.76	–	4	1
TGA R/L4420BF	●	●	4.20	5.0	2.5	5.4	0.4	12.70	4.76	–	4	1
TGA R/L4430BF	●	●	4.30	5.0	2.5	5.4	0.4	12.70	4.76	–	4	1
TGA R/L4440BF	●	●	4.40	5.0	2.5	5.4	0.4	12.70	4.76	–	4	1
TGA R/L4450BF	●	●	4.50	5.0	2.5	5.4	0.4	12.70	4.76	–	4	1

Recommended Cutting Conditions

Work Material	Machining Details	Cutting Conditions		Groove Width CW (mm) 1.4 to 2.3	2.5 to 3.3	3.5 to 4.5
General Steel P	Cutting Speed vc (m/min)			50 to 180	50 to 180	50 to 180
	Grooving	Feed Rate f (mm/rev)		0.03 to 0.12	0.04 to 0.12	0.05 to 0.12
		Depth of Cut ap (mm)	External	up to 3.5	up to 5.0	up to 5.0
			Internal	up to 2.5	up to 2.5	up to 2.5
	Traverse Cutting	Feed Rate f (mm/rev)		0.03 to 0.10	0.05 to 0.10	0.07 to 0.12
		Depth of Cut ap (mm)		up to 0.3	up to 0.5	up to 0.7
Stainless Steel M	Cutting Speed vc (m/min)			50 to 160	50 to 160	50 to 160
	Grooving	Feed Rate f (mm/rev)		0.03 to 0.12	0.04 to 0.12	0.05 to 0.12
		Depth of Cut ap (mm)	External	up to 3.5	up to 5.0	up to 5.0
			Internal	up to 2.5	up to 2.5	up to 2.5
	Traverse Cutting	Feed Rate f (mm/rev)		0.03 to 0.10	0.05 to 0.10	0.07 to 0.12
		Depth of Cut ap (mm)		up to 0.3	up to 0.5	up to 0.7

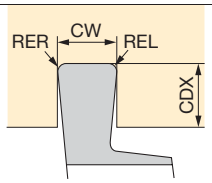
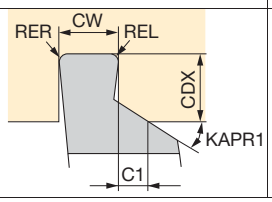
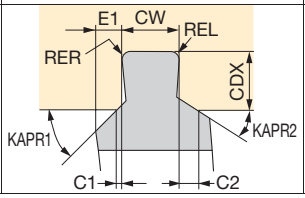
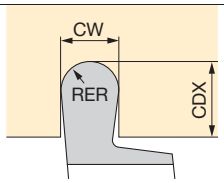
* Refer to F4 and F5 for group numbers of holders that can be used with the GWC, GWCS and GWCI Types.
Select applicable inserts for the holders by using matching group numbers.

GWC series Special Grooving Insert Request Form

Applies to the GWC type (page F4), GWCS type (page F5) and GWCI type (page F5) inserts.

To order special grooving inserts, fill out the form below (indicate your preference by circling the item or specify dimensions), and send it to a Sumitomo Electric Hardmetal dealer or distributor. (Make a copy of this form.)
For grooving inserts with shape, width of cut or grade other than those listed below, contact your nearest Sumitomo Electric Hardmetal sales office (refer to the back of this catalog).

Your Company / Contact Information (Phone / Fax / Address, etc.)

Cat. No.	(1)	(2)	(3)*	(4)
Shape				
Uses	Internal Grooving/External Grooving			
Holders	GWC type (page F4)/GWCS type (page F5)/GWCI type (page F5)			
Direction	Right Hand (R)/Left Hand (L)			
Insert Size	"3": ø9.525 "4": ø12.70			
CW				
CDX				
C1				
C2				
E1				
RER				
REL				
KAPR1				
KAPR2				
Grade				
Quantity				
Remarks				

*Inquire about applicable holders.

Form instructions

1. The above illustration shows only external right-hand and internal left-hand inserts.
   (The external left-hand and internal right-hand inserts will be opposite to the above illustration.)
2. The following two insert sizes are available.
   3: Inscribed circle 9.525mm
   4: Inscribed circle 12.70mm
3. Dimension limits for groove width and groove depth.
   (1) Maximum Width of Cut (CW): 4.8mm
   · For Models (1) and (4) : CW ≤ 4.8 (SumiTurn B-Groove (BF type) is 4.5mm)
   · For Model (2) : CW + C1 ≤ 4.8 (SumiTurn B-Groove (BF type) is 4.5mm)
   · For Model (3) : CW + E1 (or C1) + C2 ≤ 4.8 (SumiTurn B-Groove (BF type) is 4.5mm)
   (2) Minimum Width of Cut (CW) · For Insert Size "3": CW ≥ 0.33mm
   · For Insert Size "4": CW ≥ 0.75mm
   (3) Groove Depth (CDX) · For Insert Size "3": CDX ≤ 0.8 to CDX ≤ 2.5mm (For I.D.: CDX ≤ 0.8 to CDX ≤ 2.0)
   · For Insert Size "4": CDX ≤ 2.0 to CDX ≤ 5.0mm (For I.D.: CDX ≤ 2.0 to CDX ≤ 2.5)
4. SumiTurn B-Groove (BF type) grooving inserts with chipbreaker are limited to insert size 4 and AC530U grade.
   For shape details, please contact us directly.
5. The following shows the standard tolerance for inserts.

Symbol	Standard Tolerance
CW	±0.025mm
CDX	±0.05mm
KAPR1, KAPR2	±1°

Unless otherwise specified, inserts are made to standard tolerances.
6. Insert grades are based on the catalogue numbers in stock.
7. The applicable tool holders for Models (1), (2) and (4) should match the CW dimension. Contact us for Model (3).

GND series

VIDEO OF CUTTING

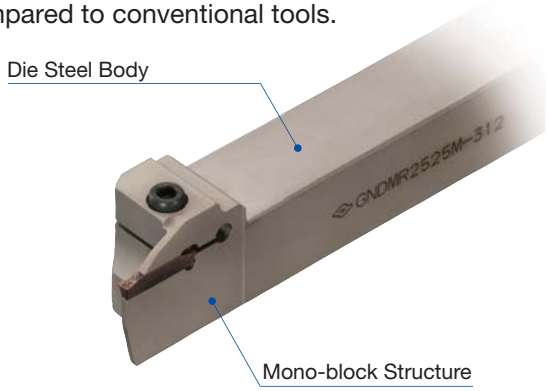
■ Features

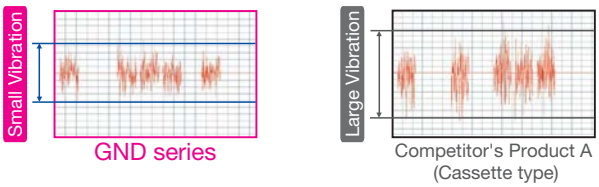
- **Suitable for a wide variety of applications**
  Applicable for grooving, traverse cutting, profiling, necking, facing and internal boring
- **Stable tool life**
  A variety of chipbreakers improve chip control in various applications
  Prevents sudden fractures due to chip clogging
- **Achieving high-efficiency turning with reduced chattering**
  The mono-block structure and die steel body reduce vibration during turning around 30% compared to conventional tools
- **Higher edge width precision even with unground inserts**
  High-precision sintering technology achieves width of cut precision of ±0.03mm for widths from 1.25 to 6.0mm (lead angle of 0° or 5°)

■ Cutting Performance

Reduced chattering

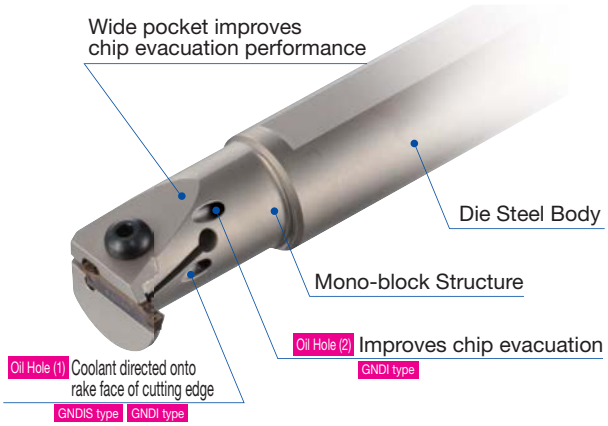
High-rigidity design reduces chattering by up to 30% as compared to conventional tools.

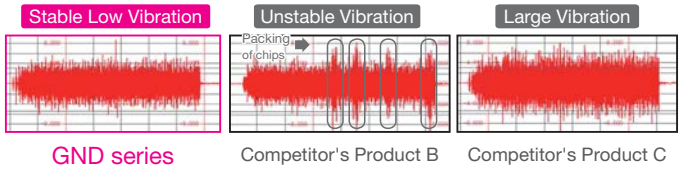




Work Material: SCM415
Holder: GNDL R2525M-220 Insert: GCM N2002-GG
Cutting Conditions: vc = 100m/min, f = 0.10mm/rev, ap = 20.0mm Wet

Both high rigidity and good chip evacuation performance Internal Grooving



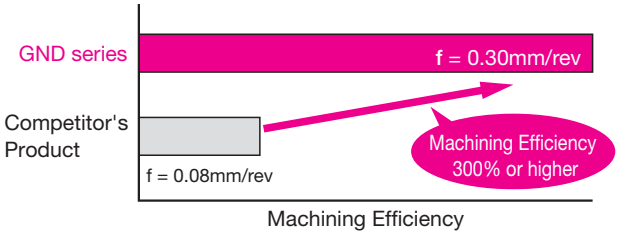


Work Material: SCM415
Holder: GNDI R2532-T306 Insert: GCM N3002-GG
Cutting Conditions: vc = 100m/min, f = 0.05mm/rev, ap = 3.0mm Wet

■ Application Examples

Substantially improved machining efficiency

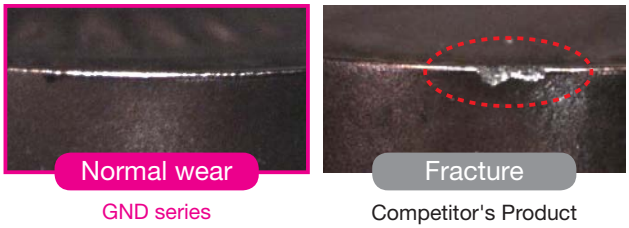
High-rigidity holder enables turning at high feed rates



Work Material: SCM435
Holder: GNDL R2525M-320 Insert: GCM N3002-GG (AC530U)
Cutting Conditions: vc = 130m/min, f = 0.30mm/rev Wet

Long, stable tool life ensures reliable functionality even on automatic production lines!

Reduction of chattering prevents unexpected breakage

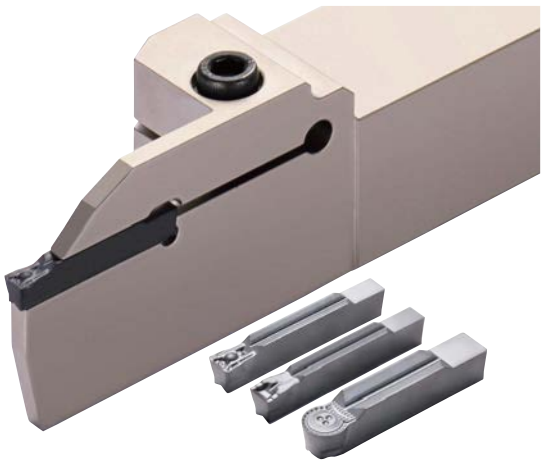


Work Material: S53C
Holder: GNDM L2525M-618 Insert: GCM N6030-RG (AC530U)
Cutting Conditions: vc = 130m/min, f = 0.3mm/rev Wet

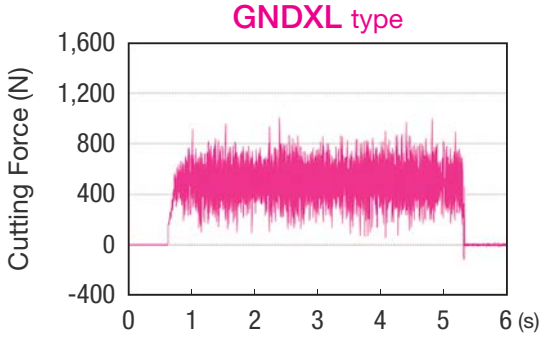
GND series

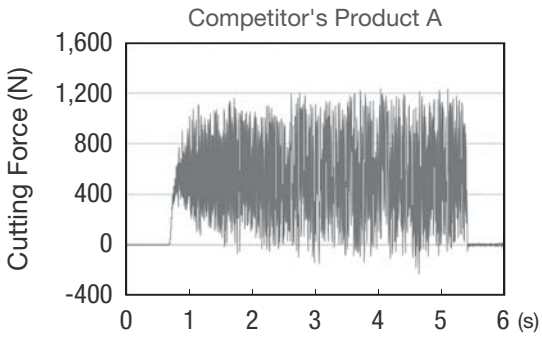
■ New Holders for Deep Grooves GNDXL type New

- SEC-Grooving Tools GND series now feature holders for deep grooves with groove depth up to 32mm
- Integrated high-rigidity body and insert realise superb vibration resistance with extra-strong clamp-on specifications
- Shank width lineup includes 20mm square and 25mm square
- Dedicated 1-cornered inserts for deep grooving with widths of cut from 3.0 to 6.0mm are stocked (2.0mm is a made-to-order item)
- Chipbreaker lineup includes ML type / GF type / RN type



- Vibration Resistance



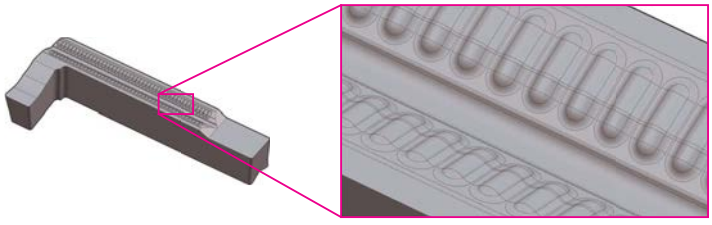


Work Material: SUS316 Holder: GNDXL R2525M-332 Insert: GCMN3002-GF1 (AC530U) Cutting Conditions: vc = 100m/min f = 0.10mm/rev ap = 10mm Wet (External Coolant Supply)

■ 90° Insert for Special Grooving (Made-to-order item) New

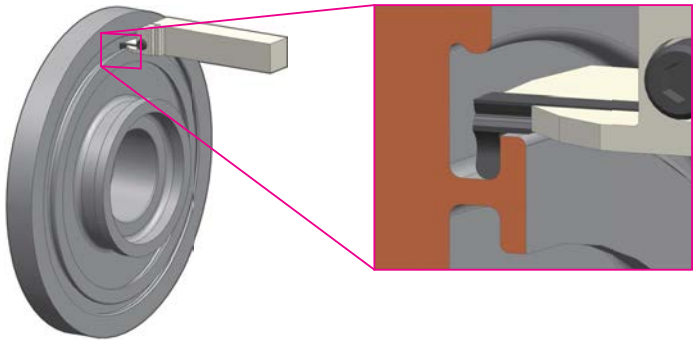
- Ideal for grooving in narrow spaces
- Widths of cut from 2.0 to 5.0mm available as made-to-order items
- Various cutting edge designs possible with ground type inserts
- Utilises an unique insert fallout prevention design

GND series 90° Insert Request Form F53



Grip effect for extra-strong clamping

Usage Example: Aerospace Engine Disc



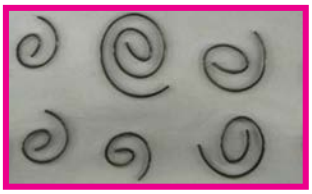
GND series

■ Achieving stability and longer tool life ... A variety of chipbreakers ensure outstanding chip evacuation performance in many different types of applications.

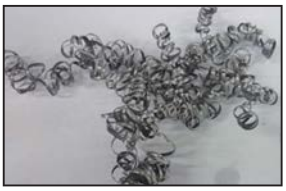
Grooving / Traverse Cutting		Grooving / Cut-off			Cut-off		Profiling	Profiling Necking	Non-Ferrous Metals
General-purpose	Low Feed	General-purpose	Low Feed	Low Cutting Force	General-purpose	Low Cutting Force	General-purpose	General-purpose	General-purpose
MG type	ML type	GG type	GL type	GF type	CG type	CF type	RG type	RN type	GA type
Standard chipbreaker for traverse cutting	For low-feed chip control	1st recommendation for grooving	For low-feed chip control	For low cutting force and chip control at low-feeds	1st recommendation for cut-off machining	For low-feed chip control	For external profiling and radius grooving	For facing, internal profiling, radius grooving and necking	Ideal for aluminum alloy machining
Cutting Edge Cross Section: 0.10, 15°	Cutting Edge Cross Section: 0.05, 20°	Cutting Edge Cross Section: 0.10, 20°	Cutting Edge Cross Section: 0.10, 20°	Cutting Edge Cross Section: 30°	Cutting Edge Cross Section: Lead Angle: 5°, 25°	Cutting Edge Cross Section: Lead Angle: 10° / 15°, 25°	Cutting Edge Cross Section: 0.05, 25°	Cutting Edge Cross Section: 0.05, 25°	Cutting Edge Cross Section: 20°
Edge Widths in Stock (mm)									
1.25 1.5 2.0	1.25 1.5 2.0	1.25 1.5 2.0	1.25 1.5 2.0	1.25 1.5 2.0	1.25 1.5 2.0	1.25 1.5 2.0	1.25 1.5 2.0	1.25 1.5 2.0	1.25 1.5 2.0
3.0 4.0 5.0	3.0 4.0 5.0	3.0 4.0 5.0	3.0 4.0 5.0	3.0 4.0 5.0	3.0 4.0 5.0	3.0 4.0 5.0	3.0 4.0 5.0	3.0 4.0 5.0	3.0 4.0 5.0
6.0 7.0 8.0	6.0 7.0 8.0	6.0 7.0 8.0	6.0 7.0 8.0	6.0 7.0 8.0	6.0 7.0 8.0	6.0 7.0 8.0	6.0 7.0 8.0	6.0 7.0 8.0	6.0 7.0 8.0
Stocked Grades									
AC8025P AC8035P	AC8025P AC8035P	AC8025P AC8035P	AC8025P AC8035P	AC8025P AC8035P	AC8025P AC8035P	AC8025P AC8035P	AC8025P AC8035P	AC8025P AC8035P	AC8025P AC8035P
AC830P AC425K	AC830P AC425K	AC830P AC425K	AC830P AC425K	AC830P AC425K	AC830P AC425K	AC830P AC425K	AC830P AC425K	AC830P AC425K	AC830P AC425K
AC5015S AC5025S	AC5015S AC5025S	AC5015S AC5025S	AC5015S AC5025S	AC5015S AC5025S	AC5015S AC5025S	AC5015S AC5025S	AC5015S AC5025S	AC5015S AC5025S	AC5015S AC5025S
AC520U AC530U	AC520U AC530U	AC520U AC530U	AC520U AC530U	AC520U AC530U	AC520U AC530U	AC520U AC530U	AC520U AC530U	AC520U AC530U	AC520U AC530U
AC1030U T2500A	*AC1030U T2500A	AC1030U T2500A	AC1030U T2500A	*AC1030U T2500A	AC1030U T2500A	AC1030U T2500A	AC1030U T2500A	AC1030U T2500A	AC1030U T2500A
H10	H10	H10	H10	H10	H10	H10	H10	H10	H10
	*: GNDIS type Only			*: GNDIS type Only	Lead Angle: 5°	Lead Angle: 10° / 15°			

■ Improved Chip Control

Grooving



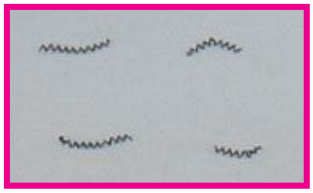
GND series
(GG type Chipbreaker)



Conventional Tool

Work Material: SCM415
Holder: GNDL R2525M-320, Insert: GCM N3002-GG
Cutting Conditions: vc = 100m/min, f = 0.15mm/rev, ap = 12.0mm Wet

Traverse cutting



GND series
(ML type Chipbreaker)

Conventional Tool

Work Material: SCM415
Holder: GNDM R2525M-312 Insert: GCM N3002-ML
Cutting Conditions: vc = 100m/min, f = 0.10mm/rev, ap = 0.5mm Wet

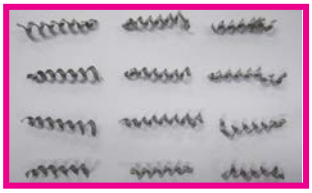
Cut-off

GND series
(CG type Chipbreaker)

Competitor's Product

Work Material: SUS316 (ø30mm)
Holder: GNDL R2525M-220 Insert: GCM R2002-CG-05
Cutting Conditions: vc = 100m/min, f = 0.15mm/rev Wet

Profiling



GND series
(RG type Chipbreaker)

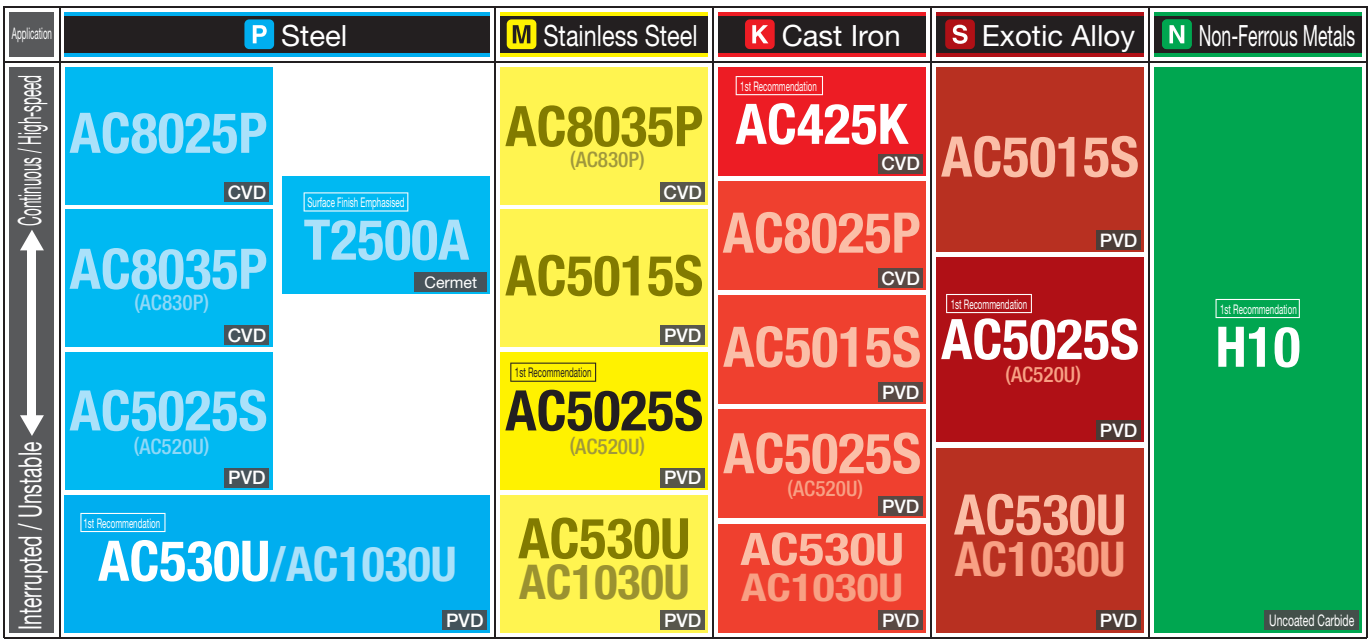
Conventional Tool

Work Material: SCM415
Holder: GNDM R2525M-312 Insert: GCM N3015-RG
Cutting Conditions: vc = 100m/min, f = 0.15mm/rev, ap = 0.1mm Wet

GND series

■ Chipbreaker Selection

■ Insert Grade Selection



Only AC520U and AC1030U inserts are stocked for GNDIS type holders.

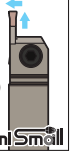
GND series

For External Machining (For Small Lathes)

SumiSmall

Traverse Cutting / Profiling (Cut-off)

GNDM type Straight type

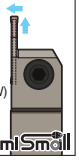


Shank Size (H x W)
16 × 16mm
20 × 12mm
F24

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

GNDM-J type Internal Coolant Supply, Straight type



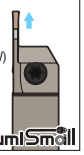
Shank Size (H x W)
16 × 16mm
20 × 12mm
F26

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

Grooving / Cut-off (Traverse Cutting)

GNDL type Straight type

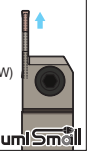


Shank Size (H x W)
10 × 10mm
12 × 12mm
16 × 16mm
20 × 12mm
F24

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

GNDL-J type Internal Coolant Supply, Straight type



Shank Size (H x W)
12 × 12mm
16 × 16mm
20 × 12mm
F26

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

For External Machining For Small Lathes series

MG : Multi-functional / General-purpose type
ML : Multi-functional / Low-feed type
GG : Grooving / General-purpose type
GL : Grooving / Low-feed type
GF : Grooving / Low cutting force type
CG : Cut-off / General-purpose type
CF : Cut-off / Low cutting force type
RG : Profiling / General-purpose type
RN : Facing / Necking / General-purpose type
GA : Non-Ferrous Metal / General-purpose type

Type	Shank Size (mm) Height (H)	Shank Size (mm) Width (B)	Width of Cut (mm)	Series	Max. Groove Depth (mm)	Ref. Page	MG	ML	GG	GL	GF	CG	CF	RG	RN	GA
For Small Lathes	10	10	1.25 1.5	GNDL	10	F24					◎					
			2	GNDL	10	F24		○	◎	◎	◎	◎	◎		◎	◎
			3	GNDL	10	F24	○	○	◎	◎	◎	◎	◎	◎	○	◎
	12	12	1.25 1.5	GNDL	12	F24					◎					
			2	GNDL	12.5	F24		○	◎	◎	◎	◎	◎		◎	◎
			2	GNDL-J (Internal Coolant Supply)	12.5	F26		○	◎	◎	◎	◎	◎		◎	◎
			3	GNDL	12.5	F24	○	○	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDL-J (Internal Coolant Supply)	12.5	F26	○	○	◎	◎	◎	◎	◎	◎	○	◎
	16	16	1.25	GNDM	8	F24					◎					
			1.25 1.5	GNDL	12.5	F24					◎					
			1.5	GNDM	10	F24					◎					
			2	GNDM	12	F24		◎	◎	◎	◎	◎	◎		◎	◎
			2	GNDM-J (Internal Coolant Supply)	12	F26		◎	◎	◎	◎	◎	◎		◎	◎
			2	GNDL	16	F24		○	◎	◎	◎	◎	◎		◎	◎
			2	GNDL-J (Internal Coolant Supply)	16	F26		○	◎	◎	◎	◎	◎		◎	◎
			3	GNDM	12	F24	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDM-J (Internal Coolant Supply)	12	F26	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDL	16	F24	○	○	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDL-J (Internal Coolant Supply)	16	F26	○	○	◎	◎	◎	◎	◎	◎	○	◎
	20	12	2	GNDM	17	F24		◎	◎	◎	◎	◎	◎		◎	◎
			2	GNDM-J (Internal Coolant Supply)	17	F26		◎	◎	◎	◎	◎	◎		◎	◎
			2	GNDL	21	F24		○	◎	◎	◎	◎	◎		◎	◎
			2	GNDL-J (Internal Coolant Supply)	21	F26		○	◎	◎	◎	◎	◎		◎	◎
			3	GNDM	17	F24	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDM-J (Internal Coolant Supply)	17	F26	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDL	21	F24	○	○	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDL-J (Internal Coolant Supply)	21	F26	○	○	◎	◎	◎	◎	◎	◎	○	◎

■ : In Stock

◎: Best ○: Suitable

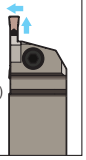
GND series

For External Machining (Straight type Groove Depth up to 25mm)

For External Machining (Straight Edge type Groove Depth up to 32mm)

Traverse Cutting / Profiling (Cut-off)

GNDS type Straight type — For Shallow Grooves

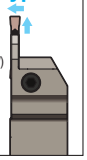


Shank Size (H x W)
20 × 20mm
25 × 25mm
F28

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

GNDM type Straight type

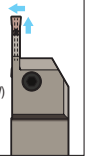


Shank Size (H x W)
20 × 20mm
25 × 25mm
32 × 25mm
32 × 32mm
F30

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

GNDM-J type Straight type — Internal Coolant Supply



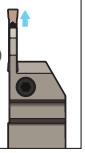
Shank Size (H x W)
20 × 20mm
25 × 25mm
F32

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

Grooving / Cut-off (Traverse Cutting)

GNDL type Straight type

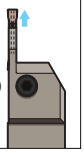


Shank Size (H x W)
20 × 20mm
25 × 25mm
32 × 25mm
32 × 32mm
F34

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

GNDL-J type Straight type — Internal Coolant Supply



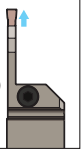
Shank Size (H x W)
20 × 20mm
25 × 25mm
F36

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

Grooving / Cut-off (Traverse Cutting)

GNDXL type Straight type — New



Shank Size (H x W)
20 × 20mm
25 × 25mm
F38

Available Edge Widths (mm)		
2.0	3.0	4.0
5.0	6.0	

Applicable Chipbreaker: ML GF RN

Inserts are dedicated products.

For External Machining Straight type series
(Groove Depth up to 25mm)

MG: Multi-functional / General-purpose type ML: Multi-functional / Low-feed type GG: Grooving / General-purpose type GL: Grooving / Low-feed type GF: Grooving / Low cutting force type CG: Cut-off / General-purpose type CF: Cut-off / Low cutting force type RG: Profiling / General-purpose type RN: Facing / Necking / General-purpose type GA: Non-Ferrous Metal / General-purpose type

Type	Shank Size (mm) Height (H)	Shank Size (mm) Width (B)	Width of Cut (mm)	Series	Max. Groove Depth (mm)	Ref. Page	MG	ML	GG	GL	GF	CG	CF	RG	RN	GA
Straight type			1.25 1.5	GNDM	10	F30					◎					
			1.25 1.5	GNDL	16	F34					◎					
			2	GNDS	6	F28		◎	◎	◎	◎	◎	◎		◎	◎
			2	GNDM	10	F30		◎	◎	◎	◎	◎	◎		◎	◎
			2	GNDM-J (Internal Coolant Supply)	10	F32		◎	◎	◎	◎	◎	◎		◎	◎
			2	GNDL	20	F34		○	◎	◎	◎	◎	◎		◎	◎
			2	GNDL-J (Internal Coolant Supply)	20	F36		○	◎	◎	◎	◎	◎		◎	◎
			3	GNDS	6	F28	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDM	12	F30	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDM-J (Internal Coolant Supply)	12	F32	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDL	20	F34	○	○	◎	◎	◎	◎	◎	◎	○	◎
	20	20	3	GNDL-J (Internal Coolant Supply)	20	F36	○	○	◎	◎	◎	◎	◎	◎	○	◎
	25	25	4	GNDS	10	F28	◎	◎	◎	◎	◎	◎		◎	○	◎
			4	GNDM	18	F30	◎	◎	◎	◎	◎	◎		◎	○	◎
			4	GNDM-J (Internal Coolant Supply)	18	F32	◎	◎	◎	◎	◎	◎		◎	○	◎
			4	GNDL	25	F34	○	○	◎	◎	◎	◎		◎	○	◎
			4	GNDL-J (Internal Coolant Supply)	25	F36	○	○	◎	◎	◎	◎		◎	○	◎
			5 6	GNDS	10	F28	◎	◎	◎	◎	◎			◎	○	◎
			5 6	GNDM	18	F30	◎	◎	◎	◎	◎			◎	○	◎
			5 6	GNDM-J (Internal Coolant Supply)	18	F32	◎	◎	◎	◎	◎			◎	○	◎
			5 6	GNDL	25	F34	○	○	◎	◎	◎			◎	○	◎
			5 6	GNDL-J (Internal Coolant Supply)	25	F36	○	○	◎	◎	◎			◎	○	◎
			7 8	GNDM	18	F30	◎	◎	◎	◎	◎			◎		
			7 8	GNDL	25	F34	○	○	◎	◎	◎			◎		
			3	GNDM	12	F30	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
			3	GNDL	20	F34	○	○	◎	◎	◎	◎	◎	◎	○	◎
			4	GNDM	18	F30	◎	◎	◎	◎	◎	◎		◎	○	◎
	32	25*	4	GNDL	25	F34	○	○	◎	◎	◎	◎		◎	○	◎
	32	32	5 6	GNDM	18	F30	◎	◎	◎	◎	◎			◎	○	◎
			5 6	GNDL	25	F34	○	○	◎	◎	◎			◎	○	◎
			7 8	GNDM	18	F30	◎	◎	◎	◎	◎			◎		
			7 8	GNDL	25	F34	○	○	◎	◎	◎			◎		

■: In stock *: Made-to-order item (Shank size (height x width) 32 x 25mm)

◎: Best ○: Suitable

For External Machining Straight Edge type series
(Groove Depth up to 32mm)

ML: Multi-functional / Low-feed type GF: Grooving / Low cutting force type RN: Facing / Necking / General-purpose type

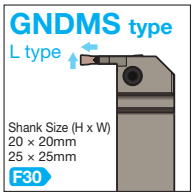
Type	Shank Size (mm) Height (H)	Shank Size (mm) Width (B)	Cutting Edge Width (mm)	Model	Max. Groove Depth (mm)	Ref. Page	Applicable Chipbreakers (GNDXL type Dedicated) ML	GF	RN
Straight Edge type	20	20	2	GNDXL	26	F38	○	◎	○
	25	25	3 4 5 6		32	F38	○	◎	○

■: In Stock ■: Made-to-order item Note: Only dedicated 1-cornered inserts (insert part number suffix [1]) can be used for GNDXL type. ◎: Best ○: Suitable Red text: Expanded item

GND series

For External Machining (L type)

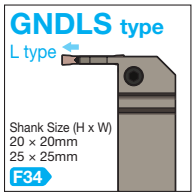
Traverse Cutting / Profiling (Cut-off)



Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

Grooving / Cut-off (Traverse Cutting)



Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

For External Machining L type series

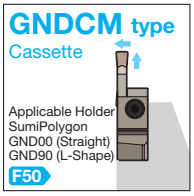
MG : Multi-functional / General-purpose type　ML : Multi-functional / Low-feed type　GG : Grooving / General-purpose type　GL : Grooving / Low-feed type　GF : Grooving / Low cutting force type
CG : Cut-off / General-purpose type　CF : Cut-off / Low cutting force type　RG : Profiling / General-purpose type　RN : Facing / Necking / General-purpose type　GA : Non-Ferrous Metal / General-purpose type

Type	Shank Size (mm) Height (H)	Shank Size (mm) Width (B)	Width of Cut (mm) 1.25	1.5	2	3	4	5	6	7	8	Series	Max. Groove Depth (mm) 5 10 15 20 25 30	Ref. Page	MG	ML	GG	GL	GF	CG	CF	RG	RN	GA
L type	20	20			2							GNDLS	16	F34		○	◎	◎	◎	◎	◎		◎	◎
						3						GNDMS	10	F30	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
						3						GNDLS	16	F34	○	○	◎	◎	◎	◎	◎	◎	○	◎
							4					GNDMS	12	F30	◎	◎	◎	◎	◎	◎		◎	○	◎
								5				GNDMS	12	F30	◎	◎	◎	◎	◎			◎	○	◎
	25	25			2							GNDLS	18	F34		○	◎	◎	◎	◎	◎		◎	◎
						3						GNDMS	12	F30	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
						3						GNDLS	18	F34	○	○	◎	◎	◎	◎	◎	◎	○	◎
							4					GNDMS	14	F30	◎	◎	◎	◎	◎	◎		◎	○	◎
							4					GNDLS	23	F34	○	○	◎	◎	◎	◎		◎	○	◎
								5	6			GNDMS	14	F30	◎	◎	◎	◎	◎			◎	○	◎
								5	6			GNDLS	23	F34	○	○	◎	◎	◎			◎	○	◎

■ : In Stock　　◎: Best　○: Suitable

For External Machining (SumiPolygon Cassette)

Grooving / Cut-off / Traverse Cutting / Profiling



Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

SumiPolygon Cassette series

MG : Multi-functional / General-purpose type　ML : Multi-functional / Low-feed type　GG : Grooving / General-purpose type　GL : Grooving / Low-feed type　GF : Grooving / Low cutting force type
CG : Cut-off / General-purpose type　CF : Cut-off / Low cutting force type　RG : Profiling / General-purpose type　RN : Facing / Necking / General-purpose type　GA : Non-Ferrous Metal / General-purpose type

Type	Applicable SumiPolygon Holders	Width of Cut (mm) 1.25	1.5	2	3	4	5	6	7	8	Series	Max. Groove Depth (mm) 5 10 15 20 25 30	Ref. Page	MG	ML	GG	GL	GF	CG	CF	RG	RN	GA
Cassette	GND00			2							GNDCM	12	F50		◎	◎	◎	◎	◎	◎		◎	○	◎
					3							12	F50	◎	◎	◎	◎	◎	◎	◎	◎	○	◎
	GND90					4						18	F50	◎	◎	◎	◎	◎	◎		◎	○	◎
							5	6				18	F50	◎	◎	◎	◎	◎			◎	○	◎

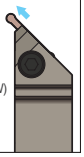
■ : In Stock　　◎: Best　○: Suitable

GND series

For Necking

Necking

GNDN type Straight type



Shank Size (H x W)
20 × 20mm
25 × 25mm
F40

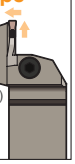
Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

For Facing

Grooving / Traverse Cutting / Profiling

GNDF type Straight type

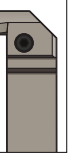


Shank Size (H x W)
20mm × 20mm
25mm × 25mm
F42

Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

GNDFS type L type



Shank Size (H x W)
25mm × 25mm
32mm × 32mm
F44

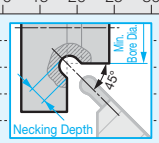
Available Edge Widths (mm)		
1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

Necking series

MG: Multi-functional / General-purpose type ML: Multi-functional / Low-feed type GG: Grooving / General-purpose type GL: Grooving / Low-feed type GF: Grooving / Low cutting force type
CG: Cut-off / General-purpose type CF: Cut-off / Low cutting force type RG: Profiling / General-purpose type RN: Facing / Necking / General-purpose type GA: Non-Ferrous Metal / General-purpose type

Type	Shank Size (mm) Height H	Shank Size (mm) Width B	Width of Cut (mm)	Series	Max. Groove Depth (mm)	Min. Bore Dia. (mm)	Ref. Page	MG	ML	GG	GL	GF	CG	CF	RG	RN	GA
Straight type	20	20	2	GNDN	1.5	ø20	F40									◎	
			3		2.0	ø20	F40									◎	
	25	25	4		3.0	ø30	F40									◎	
			5		3.5	ø30	F40									◎	
			6		4.0	ø30	F40									◎	



: In Stock ◎: Best

For Facing Straight / L type series

MG: Multi-functional / General-purpose type ML: Multi-functional / Low-feed type GG: Grooving / General-purpose type GL: Grooving / Low-feed type GF: Grooving / Low cutting force type
CG: Cut-off / General-purpose type CF: Cut-off / Low cutting force type RG: Profiling / General-purpose type RN: Facing / Necking / General-purpose type GA: Non-Ferrous Metal / General-purpose type

Type	Shank Size (mm) Height H	Shank Size (mm) Width B	Width of Cut (mm)	Series	Max. Groove Depth (mm)	Machining diameter (mm)	Ref. Page	MG	ML	GG	GL	GF	CG	CF	RG	RN	GA
Straight type	20	20	3	GNDF	12	ø35 ø45	F42	◎	◎	◎	◎	◎				◎	◎
			3		12	ø40 ø55	F42	◎	◎	◎	◎	◎				◎	◎
			3		18	ø50 ø70	F42	◎	◎	◎	◎	◎				◎	◎
			3		18	ø65 ø100	F42	◎	◎	◎	◎	◎				◎	◎
			3		18	ø90 ø150	F42	◎	◎	◎	◎	◎				◎	◎
			3		18	ø140 ø200	F42	◎	◎	◎	◎	◎				◎	◎
			3		18	ø180 ø300	F42	◎	◎	◎	◎	◎				◎	◎
			4	GNDF	18	ø40 ø55	F42	◎	◎	◎	◎	◎				◎	◎
			4		23	ø50 ø70	F42	◎	◎	◎	◎	◎				◎	◎
			4		23	ø65 ø90	F42	◎	◎	◎	◎	◎				◎	◎
			4		23	ø85 ø130	F42	◎	◎	◎	◎	◎				◎	◎
			4		23	ø125 ø200	F42	◎	◎	◎	◎	◎				◎	◎
			4		23	ø180 ø300	F42	◎	◎	◎	◎	◎				◎	◎
			4		23	ø280 ø1,000	F42	◎	◎	◎	◎	◎				◎	◎
			5	GNDF	23	ø50 ø70	F42	◎	◎	◎	◎	◎				◎	◎
			5		23	ø65 ø90	F42	◎	◎	◎	◎	◎				◎	◎
			5		23	ø85 ø130	F42	◎	◎	◎	◎	◎				◎	◎
			5		23	ø125 ø200	F42	◎	◎	◎	◎	◎				◎	◎
			5		23	ø180 ø300	F42	◎	◎	◎	◎	◎				◎	◎
			5		23	ø280 ø1,000	F42	◎	◎	◎	◎	◎				◎	◎
			6	GNDF	23	ø50 ø75	F42	◎	◎	◎	◎	◎				◎	◎
			6		23	ø70 ø110	F42	◎	◎	◎	◎	◎				◎	◎
			6		23	ø100 ø200	F42	◎	◎	◎	◎	◎				◎	◎
			6		23	ø180 ø300	F42	◎	◎	◎	◎	◎				◎	◎
			6		23	ø280 ø1,000	F42	◎	◎	◎	◎	◎				◎	◎
L type	25	25	6	GNDFS	20	ø70 ø100	F44	◎	◎	◎	◎	◎				◎	◎
			6		20	ø100 ø200	F44	◎	◎	◎	◎	◎				◎	◎
			6		20	ø180 ø300	F44	◎	◎	◎	◎	◎				◎	◎
			6		20	ø280 ø1,000	F44	◎	◎	◎	◎	◎				◎	◎
			6		20	ø450~	F44	◎	◎	◎	◎	◎				◎	◎
	32	32	8	GNDFS	20	ø70 ø100	F44	◎	◎	◎	◎	◎					
			8		20	ø100 ø200	F44	◎	◎	◎	◎	◎					
			8		20	ø180 ø300	F44	◎	◎	◎	◎	◎					
			8		20	ø280 ø1,000	F44	◎	◎	◎	◎	◎					
			8		20	ø450~	F44	◎	◎	◎	◎	◎					

: In Stock : Made-to-order item ◎: Best

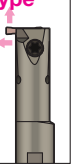
GND series

For Internal Machining (Work Dia.: ø14mm~)

Grooving / Traverse Cutting / Profiling

GNDIS type
Straight type

Shank Dia.
ø12mm
ø16mm
ø20mm
F46



Available Edge Widths (mm)

1.5	2.0	3.0

Applicable Chipbreaker: ML | GF

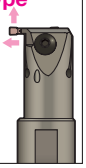
Inserts are dedicated products.

For Internal Machining (Work Dia.: ø32mm~)

Grooving / Traverse Cutting / Profiling

GNDI type
Straight type

Shank Dia.
ø25mm
ø32mm
ø40mm
F48



Available Edge Widths (mm)

1.25	1.5	2.0
3.0	4.0	5.0
6.0	7.0	8.0

Applicable Chipbreaker: MG ML GG GL GF CG CF RG RN GA

Series for Internal Machining
(Machining Dia. ø14mm ~)

ML : Multi-functional / Low-feed type GF : Grooving / Low cutting force type

Type	Shank Size DCON (mm)	Width of Cut (mm) 1.5	2	3	Series	Max. Groove Depth (mm) 5 10 15 20 25 30	Min. Bore Dia. (mm)	Ref. Page	Applicable Chipbreakers (Dedicated for GNDIS type) ML	GF
Straight type	ø12	1.5			GNDIS	2.6	ø14	F46		◎
		1.5				3.6	ø14	F46		◎
			2	3		2.6	ø14	F46	◎	◎
			2	3		3.6	ø14	F46	◎	◎
	ø16	1.5			GNDIS	3.6	ø16	F46		◎
		1.5				4.6	ø20	F46		◎
			2	3		3.6	ø16	F46	◎	◎
			2	3		4.6	ø20	F46	◎	◎
	ø20	1.5			GNDIS	6.6	ø25	F46		◎
			2	3		6.6	ø25	F46	◎	◎

: In Stock

Note: Only dedicated GXM inserts can be used for GNDIS types.

◎: Best

Series for Internal Machining
(Machining Dia. ø32mm ~)

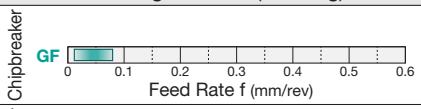
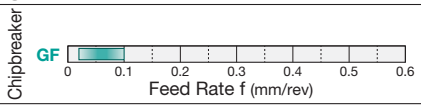
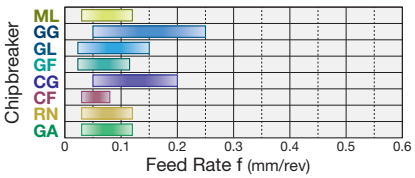
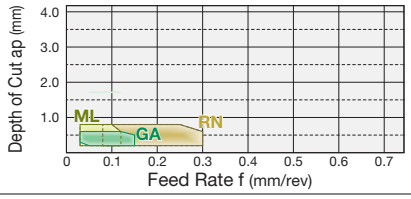
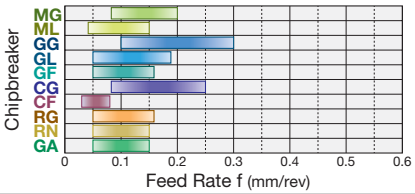
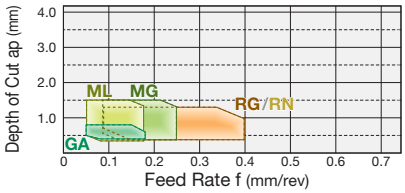
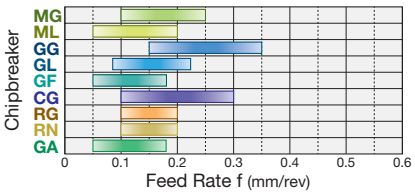
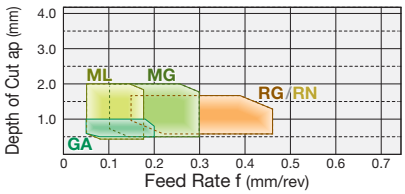
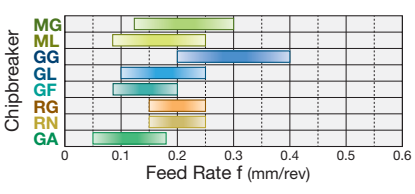
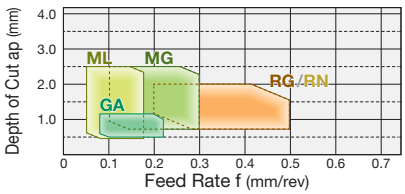
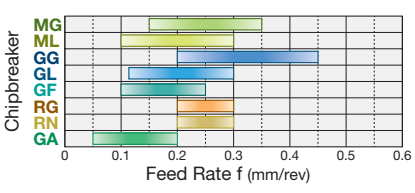
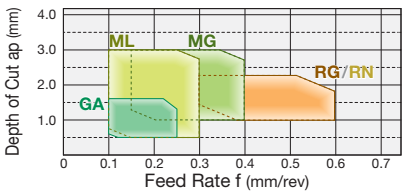
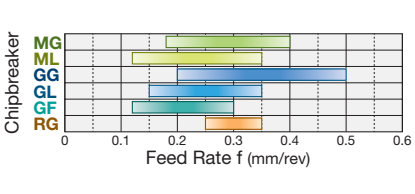
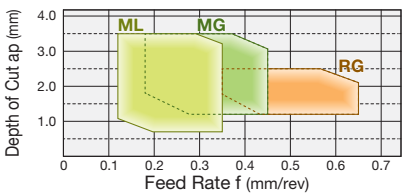
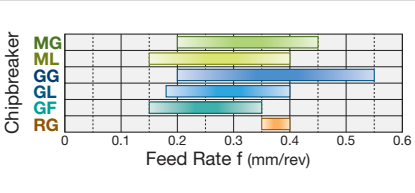
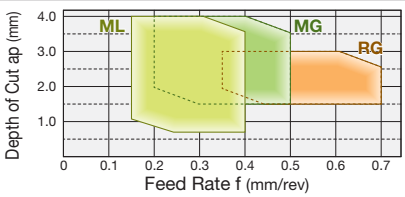
MG : Multi-functional / General-purpose type ML : Multi-functional / Low-feed type GG : Grooving / General-purpose type GL : Grooving / Low-feed type GF : Grooving / Low cutting force type
CG : Cut-off / General-purpose type CF : Cut-off / Low cutting force type RG : Profiling / General-purpose type RN : Facing / Necking / General-purpose type GA : Non-Ferrous Metal / General-purpose type

Type	Shank Size DCON (mm)	Width of Cut (mm) 2	3	4	5	6	Series	Max. Groove Depth (mm) 5 10 15 20 25 30	Min. Bore Dia. (mm)	Ref. Page	Applicable Chipbreakers MG	ML	GG	GL	GF	CG	CF	RG	RN	GA
Straight type	ø25	2					GNDI	6	ø32	F48		◎	○	◎	◎				◎	◎
			3	4	5			6	ø32	F48	○	◎	○	◎	◎				◎	◎
	ø32	2					GNDI	6	ø32	F48		◎	○	◎	◎				◎	◎
			3	4	5			10	ø40	F48	○	◎	○	◎	◎				◎	◎
	ø40		3	4	5	6	GNDI	11	ø50	F48	○	◎	○	◎	◎				◎	◎

: In Stock

◎: Best ○: Suitable

GND series Recommended Cutting Conditions

Width of Cut (mm)	Recommended Cutting Conditions: Grooving / Cut-off (Necking)	Recommended Cutting Conditions: Traverse Cutting	Corner Radius (mm)	Applicable Insert
1.25		—	0.05	MG ML GG GL **GF** CG CF RG RN GA
1.5		—	0.05	MG ML GG GL **GF** CG CF RG RN GA
2.0			0.03	MG ML GG GL GF CG **CF** RG RN GA
			0.2	MG **ML** **GG** **GL** **GF** **CG** CF RG RN **GA**
			0.4	MG ML GG **GL** **GF** CG CF RG RN GA
			1.0	MG ML GG GL GF CG CF RG **RN** GA
3.0			0.03	MG ML GG GL GF CG **CF** RG RN GA
			0.2	**MG** **ML** **GG** **GL** **GF** **CG** CF RG RN **GA**
			0.4	**MG** **ML** **GG** **GL** **GF** CG CF RG RN GA
			1.5	MG ML GG GL GF CG CF **RG** **RN** GA
4.0			0.2	MG ML GG GL GF **CG** CF RG RN GA
			0.4	**MG** **ML** **GG** **GL** **GF** CG CF RG RN **GA**
			0.8	**MG** **ML** GG GL GF CG CF RG RN GA
			2.0	MG ML GG GL GF CG CF **RG** **RN** GA
5.0			0.2	MG ML **GG** **GL** **GF** CG CF RG RN GA
			0.4	**MG** **ML** **GG** **GL** **GF** CG CF RG RN **GA**
			0.8	**MG** **ML** GG GL GF CG CF RG RN GA
			2.5	MG ML GG GL GF CG CF **RG** **RN** GA
6.0			0.2	MG ML **GG** **GL** **GF** CG CF RG RN GA
			0.4	**MG** **ML** **GG** **GL** **GF** CG CF RG RN **GA**
			0.8	**MG** **ML** GG GL GF CG CF RG RN GA
			3.0	MG ML GG GL GF CG CF **RG** **RN** GA
7.0			0.2	MG ML GG GL **GF** CG CF RG RN GA
			0.4	**MG** **ML** **GG** **GL** **GF** CG CF RG RN GA
			0.8	**MG** **ML** GG GL GF CG CF RG RN GA
			3.5	MG ML GG GL GF CG CF **RG** RN GA
8.0			0.2	MG ML GG GL **GF** CG CF RG RN GA
			0.4	**MG** **ML** **GG** **GL** **GF** CG CF RG RN GA
			0.8	**MG** **ML** GG GL GF CG CF RG RN GA
			4.0	MG ML GG GL GF CG CF **RG** RN GA

For face grooving, use cutting conditions closer to the lower limit of the recommended cutting conditions to ensure that chips are long.
In cut-off applications, reduce the feed rate to around 30% to 50% near the centre of the workpiece.
As there is less space for chip evacuation when machining internal diameters (particularly small bore diameters), ML/GL/GF type chipbreakers are recommended.
Modifications to inserts and holders are required to perform turning such as radius grooving when using the RG type chipbreaker with the GNDF type holder for facing.
Use GNDXL type holders at feed rate 80% or below.

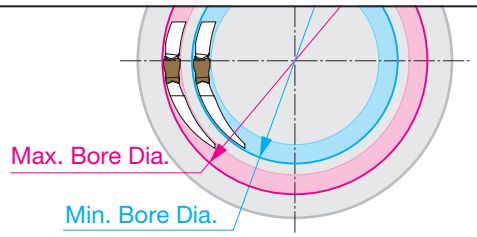
■ Recommended Cutting Conditions

Recommended Cutting Conditions for GNDIS type ☞ F47

Work Material	P Carbon Steel / Alloy Steel					M Stainless Steel			K Cast Iron				S Exotic Alloy		N Non-Ferrous Metals
Insert Grade	AC8025P	AC8035P AC830P	AC5015S AC520U	AC5025S AC530U AC1030U	T2500A	AC8035P AC830P	AC5015S AC520U	AC5025S AC530U AC1030U	AC8025P	AC425K	AC5015S AC520U	AC5025S AC530U AC1030U	AC5015S AC520U	AC5025S AC530U AC1030U	H10
Cutting Speed vc (m/min)	80 to 250	80 to 200	80 to 200	50 to 200	50 to 200	70 to 150	70 to 150	50 to 150	80 to 200	80 to 200	60 to 200	50 to 200	20 to 80	20 to 60	150 to 300

Key Points for Facing

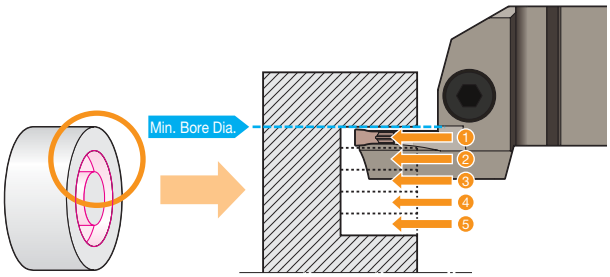
Holder Selection



- Select a holder with which the outer diameter of the first groove to be machined is between the maximum and minimum grooving diameters of the holder.
- If the turning start point is within the effective work diameter range, the work diameter will not be limited for subsequent passes.
- Select the lower limit of the recommended cutting conditions for the chipbreaker and ensure long chips for evacuation purposes. (In face grooving, broken chips easily get stuck in grooves, which causes problems.)
- When breaking chips, step feed is required.

Precautions for Groove Expansion

Recommended Chipbreakers MG ML GG GL GF GA



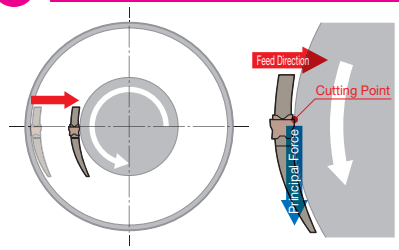
- If the first groove is within the effective work diameter range during groove expansion via plunging, the work diameter will not be limited for subsequent passes.

Precautions for Traverse Cutting

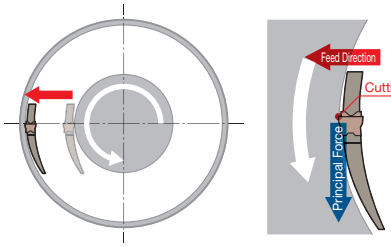
Recommended Chipbreakers MG ML RN

Considering the rigidity of the holder, we recommend turning from the outside to the inside.

○ External → Internal



× Internal → External



If turning is performed from the inner to the outer diameter, the wall thickness remaining on the principal force side will become thinner, reducing the rigidity of the holder.

- If the turning start point for traverse face cutting operation is within the effective work diameter range, the work diameter will not be limited for traverse cutting.

Key Points in Internal Machining

Precautions for Internal Machining

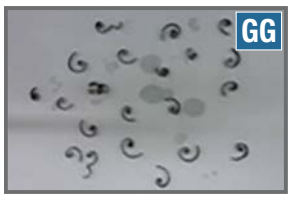
Recommended Chipbreakers ML GL GF

If the prepared hole diameter is small, use an ML type or GL type low-feed chipbreaker, both of which reduce chip curl diameter, to ensure adequate chip evacuation.

Work Material: SCM415 Prepared Hole Diameter: ø25mm Holder: GNDI R2532-T306 Insert: GCM N300○-○○
Cutting Conditions: vc = 100m/min, f = 0.1mm/rev, ap = 3.0mm Wet

Internal Machining

External Machining



GCMN3002-GG

⚠ Chip shapes differ between internal machining and external machining even under the same cutting conditions.

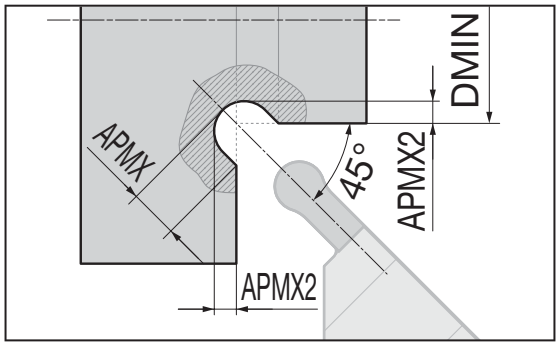
Work Material: SCM415
Holder: GNDL R2525M-320, Insert: GCM N3002-GG
Cutting Conditions: vc = 100m/min, f = 0.10mm/rev, ap = 5.0mm Wet

Key Points for Necking

Precautions for Necking

Recommended Chipbreaker RN

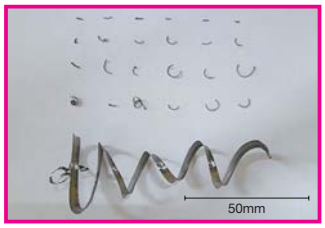
Distance from Work Material to Necking Depth

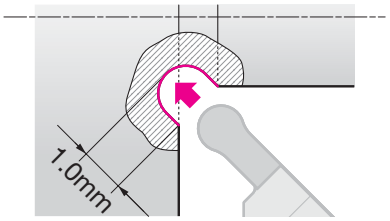


Width of Cut CW (mm)	Necking Depth APMX (mm)	Distance from Work Material to Necking Depth APMX2 (mm)
2.0	1.5	0.64
3.0	2.0	0.79
4.0	3.0	1.29
5.0	3.5	1.44
6.0	4.0	1.59

· For necking, these conditions are recommended for each width of cut when grooving with RN type chipbreakers.
· To prevent interference with the work material, the work diameter for each GNDN type holder should be set to the minimum bore diameter (DMIN) or less.

Chip Shape

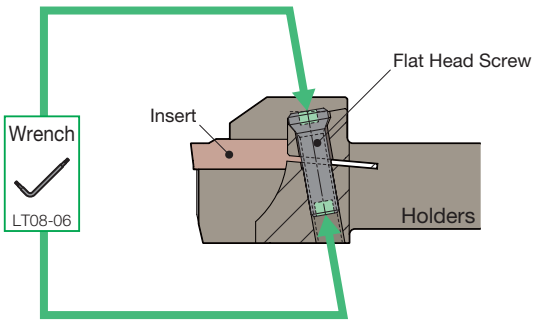




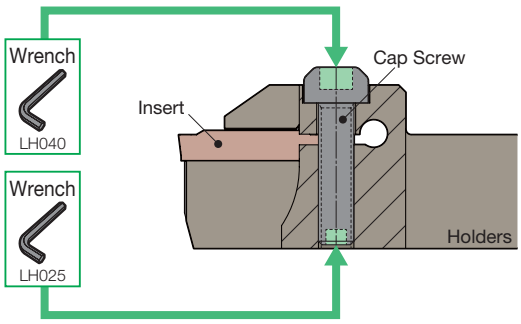
Work Material : SCM435 Groove Width: 3.0mm
Holder : GNDN R2020K-320-020
Insert : GCMN3015-RN
Cutting Conditions : vc = 100m/min, f = 0.1mm/rev
Necking Depth = 1.0mm Wet

Key Points in Internal Coolant Supply Holders For Small Lathes

· 12mm and 16mm square Internal Coolant Supply Holders for Small Lathes enable insert exchange from both top and bottom.



12mm square holder: **GNDL R/L1212JX-○○○.○J**



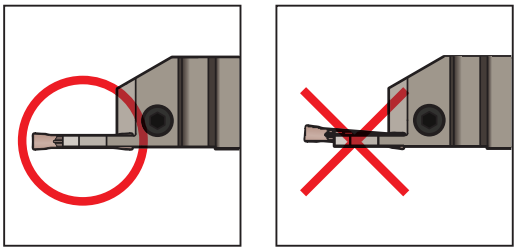
16mm square holder: **GNDM R/L1616JX-○○○J**
GNDL R/L1616JX-○○○J

Precautions for SEC-Grooving Tool Holders GND series

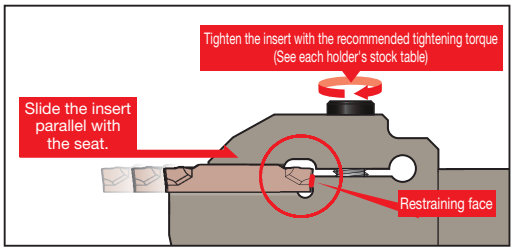
■ Insert Mounting Precautions

(1) Remove any dust, etc. from the insert seat, bolt, and bolt hole before attaching the insert.
(2) If there are scratches or burrs on the insert seat, scrape them away.
(3) Mount the insert by sliding it parallel to the seat.
(4) Clamp the insert with the opposite side (holder side) of the cutting edge secured on the constraining surface.
(5) Tighten the insert with the recommended tightening torque. If the insert is tightened with excessive torque, it may be damaged, leading to injury.
(6) When exchanging the insert, adjust the cutting edge offset value.

Mount the insert parallel to the seat



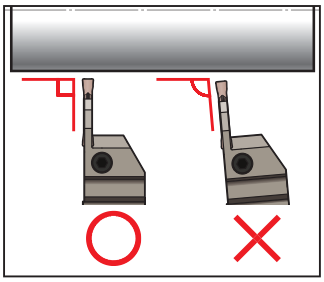
Be sure to push the insert to the end



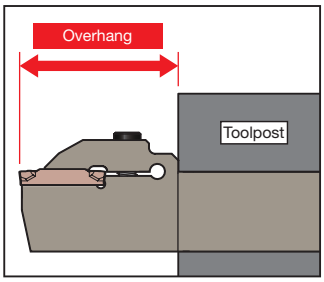
■ Precautions when Mounting Holders

(1) Remove any dust and oil from the toolpost before setting the holder.
(2) If there are scratches or burrs on the toolpost, scrape them away.
(3) Place the holder so that the insert is perpendicular to the workpiece. Failure to do so may bend the machined surface or cause chattering.
(4) The overhang of the holder should be as short as possible.
(5) When grooving or traverse cutting, adjust the centre height of the cutting edge to as close to ±0mm as possible. (Within ±0.1mm is recommended.) Incorrect centre height adjustment may cause chattering. In cut-off applications, adjust the centre height of the cutting edge to a value from 0 to +0.2mm. A lower centre height will result in a larger pip at the centre.
(6) Set the oil supply nozzle so that coolant can be supplied from the top of the upper clamp unit.

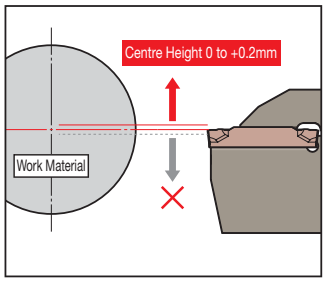
Mount the holder perpendicular to the workpiece.



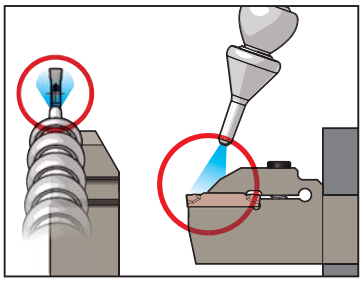
The overhang should be short.



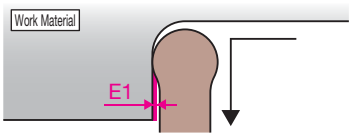
Centre height adjustment in cut-off applications

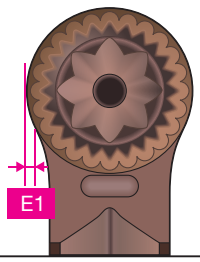


Supply coolant to the top of the upper clamp unit



■ Depth of Cut when Pulling Out with RG/RN type Chipbreakers



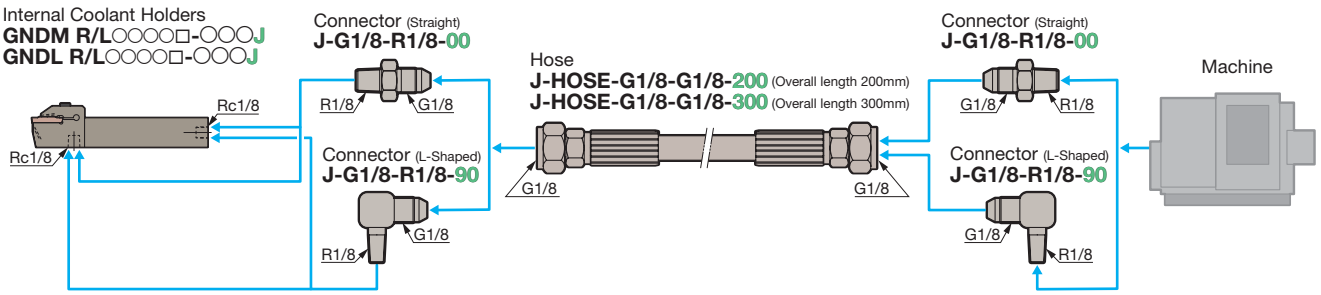


Width of Cut (mm)	Maximum Depth of Cut when Pulling Out (mm)
CW	E1
2.0*	**0.10**
3.0	**0.15**
4.0	**0.20**
5.0	**0.25**
6.0	**0.30**
7.0	**0.35**
8.0	**0.40**

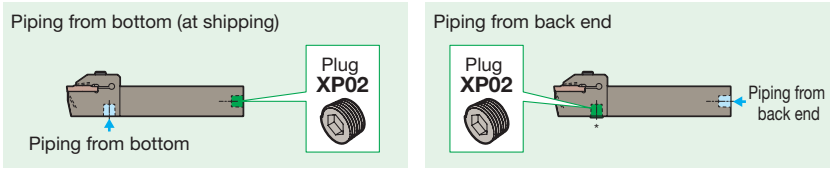
*: CW = 2.0 is RN type chipbreakers only

Precautions for SEC-Grooving Tool Holders GND series

■ Piping Method for Hoses and Connectors

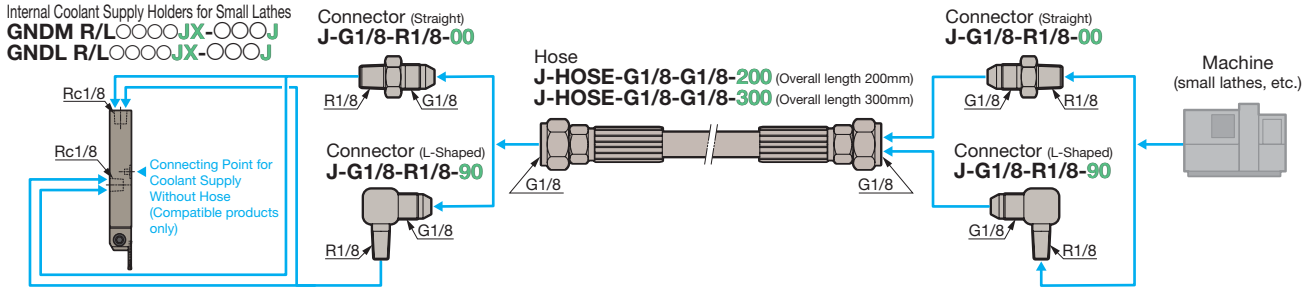


· Apply sealant such as commercial sealing tape to the piping connection parts.
· For plug mounting when piping, see the figure below.

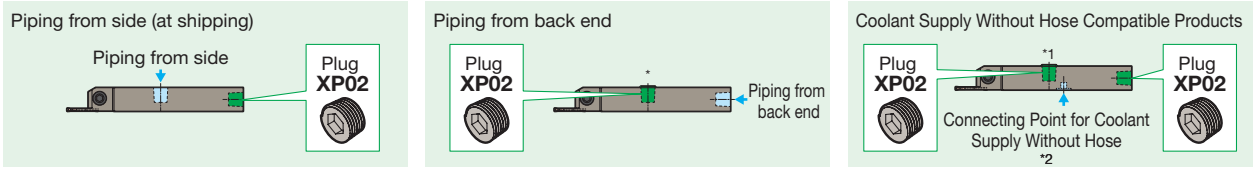


* The plug will protrude a few millimetres when mounted on the bottom.

■ Piping Method for Hoses and Connectors (For Small Lathes)



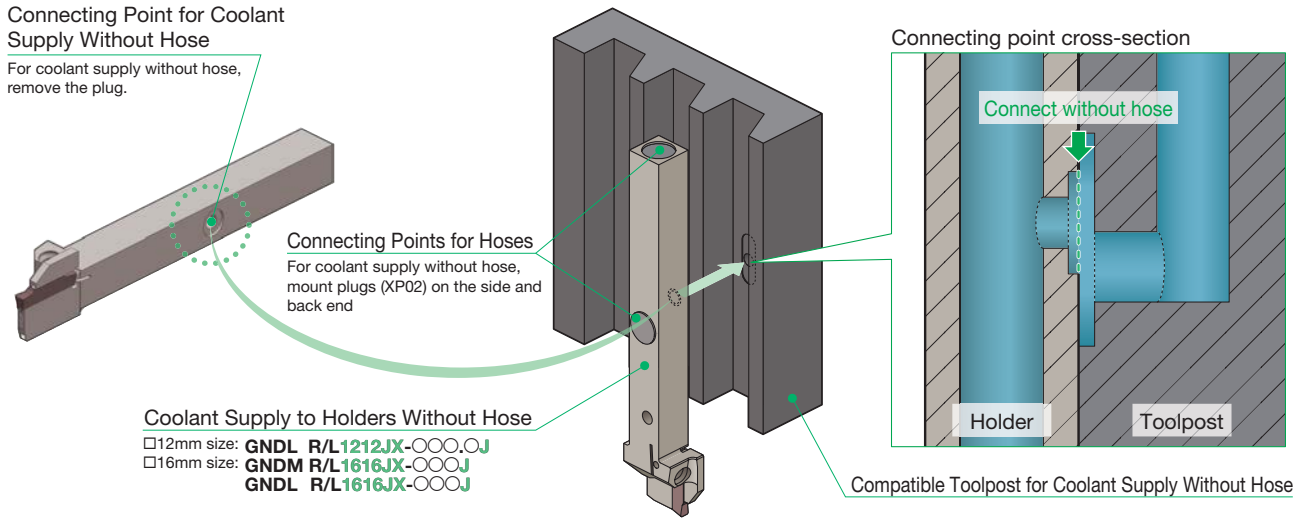
· Apply sealant such as commercial sealing tape to the piping connection parts.
· For plug mounting when piping, see the figure below.



* The plug will protrude a few millimetres when mounted on the side.

*1: The plug will protrude a few millimetres when mounted on the side.
*2: The plug is mounted at shipping, so remove it for use with coolant supply without hose.

Coolant Supply to Holders Without Hose Coolant can be supplied directly from the toolpost without a hose



GNDM type / GNDL type

External | Zero Offset

*For traverse cutting (groove expansion), use a multi-functional or profiling insert.

For Small Lathes, External Multi-Functional (Grooving, Traverse Cutting and Profiling) Clamp-on

GNDM

External Grooving (for Small Lathes)

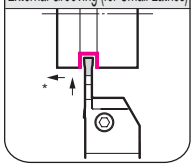


Fig 1

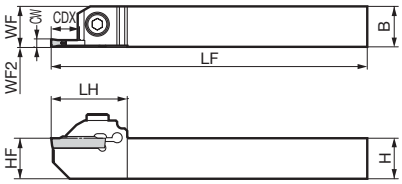


Fig 2

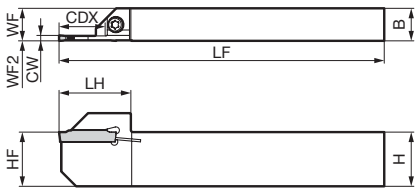


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Offset WF2	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw BX0515 / BFTX0414	N·m	Wrench LT15-10 / LH040
GNDM R/L1616JX-1.2508	●	●	16	16	120	(16)	16	26	0	**1.25**	**8.0**	GCM N125005-GF	1			
GNDM R/L1616JX-1.510	●	●	16	16	120	(16)	16	26	0	**1.50**	**10.0**	GCM N150005-GF	1			
GNDM R/L1616JX-212	●	●	16	16	120	(16)	16	30	0	**2.00**	**12.0**	GC□ □20○○-□□	1	BX0515	**4.0**	LH040
GNDM R/L1616JX-312	●	●	16	16	120	(16)	16	30	0	**3.00**	**12.0**	GC□ □30○○-□□	1			
GNDM R/L2012JX-217	●	●	20	12	120	(12)	20	26.5	0	**2.00**	**17.0**	GC□ □20○○-□□	2			
GNDM R/L2012JX-317	●	●	20	12	120	(12)	20	26.5	0	**3.00**	**17.0**	GC□ □30○○-□□	2	BFTX0414	**3.0**	LT15-10

Select holders and inserts with matching width of cut (CW). Refer to F25 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

External | Zero Offset

For Small Lathes, External Grooving & Cut-off Clamp-on

GNDL

External Grooving (for Small Lathes)

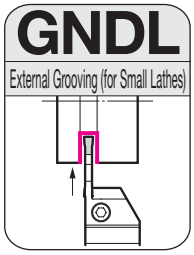


Fig 1

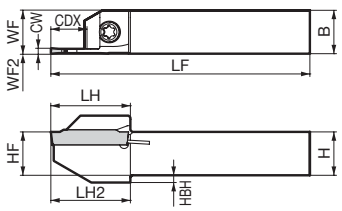


Fig 2

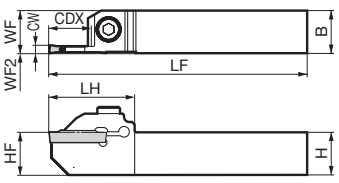


Fig 3

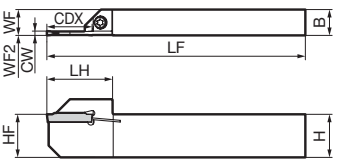


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Step HBH	Head LH	Head LH2	Offset WF2	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Flat Head Screw / Cap Screw BFTX0412N / BFTX0414 / BX0515	N·m	Wrench LT15-10 / LH040
GNDL R/L1010JX-1.2510	●	●	10	10	120	(10)	10	2.0	18	18.3	0	**1.25**	**10.0**	GCM N125005-GF	1			
GNDL R/L1010JX-1.510	●	●	10	10	120	(10)	10	2.0	18	18.3	0	**1.50**	**10.0**	GCM N150005-GF	1			
GNDL R/L1010JX-210	●	●	10	10	120	(10)	10	2.0	22	22.3	0	**2.00**	**10.0**	GC□ □20○○-□□	1	BFTX0412N	**3.0**	LT15-10
GNDL R/L1010JX-310	●	●	10	10	120	(10)	10	2.0	22	22.3	0	**3.00**	**10.0**	GC□ □30○○-□□	1			
GNDL R/L1212JX-1.2512	●	●	12	12	120	(12)	12	2.0	19	19.3	0	**1.25**	**12.0**	GCM N125005-GF	1			
GNDL R/L1212JX-1.512	●	●	12	12	120	(12)	12	2.0	19	19.3	0	**1.50**	**12.0**	GCM N150005-GF	1			
GNDL R/L1212JX-212.5	●	●	12	12	120	(12)	12	2.0	22	22.3	0	**2.00**	**12.5**	GC□ □20○○-□□	1	BFTX0412N	**3.0**	LT15-10
GNDL R/L1212JX-312.5	●	●	12	12	120	(12)	12	2.0	22	22.3	0	**3.00**	**12.5**	GC□ □30○○-□□	1			
GNDL R/L1616JX-1.2512.5	●	●	16	16	120	(16)	16	—	28	—	0	**1.25**	**12.5**	GCM N125005-GF	2			
GNDL R/L1616JX-1.512.5	●	●	16	16	120	(16)	16	—	28	—	0	**1.50**	**12.5**	GCM N150005-GF	2			
GNDL R/L1616JX-216	●	●	16	16	120	(16)	16	—	32	—	0	**2.00**	**16.0**	GC□ □20○○-□□	2	BX0515	**4.0**	LH040
GNDL R/L1616JX-316	●	●	16	16	120	(16)	16	—	32	—	0	**3.00**	**16.0**	GC□ □30○○-□□	2			
GNDL R/L2012JX-221	●	●	20	12	120	(12)	20	—	30.5	—	0	**2.00**	**21.0**	GC□ □20○○-□□	3			
GNDL R/L2012JX-321	●	●	20	12	120	(12)	20	—	30.5	—	0	**3.00**	**21.0**	GC□ □30○○-□□	3	BFTX0414	**3.0**	LT15-10

Select holders and inserts with matching width of cut (CW). Refer to F25 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

N·m Recommended Tightening Torque (N·m)

GNDM type / GNDL type

Inserts for GNDM type (For Small Lathes)/GNDL type (For Small Lathes) (Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

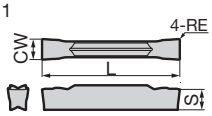


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3

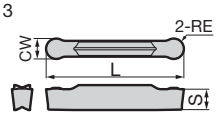
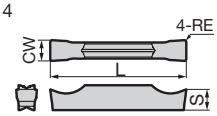


Fig 4



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2	5	1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

External Profiling / External Radius Grooving

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3015-RG	●	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	21.1	3.8	5	3

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●	2.0	±0.03	1.0	21.7	3.6	5	3
N3015-RN	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	22.6	3.8		3

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
		Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●	2.0	±0.025	0.2	21.1	3.6	5	4
N3002-GA	●	3.0	±0.025	0.2	21.1	3.8		4

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
External Profiling / External Radius Grooving	RG	Profiling / General-purpose
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

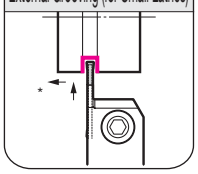
Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDM-J type / GNDL-J type

GNDM-J

External Grooving (for Small Lathes)



External
Zero Offset
Internal Coolant

Fig 1

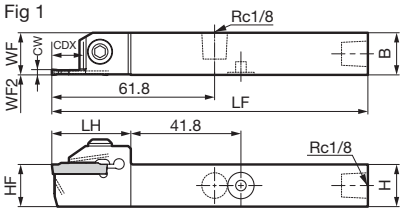


Fig 2

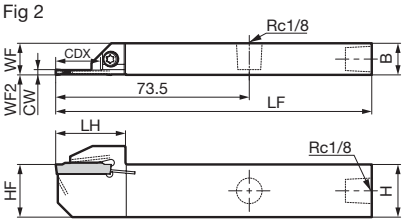
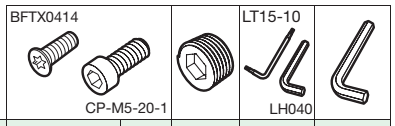


Figure shows right-handed (R) tool.

*For traverse cutting (groove expansion), use a multi-functional or profiling insert.

SumiSmall

■ Parts



■ Holder

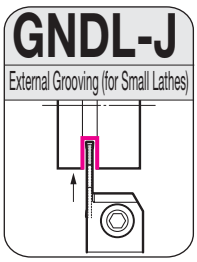
Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Offset WF2	Width of Cut CW	Maximum Groove Depth CDX	Max. Cut-off Dia.	Applicable Insert	Fig	Flat Head Screw / Cap Screw	N·m	Plug	Top Hex Wrench	Bottom Hex Wrench
GNDM R/L1616JX-212J	●	●	16	16	120	(16)	16	30.0	0	**2.0**	**12.0**	**24**	GC□ □20○○-□□	1	CP-M5-20-1	**5.0**	XP02	LH040	LH025
GNDM R/L1616JX-312J	●	●	16	16	120	(16)	16	30.0	0	**3.0**	**12.0**	**24**	GC□ □30○○-□□						
GNDM R/L2012JX-217J	●	●	20	12	120	(12)	20	26.5	0	**2.0**	**17.0**	**34**	GC□ □20○○-□□	2	BFTX0414	**3.0**	XP02	LT15-10	—
GNDM R/L2012JX-317J	●	●	20	12	120	(12)	20	26.5	0	**3.0**	**17.0**	**34**	GC□ □30○○-□□						

Select holders and inserts with matching width of cut (CW). Refer to F27 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

GNDL-J

External Grooving (for Small Lathes)



External
Zero Offset
Internal Coolant

Fig 1

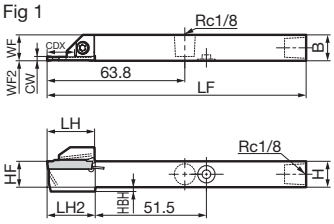


Fig 2

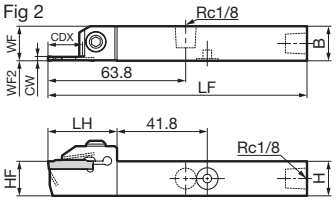


Fig 3

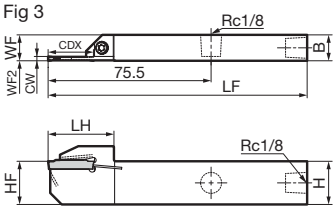
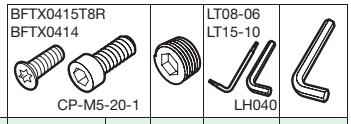


Figure shows right-handed (R) tool.

SumiSmall

■ Parts



■ Holder

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Step HBH	Head LH	Head LH2	Offset WF2	Width of Cut CW	Maximum Groove Depth CDX	Max. Cut-off Dia.	Applicable Insert	Fig	Flat Head Screw / Cap Screw	N·m	Plug	Top Hex Wrench	Bottom Hex Wrench
GNDL R/L1212JX-212.5J	●	●	12	12	120	(12)	12	2.0	22.0	22.3	0	**2.0**	**12.5**	**25**	GC□ □20○○-□□	1	BFTX0415T8R	**1.5**	XP02	LT08-06	←
GNDL R/L1212JX-312.5J	●	●	12	12	120	(12)	12	2.0	22.0	22.3	0	**3.0**	**12.5**	**25**	GC□ □30○○-□□						
GNDL R/L1616JX-216J	●	●	16	16	120	(16)	16	—	32.0	—	0	**2.0**	**16.0**	**32**	GC□ □20○○-□□	2	CP-M5-20-1	**5.0**	XP02	LH040	LH025
GNDL R/L1616JX-316J	●	●	16	16	120	(16)	16	—	32.0	—	0	**3.0**	**16.0**	**32**	GC□ □30○○-□□						
GNDL R/L2012JX-221J	●	●	20	12	120	(12)	20	—	30.5	—	0	**2.0**	**21.0**	**42**	GC□ □20○○-□□	3	BFTX0414	**3.0**	XP02	LT15-10	—
GNDL R/L2012JX-321J	●	●	20	12	120	(12)	20	—	30.5	—	0	**3.0**	**21.0**	**42**	GC□ □30○○-□□						

Select holders and inserts with matching width of cut (CW). Refer to F27 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

Fig 1

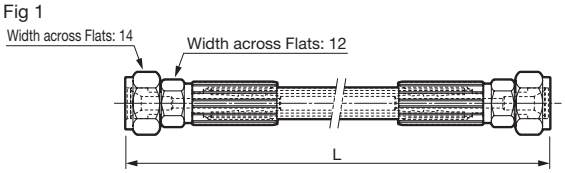


Fig 1

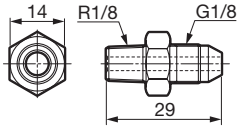
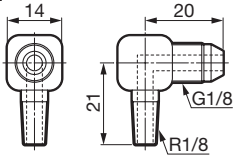


Fig 2



Parts (Hose)

Dimensions (mm)

Cat. No.	Stock	L	Screw Standard	Screw Standard	Fig
J-HOSE-G1/8-G1/8-200	●	200	G1/8	G1/8	1
J-HOSE-G1/8-G1/8-300	●	300	G1/8	G1/8	1

Hoses are sold separately.

Piping Method for Hoses and Connectors F23

Parts (Connector)

Dimensions (mm)

Cat. No.	Stock	Screw Standard	Screw Standard	Fig
J-G1/8-R1/8-00	●	G1/8	R1/8	1
J-G1/8-R1/8-90	●	G1/8	R1/8	2

Connectors are sold separately.

Piping Method for Hoses and Connectors F23

N·m Recommended Tightening Torque (N·m)

GNDM-J type / GNDL-J type

Inserts for GNDM-J type (For Small Lathes)/GNDL-J type (For Small Lathes)

(Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

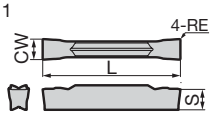


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3

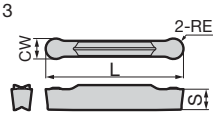
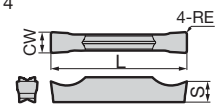


Fig 4



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6	5	1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6	5	1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

External Profiling / External Radius Grooving

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3015-RG	●	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	21.1	3.8	5	3

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●	2.0	±0.03	1.0	21.7	3.6	5	3
N3015-RN	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	22.6	3.8		3

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
		Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●	2.0	±0.025	0.2	21.1	3.6	5	4
N3002-GA	●	3.0	±0.025	0.2	21.1	3.8		4

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications	Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose	Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	ML	Multi-functional / Low-feed		CF	Cut-off / Low cutting force
Grooving / Cut-off	GG	Grooving / General-purpose	External Profiling / External Radius Grooving	RG	Profiling / General-purpose
	GL	Grooving / Low-feed	Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
	GF	Grooving / Low cutting force	Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDS type

External

*For traverse cutting (groove expansion), use a multi-functional or profiling insert.

External Multi-Functional, Shallow Grooves
(Grooving, Traverse Cutting and Profiling)
Clamp-on

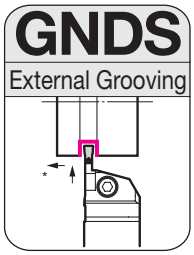


Fig 1

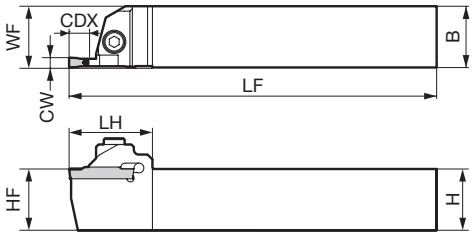


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw	Cap Screw N·m	Wrench
GNDS R/L2020K-206	●	●	20	20	125	20	20	30	**2.0**	**6**	GC□ □20○○-□□	1			
GNDS R/L2020K-306	●	●	20	20	125	20	20	30	**3.0**	**6**	GC□ □30○○-□□	1			
GNDS R/L2020K-410	●	●	20	20	125	20	20	34	**4.0**	**10**	GC□ □40○○-□□	1	BX0520	**5.0**	LH040
GNDS R/L2020K-510	●	●	20	20	125	20	20	34	**5.0**	**10**	GC□ N50○○-□□	1			
GNDS R/L2020K-610	●	●	20	20	125	20	20	34	**6.0**	**10**	GC□ N60○○-□□	1			
GNDS R/L2525M-206	●	●	25	25	150	25	25	30	**2.0**	**6**	GC□ □20○○-□□	1			
GNDS R/L2525M-306	●	●	25	25	150	25	25	30	**3.0**	**6**	GC□ □30○○-□□	1			
GNDS R/L2525M-410	●	●	25	25	150	25	25	34	**4.0**	**10**	GC□ □40○○-□□	1	BX0520	**5.0**	LH040
GNDS R/L2525M-510	●	●	25	25	150	25	25	34	**5.0**	**10**	GC□ N50○○-□□	1			
GNDS R/L2525M-610	●	●	25	25	150	25	25	34	**6.0**	**10**	GC□ N60○○-□□	1			

Select holders and inserts with matching width of cut (CW). Refer to F29 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

N·m Recommended Tightening Torque (N·m)

GNDS type

Inserts for GNDS type

(Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

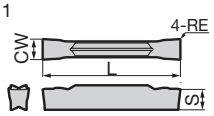


Fig 2 (Figure shows right-handed (R) tool.)

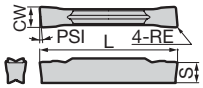


Fig 3

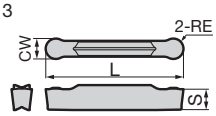
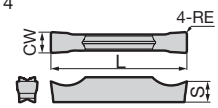


Fig 4



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0	5	1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0	5	1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2		1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8	5	2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8	5	2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

External Profiling / External Radius Grooving

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3015-RG	●	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	21.1	3.8		3
N4020-RG	●	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	26.4	4.0	5	3
GCM N5025-RG	●	●	●	●	●	●	●	●	—	5.0	±0.03	2.5	27.2	4.1		3
N6030-RG	●	●	●	●	●	●	●	●	—	6.0	±0.03	3.0	27.5	4.5		3

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U		Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●		2.0	±0.03	1.0	21.7	3.6		3
N3015-RN	●	●	●	●	●	●	●	●		3.0	±0.03	1.5	22.6	3.8		3
N4020-RN	●	●	●	●	●	●	●	●		4.0	±0.03	2.0	28.2	4.0	5	3
N5025-RN	●	●	●	●	●	●	●	●		5.0	±0.03	2.5	28.3	4.1		3
N6030-RN	●	●	●	●	●	●	●	●		6.0	±0.03	3.0	28.3	4.5		3

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10									Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●									2.0	±0.025	0.2	21.1	3.6		4
N3002-GA	●									3.0	±0.025	0.2	21.1	3.8		4
GCG N4004-GA	●									4.0	±0.025	0.4	26.4	4.0	5	4
N5004-GA	●									5.0	±0.025	0.4	26.4	4.1		4
N6004-GA	●									6.0	±0.025	0.4	26.4	4.5		4

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
External Profiling / External Radius Grooving	RG	Profiling / General-purpose
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDM type / GNDMS type

External

* For traverse cutting (groove expansion), use a multi-functional or profiling insert.

External Multi-Functional (Grooving, Traverse Cutting and Profiling) Clamp-on

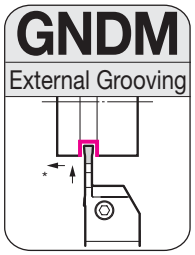


Fig 1

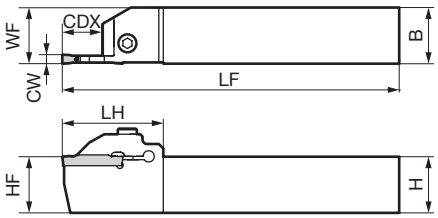


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw	N·m	Wrench
GNDM R/L2020K-1.2510	●	●	20	20	125	20	20	34.0	**1.25**	**10**	GCM N125005-GF	1	BX0520	**5.0**	LH040
GNDM R/L2020K-1.510	●	●	20	20	125	20	20	34.0	**1.50**	**10**	GCM N150005-GF	1			
GNDM R/L2020K-210	●	●	20	20	125	20	20	33.6	**2.00**	**10**	GC□ □20○○-□□	1			
GNDM R/L2020K-312	●	●	20	20	125	20	20	36.6	**3.00**	**12**	GC□ □30○○-□□	1			
GNDM R/L2020K-418	●	●	20	20	125	20	20	45.0	**4.00**	**18**	GC□ □40○○-□□	1			
GNDM R/L2020K-518	●	●	20	20	125	20	20	45.0	**5.00**	**18**	GC□ N50○○-□□	1			
GNDM R/L2020K-618	●	●	20	20	125	20	20	45.0	**6.00**	**18**	GC□ N60○○-□□	1			
GNDM R/L2525M-1.2510	●	●	25	25	150	25	25	36.0	**1.25**	**10**	GCM N125005-GF	1	BX0520	**5.0**	LH040
GNDM R/L2525M-1.510	●	●	25	25	150	25	25	36.0	**1.50**	**10**	GCM N150005-GF	1			
GNDM R/L2525M-210	●	●	25	25	150	25	25	33.6	**2.00**	**10**	GC□ □20○○-□□	1			
GNDM R/L2525M-312	●	●	25	25	150	25	25	36.6	**3.00**	**12**	GC□ □30○○-□□	1			
GNDM R/L2525M-418	●	●	25	25	150	25	25	45.0	**4.00**	**18**	GC□ □40○○-□□	1			
GNDM R/L2525M-518	●	●	25	25	150	25	25	45.0	**5.00**	**18**	GC□ N50○○-□□	1			
GNDM R/L2525M-618	●	●	25	25	150	25	25	45.0	**6.00**	**18**	GC□ N60○○-□□	1			
GNDM R/L3225P-312			32	25	170	25	32	36.6	**3.00**	**12**	GC□ □30○○-□□	1	BX0520	**5.0**	LH040
GNDM R/L3225P-418			32	25	170	25	32	45.0	**4.00**	**18**	GC□ □40○○-□□	1			
GNDM R/L3225P-518			32	25	170	25	32	45.0	**5.00**	**18**	GC□ N50○○-□□	1			
GNDM R/L3225P-618			32	25	170	25	32	45.0	**6.00**	**18**	GC□ N60○○-□□	1			
GNDM R/L3225P-718			32	25	170	25	32	50.0	**7.00**	**18**	GCM N70○○-□□	1	BX0620	**6.0**	LH050
GNDM R/L3225P-818			32	25	170	25	32	50.0	**8.00**	**18**	GCM N80○○-□□	1			
GNDM R/L3232P-312	●	●	32	32	170	32	32	36.6	**3.00**	**12**	GC□ □30○○-□□	1	BX0620	**6.0**	LH050
GNDM R/L3232P-418	●	●	32	32	170	32	32	45.0	**4.00**	**18**	GC□ □40○○-□□	1			
GNDM R/L3232P-518	●	●	32	32	170	32	32	45.0	**5.00**	**18**	GC□ N50○○-□□	1			
GNDM R/L3232P-618	●	●	32	32	170	32	32	45.0	**6.00**	**18**	GC□ N60○○-□□	1			
GNDM R/L3232P-718	●	●	32	32	170	32	32	50.0	**7.00**	**18**	GCM N70○○-□□	1			
GNDM R/L3232P-818	●	●	32	32	170	32	32	50.0	**8.00**	**18**	GCM N80○○-□□	1			

Select holders and inserts with matching width of cut (CW). Refer to F31 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

External

* For traverse cutting (groove expansion), use a multi-functional or profiling insert.

External L-Shaped (Side Cut), Multi-Functional (Grooving, Traverse Cutting and Profiling) Clamp-on

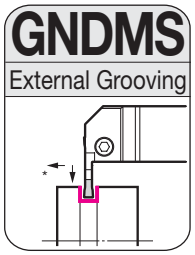


Fig 1

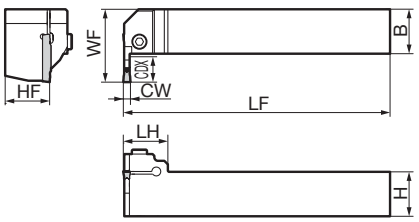


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw	N·m	Wrench
GNDMS R/L2020K-310	●	●	20	20	125	32	20	25.0	**3.0**	**10**	GC□ □30○○-□□	1	BX0520	**5.0**	LH040
GNDMS R/L2020K-412	●	●	20	20	125	34	20	25.0	**4.0**	**12**	GC□ □40○○-□□	1			
GNDMS R/L2020K-512	●	●	20	20	125	34	20	25.0	**5.0**	**12**	GC□ N50○○-□□	1			
GNDMS R/L2525M-312	●	●	25	25	150	39	25	25.0	**3.0**	**12**	GC□ □30○○-□□	1	BX0520	**5.0**	LH040
GNDMS R/L2525M-414	●	●	25	25	150	41	25	25.0	**4.0**	**14**	GC□ □40○○-□□	1			
GNDMS R/L2525M-514	●	●	25	25	150	41	25	25.0	**5.0**	**14**	GC□ N50○○-□□	1			
GNDMS R/L2525M-614	●	●	25	25	150	41	25	25.0	**6.0**	**14**	GC□ N60○○-□□	1			

Select holders and inserts with matching width of cut (CW). Refer to F31 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

N·m Recommended Tightening Torque (N·m)

GNDM type / GNDMS type

Inserts for GNDM type/GNDMS type

(Coated Carbide / Cermet / Cemented Carbide)

Fig 1

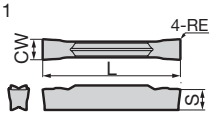


Fig 2 (Figure shows right-handed (R) tool.)

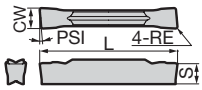


Fig 3

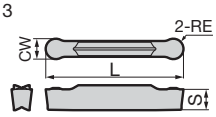
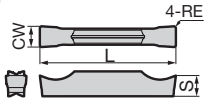


Fig 4



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1	5	1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N7004-MG	●	●		●	●	●		●	—	7.0	±0.04	0.4	28.8	5.5		1
N7008-MG	●	●	●	●	●	●	●	●	—	7.0	±0.04	0.8	28.8	5.5		1
GCM N8004-MG	●	●		●	●	●		●	—	8.0	±0.04	0.4	28.8	6.0		1
N8008-MG	●	●	●	●	●	●	●	●	—	8.0	±0.04	0.8	28.8	6.0		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1	5	1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N7004-ML	●	●	●	●	●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
N7008-ML	●	●		●	●	●		●	—	7.0	±0.04	0.8	28.8	5.5		1
GCM N8004-ML	●	●	●	●	●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
N8008-ML	●	●		●	●	●		●	—	8.0	±0.04	0.8	28.8	6.0		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.										Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1	5	1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7004-GG		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8004-GG		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1	5	1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7004-GL		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8004-GL		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2		1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1	5	1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7002-GF		●	●		●	●	●	●	—	7.0	±0.04	0.2	28.8	5.5		1
N7004-GF		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8002-GF		●	●		●	●	●	●	—	8.0	±0.04	0.2	28.8	6.0		1
N8004-GF		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8	5	2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

External Profiling / External Radius Grooving

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3015-RG	●	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	21.1	3.8		3
N4020-RG	●	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	26.4	4.0		3
GCM N5025-RG	●	●	●	●	●	●	●	●	—	5.0	±0.03	2.5	27.2	4.1	5	3
N6030-RG	●	●	●	●	●	●	●	●	—	6.0	±0.03	3.0	27.5	4.5		3
GCM N7035-RG	●	●	●	●	●	●	●	●	—	7.0	±0.04	3.5	29.1	5.5		3
N8040-RG	●	●	●	●	●	●	●	●	—	8.0	±0.04	4.0	29.3	6.0		3

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●	2.0	±0.03	1.0	21.7	3.6		3
N3015-RN	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	22.6	3.8		3
N4020-RN	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	28.2	4.0	5	3
N5025-RN	●	●	●	●	●	●	●	●	5.0	±0.03	2.5	28.3	4.1		3
N6030-RN	●	●	●	●	●	●	●	●	6.0	±0.03	3.0	28.3	4.5		3

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6		4
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		4
GCG N4004-GA	●								4.0	±0.025	0.4	26.4	4.0	5	4
N5004-GA	●								5.0	±0.025	0.4	26.4	4.1		4
N6004-GA	●								6.0	±0.025	0.4	26.4	4.5		4

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
External Profiling / External Radius Grooving	RG	Profiling / General-purpose
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDM-J type

External | Internal Coolant

* For traverse cutting (groove expansion), use a multi-functional or profiling insert.

External Multi-Functional
(Grooving, Traverse Cutting and Profiling)
Internal Coolant Supply, Clamp-on

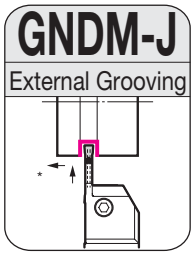


Fig 1

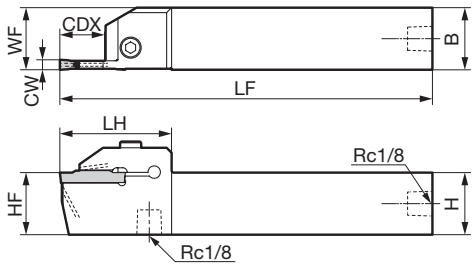


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw	Cap Screw N·m	Plug	Wrench
GNDM R/L2020K-210J	●	●	20	20	125	20	20	33.6	**2.00**	**10**	GC□ □20○○-□□	1				
R/L2020K-312J	●	●	20	20	125	20	20	36.6	**3.00**	**12**	GC□ □30○○-□□	1				
R/L2020K-418J	●	●	20	20	125	20	20	45	**4.00**	**18**	GC□ □40○○-□□	1	BX0520	**6.0**	XP02	LH040
R/L2020K-518J	●	●	20	20	125	20	20	45	**5.00**	**18**	GC□ N50○○-□□	1				
R/L2020K-618J	●	●	20	20	125	20	20	45	**6.00**	**18**	GC□ N60○○-□□	1				
GNDM R/L2525K-210J	●	●	25	25	125	25	25	33.6	**2.00**	**10**	GC□ □20○○-□□	1				
R/L2525K-312J	●	●	25	25	125	25	25	36.6	**3.00**	**12**	GC□ □30○○-□□	1				
R/L2525K-418J	●	●	25	25	125	25	25	45	**4.00**	**18**	GC□ □40○○-□□	1	BX0520	**6.0**	XP02	LH040
R/L2525K-518J	●	●	25	25	125	25	25	45	**5.00**	**18**	GC□ N50○○-□□	1				
R/L2525K-618J	●	●	25	25	125	25	25	45	**6.00**	**18**	GC□ N60○○-□□	1				

Select holders and inserts with matching width of cut (CW). Refer to F33 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

Fig 1

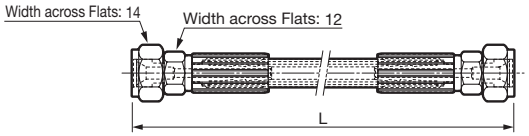


Fig 1

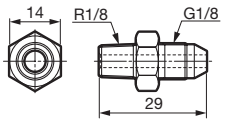
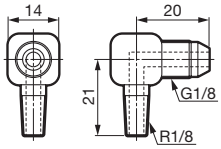


Fig 2



Parts (Hose)

Dimensions (mm)

Cat. No.	Stock	L	Screw Standard	Screw Standard	Fig
J-HOSE-G1/8-G1/8-200	●	200	G1/8	G1/8	1
J-HOSE-G1/8-G1/8-300	●	300	G1/8	G1/8	1

Hoses are sold separately.

Piping Method for Hoses and Connectors F23

Parts (Connector)

Dimensions (mm)

Cat. No.	Stock	Screw Standard	Screw Standard	Fig
J-G1/8-R1/8-00	●	G1/8	R1/8	1
J-G1/8-R1/8-90	●	G1/8	R1/8	2

Connectors are sold separately.

Piping Method for Hoses and Connectors F23

N·m Recommended Tightening Torque (N·m)

GNDM-J type

Inserts for GNDM-J type

(Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

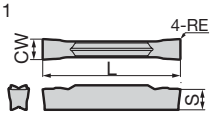


Fig 2 (Figure shows right-handed (R) tool.)

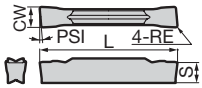


Fig 3

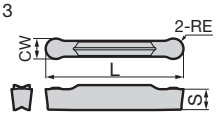
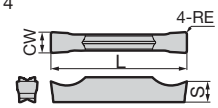


Fig 4



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N2002-ML	—	—	—	—	●	●	●	●	●	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2	5	1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

External Profiling / External Radius Grooving

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3015-RG	●	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	21.1	3.8	5	3
N4020-RG	●	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	26.4	4.0		3
GCM N5025-RG	●	●	●	●	●	●	●	●	—	5.0	±0.03	2.5	27.2	4.1		3
N6030-RG	●	●	●	●	●	●	●	●	—	6.0	±0.03	3.0	27.5	4.5		3

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U		Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●		2.0	±0.03	1.0	21.7	3.6	5	3
N3015-RN	●	●	●	●	●	●	●	●		3.0	±0.03	1.5	22.6	3.8		3
N4020-RN	●	●	●	●	●	●	●	●		4.0	±0.03	2.0	28.2	4.0		3
N5025-RN	●	●	●	●	●	●	●	●		5.0	±0.03	2.5	28.3	4.1		3
N6030-RN	●	●	●	●	●	●	●	●		6.0	±0.03	3.0	28.3	4.5		3

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10									Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●									2.0	±0.025	0.2	21.1	3.6	5	4
N3002-GA	●									3.0	±0.025	0.2	21.1	3.8		4
GCG N4004-GA	●									4.0	±0.025	0.4	26.4	4.0		4
N5004-GA	●									5.0	±0.025	0.4	26.4	4.1		4
N6004-GA	●									6.0	±0.025	0.4	26.4	4.5		4

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
External Profiling / External Radius Grooving	RG	Profiling / General-purpose
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 | Precautions for Use F22 | Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDL type/GNDLS type

External

External Deep Grooving & Cut-off
Clamp-on

GNDL
External Grooving

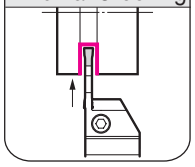


Fig 1

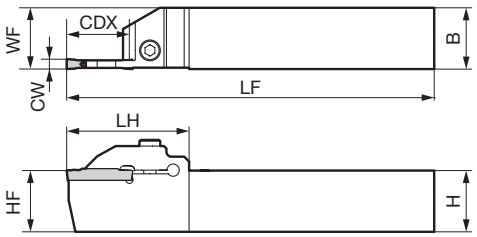


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw BX0520 / BX0620	Cap Screw N·m	Wrench
GNDL R/L2020K-1.2516	●	●	20	20	125	20	20	38.0	**1.25**	**16**	GCM N125005-GF	1			
GNDL R/L2020K-1.516	●	●	20	20	125	20	20	38.0	**1.50**	**16**	GCM N150005-GF	1			
GNDL R/L2020K-220	●	●	20	20	125	20	20	44.5	**2.00**	**20**(18)	GC□ □20○○-□□	1			
GNDL R/L2020K-320	●	●	20	20	125	20	20	44.5	**3.00**	**20**(18)	GC□ □30○○-□□	1	BX0520	**5.0**	LH040
GNDL R/L2020K-425	●	●	20	20	125	20	20	50.0	**4.00**	**25**(23)	GC□ □40○○-□□	1			
GNDL R/L2020K-525	●	●	20	20	125	20	20	50.0	**5.00**	**25**(23)	GC□ N50○○-□□	1			
GNDL R/L2020K-625	●	●	20	20	125	20	20	50.0	**6.00**	**25**(23)	GC□ N60○○-□□	1			
GNDL R/L2525M-1.2516	●	●	25	25	150	25	25	40.0	**1.25**	**16**	GCM N125005-GF	1			
GNDL R/L2525M-1.516	●	●	25	25	150	25	25	40.0	**1.50**	**16**	GCM N150005-GF	1			
GNDL R/L2525M-220	●	●	25	25	150	25	25	44.5	**2.00**	**20**(18)	GC□ □20○○-□□	1			
GNDL R/L2525M-320	●	●	25	25	150	25	25	44.5	**3.00**	**20**(18)	GC□ □30○○-□□	1	BX0520	**5.0**	LH040
GNDL R/L2525M-425	●	●	25	25	150	25	25	50.0	**4.00**	**25**(23)	GC□ □40○○-□□	1			
GNDL R/L2525M-525	●	●	25	25	150	25	25	50.0	**5.00**	**25**(23)	GC□ N50○○-□□	1			
GNDL R/L2525M-625	●	●	25	25	150	25	25	50.0	**6.00**	**25**(23)	GC□ N60○○-□□	1			
GNDL R/L3225P-320			32	25	170	25	32	44.5	**3.00**	**20**(18)	GC□ □30○○-□□	1			
GNDL R/L3225P-425			32	25	170	25	32	50.0	**4.00**	**25**(23)	GC□ □40○○-□□	1	BX0520	**5.0**	LH040
GNDL R/L3225P-525			32	25	170	25	32	50.0	**5.00**	**25**(23)	GC□ N50○○-□□	1			
GNDL R/L3225P-625			32	25	170	25	32	50.0	**6.00**	**25**(23)	GC□ N60○○-□□	1			
GNDL R/L3225P-725			32	25	170	25	32	50.0	**7.00**	**25**(23)	GCM N70○○-□□	1	BX0620	**6.0**	LH050
GNDL R/L3225P-825			32	25	170	25	32	50.0	**8.00**	**25**(23)	GCM N80○○-□□	1			
GNDL R/L3232P-320	●	●	32	32	170	32	32	44.5	**3.00**	**20**(18)	GC□ □30○○-□□	1			
GNDL R/L3232P-425	●	●	32	32	170	32	32	50.0	**4.00**	**25**(23)	GC□ □40○○-□□	1			
GNDL R/L3232P-525	●	●	32	32	170	32	32	50.0	**5.00**	**25**(23)	GC□ N50○○-□□	1	BX0620	**6.0**	LH050
GNDL R/L3232P-625	●	●	32	32	170	32	32	50.0	**6.00**	**25**(23)	GC□ N60○○-□□	1			
GNDL R/L3232P-725	●	●	32	32	170	32	32	50.0	**7.00**	**25**(23)	GCM N70○○-□□	1			
GNDL R/L3232P-825	●	●	32	32	170	32	32	50.0	**8.00**	**25**(23)	GCM N80○○-□□	1			

Select holders and inserts with matching width of cut (CW). Dimensions in parentheses under maximum groove depth are for profiling inserts (RG type / RN type chipbreakers).
Refer to F35 for applicable inserts. The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

External

External L-Shaped (Side Cut), Grooving
Clamp-on

GNDLS
External Grooving

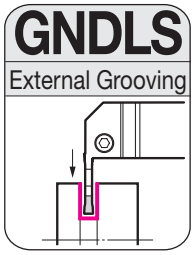


Fig 1

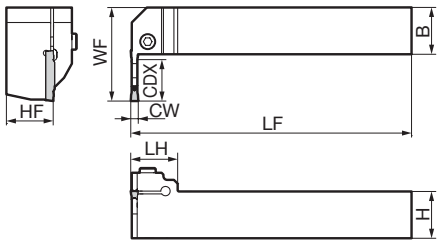


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw	Cap Screw N·m	Wrench
GNDLS R/L2020K-216	●	●	20	20	125	38	20	25	**2.0**	**16**	GC□ □20○○-□□	1	BX0520	**5.0**	LH040
GNDLS R/L2020K-316	●	●	20	20	125	38	20	25	**3.0**	**16**	GC□ □30○○-□□	1			
GNDLS R/L2525M-218	●	●	25	25	150	45	25	25	**2.0**	**18**	GC□ □20○○-□□	1			
GNDLS R/L2525M-318	●	●	25	25	150	45	25	25	**3.0**	**18**	GC□ □30○○-□□	1			
GNDLS R/L2525M-423	●	●	25	25	150	50	25	25	**4.0**	**23**	GC□ □40○○-□□	1	BX0520	**5.0**	LH040
GNDLS R/L2525M-523	●	●	25	25	150	50	25	25	**5.0**	**23**	GC□ N50○○-□□	1			
GNDLS R/L2525M-623	●	●	25	25	150	50	25	25	**6.0**	**23**	GC□ N60○○-□□	1			

Select holders and inserts with matching width of cut (CW). Refer to F35 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

N·m Recommended Tightening Torque (N·m)

GNDL type/GNDLS type

Inserts for GNDL type/GNDLS type

(Coated Carbide / Cermet / Cemented Carbide)

Fig 1

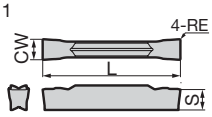


Fig 2 (Figure shows right-handed (R) tool.)

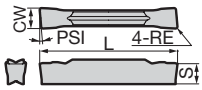


Fig 3

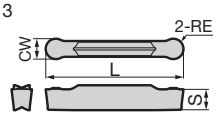
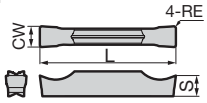


Fig 4



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1	5	1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N7004-MG	●	●		●	●	●		●	—	7.0	±0.04	0.4	28.8	5.5		1
N7008-MG	●	●	●	●	●	●	●	●	—	7.0	±0.04	0.8	28.8	5.5		1
GCM N8004-MG	●	●		●	●	●		●	—	8.0	±0.04	0.4	28.8	6.0		1
N8008-MG	●	●	●	●	●	●	●	●	—	8.0	±0.04	0.8	28.8	6.0		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1	5	1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N7004-ML	●	●	●	●	●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
N7008-ML	●	●		●	●	●		●	—	7.0	±0.04	0.8	28.8	5.5		1
GCM N8004-ML	●	●	●	●	●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
N8008-ML	●	●		●	●	●		●	—	8.0	±0.04	0.8	28.8	6.0		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.										Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1	5	1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7004-GG		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8004-GG		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1	5	1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7004-GL		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8004-GL		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2		1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1	5	1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7002-GF		●	●		●	●	●	●	—	7.0	±0.04	0.2	28.8	5.5		1
N7004-GF		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8002-GF		●	●		●	●	●	●	—	8.0	±0.04	0.2	28.8	6.0		1
N8004-GF		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8	5	2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

External Profiling / External Radius Grooving

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3015-RG	●	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	21.1	3.8		3
N4020-RG	●	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	26.4	4.0		3
GCM N5025-RG	●	●	●	●	●	●	●	●	—	5.0	±0.03	2.5	27.2	4.1	5	3
N6030-RG	●	●	●	●	●	●	●	●	—	6.0	±0.03	3.0	27.5	4.5		3
GCM N7035-RG	●	●	●	●	●	●	●	●	—	7.0	±0.04	3.5	29.1	5.5		3
N8040-RG	●	●	●	●	●	●	●	●	—	8.0	±0.04	4.0	29.3	6.0		3

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●	2.0	±0.03	1.0	21.7	3.6		3
N3015-RN	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	22.6	3.8		3
N4020-RN	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	28.2	4.0	5	3
N5025-RN	●	●	●	●	●	●	●	●	5.0	±0.03	2.5	28.3	4.1		3
N6030-RN	●	●	●	●	●	●	●	●	6.0	±0.03	3.0	28.3	4.5		3

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6		4
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		4
GCG N4004-GA	●								4.0	±0.025	0.4	26.4	4.0	5	4
N5004-GA	●								5.0	±0.025	0.4	26.4	4.1		4
N6004-GA	●								6.0	±0.025	0.4	26.4	4.5		4

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
External Profiling / External Radius Grooving	RG	Profiling / General-purpose
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 | Precautions for Use F22 | Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDL-J type

External | Internal Coolant

External Deep Grooving and Cut-off
Internal Coolant Supply,
Clamp-on

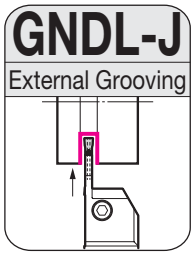


Fig 1

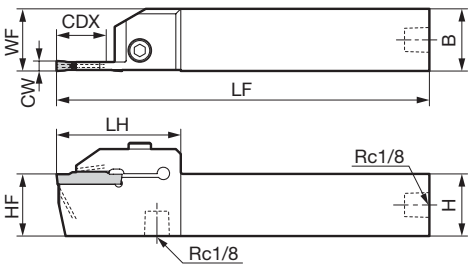


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw	N·m	Plug	Wrench
GNDL R/L2020K-220J	●	●	20	20	125	20	20	44.5	**2.00**	**20**(18)	GC□ □20○○-□□	1				
R/L2020K-320J	●	●	20	20	125	20	20	44.5	**3.00**	**20**(18)	GC□ □30○○-□□	1				
R/L2020K-425J	●	●	20	20	125	20	20	50	**4.00**	**25**(23)	GC□ □40○○-□□	1	BX0520	**6.0**	XP02	LH040
R/L2020K-525J	●	●	20	20	125	20	20	50	**5.00**	**25**(23)	GC□ N50○○-□□	1				
R/L2020K-625J	●	●	20	20	125	20	20	50	**6.00**	**25**(23)	GC□ N60○○-□□	1				
GNDL R/L2525K-220J	●	●	25	25	125	25	25	44.5	**2.00**	**20**(18)	GC□ □20○○-□□	1				
R/L2525K-320J	●	●	25	25	125	25	25	44.5	**3.00**	**20**(18)	GC□ □30○○-□□	1				
R/L2525K-425J	●	●	25	25	125	25	25	50	**4.00**	**25**(23)	GC□ □40○○-□□	1	BX0520	**6.0**	XP02	LH040
R/L2525K-525J	●	●	25	25	125	25	25	50	**5.00**	**25**(23)	GC□ N50○○-□□	1				
R/L2525K-625J	●	●	25	25	125	25	25	50	**6.00**	**25**(23)	GC□ N60○○-□□	1				

Select holders and inserts with matching width of cut (CW). Dimensions in parentheses under maximum groove depth are for profiling inserts (RG type / RN type chipbreakers). Refer to F37 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

Fig 1

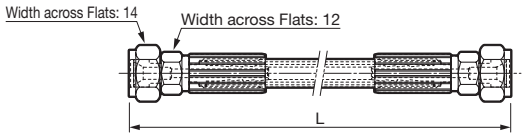


Fig 1

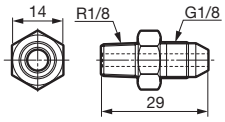
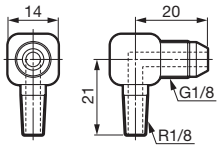


Fig 2



Parts (Hose)

Dimensions (mm)

Cat. No.	Stock	L	Screw Standard	Screw Standard	Fig
J-HOSE-G1/8-G1/8-200	●	200	G1/8	G1/8	1
J-HOSE-G1/8-G1/8-300	●	300	G1/8	G1/8	1

Hoses are sold separately.

Piping Method for Hoses and Connectors F23

Parts (Connector)

Dimensions (mm)

Cat. No.	Stock	Screw Standard	Screw Standard	Fig
J-G1/8-R1/8-00	●	G1/8	R1/8	1
J-G1/8-R1/8-90	●	G1/8	R1/8	2

Connectors are sold separately.

Piping Method for Hoses and Connectors F23

N·m Recommended Tightening Torque (N·m)

GNDL-J type

Inserts for GNDL-J type

(Coated Carbide / Cermet / Cemented Carbide)

Fig 1

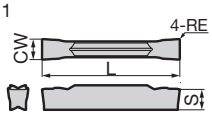


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3

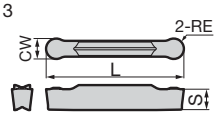
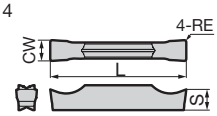


Fig 4



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2	5	1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

External Profiling / External Radius Grooving

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3015-RG	●	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	21.1	3.8	5	3
N4020-RG	●	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	26.4	4.0		3
GCM N5025-RG	●	●	●	●	●	●	●	●	—	5.0	±0.03	2.5	27.2	4.1		3
N6030-RG	●	●	●	●	●	●	●	●	—	6.0	±0.03	3.0	27.5	4.5		3

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U		Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●		2.0	±0.03	1.0	21.7	3.6	5	3
N3015-RN	●	●	●	●	●	●	●	●		3.0	±0.03	1.5	22.6	3.8		3
N4020-RN	●	●	●	●	●	●	●	●		4.0	±0.03	2.0	28.2	4.0		3
N5025-RN	●	●	●	●	●	●	●	●		5.0	±0.03	2.5	28.3	4.1		3
N6030-RN	●	●	●	●	●	●	●	●		6.0	±0.03	3.0	28.3	4.5		3

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10									Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●									2.0	±0.025	0.2	21.1	3.6	5	4
N3002-GA	●									3.0	±0.025	0.2	21.1	3.8		4
GCG N4004-GA	●									4.0	±0.025	0.4	26.4	4.0		4
N5004-GA	●									5.0	±0.025	0.4	26.4	4.1		4
N6004-GA	●									6.0	±0.025	0.4	26.4	4.5		4

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
External Profiling / External Radius Grooving	RG	Profiling / General-purpose
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDXL type

New External

External Deep Grooving and Cut-off
Clamp-on

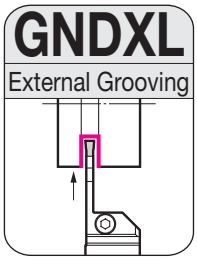


Fig 1

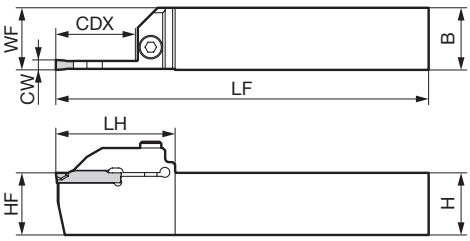


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw	Cap Screw N·m	Wrench
GNDXL R/L2020K-226			20	20	125	20	20	42.0	**2.0**	**26**	GCM N2002-GF1	1			
R/L2020K-332	●	●	20	20	125	20	20	48.0	**3.0**	**32**	GCM N30○○-□□1	1			
R/L2020K-432	●	●	20	20	125	20	20	48.0	**4.0**	**32**	GCM N40○○-□□1	1	BX0520	**5.0**	LH040
R/L2020K-532	●	●	20	20	125	20	20	48.0	**5.0**	**32**	GCM N50○○-□□1	1			
R/L2020K-632	●	●	20	20	125	20	20	48.0	**6.0**	**32**	GCM N60○○-□□1	1			
GNDXL R/L2525M-226			25	25	150	25	25	42.0	**2.0**	**26**	GCM N2002-GF1	1			
R/L2525M-332	●	●	25	25	150	25	25	48.0	**3.0**	**32**	GCM N30○○-□□1	1			
R/L2525M-432	●	●	25	25	150	25	25	48.0	**4.0**	**32**	GCM N40○○-□□1	1	BX0520	**5.0**	LH040
R/L2525M-532	●	●	25	25	150	25	25	48.0	**5.0**	**32**	GCM N50○○-□□1	1			
R/L2525M-632	●	●	25	25	150	25	25	48.0	**6.0**	**32**	GCM N60○○-□□1	1			

Select holders and inserts with matching width of cut (CW). Only 1-cornered inserts can be used. Refer to F39 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item (new product/expanded item)

GNDXL type

New

Inserts for GNDXL type (1-cornered)

(Coated Carbide)

Fig 1

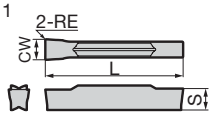
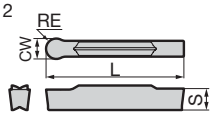


Fig 2



Grooving / Traverse Cutting (1-cornered)

Dimensions (mm)

Cat. No.	AC5015S	AC5025S	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
				Width of Cut	Tolerance	RE	L	S		
GCM N3002-ML1	●	●	●	**3.0**	±0.03	0.2	21.1	3.8	5	1
GCM N4004-ML1	●	●	●	**4.0**	±0.03	0.4	26.4	4.0		1
GCM N5004-ML1	●	●	●	**5.0**	±0.03	0.4	26.4	4.1		1
GCM N6004-ML1	●	●	●	**6.0**	±0.03	0.4	26.4	4.5		1

Profiling / Radius Grooving (1-cornered)

Dimensions (mm)

Cat. No.	AC5015S	AC5025S	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
				Width of Cut	Tolerance	RE	L	S		
GCM N3015-RN1	●	●	●	**3.0**	±0.03	1.5	22.6	3.8	5	2
GCM N6030-RN1	●	●	●	**6.0**	±0.03	3.0	28.3	4.5		2

Grooving / Cut-off (1-cornered)

Dimensions (mm)

Cat. No.	AC5015S	AC5025S	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
				Width of Cut	Tolerance	RE	L	S		
GCM N2002-GF1				**2.0**	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GF1	●	●	●	**3.0**	±0.03	0.2	21.1	3.8		1
GCM N4002-GF1	●	●	●	**4.0**	±0.03	0.2	26.4	4.0		1
GCM N5002-GF1	●	●	●	**5.0**	±0.03	0.2	26.4	4.1		1
GCM N6002-GF1	●	●	●	**6.0**	±0.03	0.2	26.4	4.5		1

Select holders and inserts with matching width of cut (CW). Use in combination with GNDXL type holders. Not usable with GNDIS type holders.

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications	Type	Symbol	Applications
Grooving / Traverse Cutting	ML1	Multi-functional / Low-feed	Profiling / Radius Grooving	RN1	General-purpose
Grooving / Cut-off	GF1	Grooving / Low cutting force			

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

● mark: Standard stocked item (new product/expanded item)

GNDN type

Necking

Necking
Clamp-on

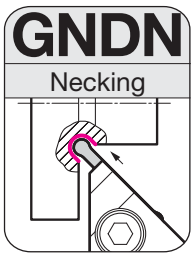
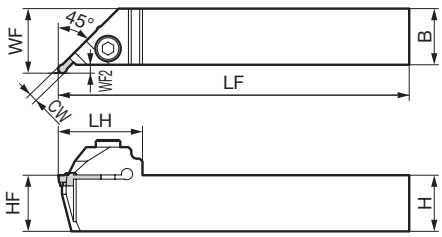


Fig 1



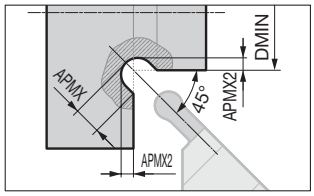


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge Distance	Cutting Edge Height	Head	Offset	Min. Bore Dia.	Width of Cut	APMX	APMX2	Applicable Insert	Fig	Cap Screw		Wrench
	R	L	H	B	LF	WF	HF	LH	WF2	DMIN	CW						N·m	
GNDN R/L2020K-215-020	●	●	20	20	125	23	20	35	3.0	**20**	**2.0**	1.5	0.64	GCM N2010-RN	1			
GNDN R/L2020K-320-020	●	●	20	20	125	23	20	35	3.0	**20**	**3.0**	2.0	0.79	GCM N3015-RN	1			
GNDN R/L2020K-430-030	●	●	20	20	125	24	20	37	4.0	**30**	**4.0**	3.0	1.29	GCM N4020-RN	1	BX0520	**5.0**	LH040
GNDN R/L2020K-535-030	●	●	20	20	125	25	20	40	5.0	**30**	**5.0**	3.5	1.44	GCM N5025-RN	1			
GNDN R/L2020K-640-030	●	●	20	20	125	25	20	40	5.0	**30**	**6.0**	4.0	1.59	GCM N6030-RN	1			
GNDN R/L2525M-215-020	●	●	25	25	150	28	25	35	3.0	**20**	**2.0**	1.5	0.64	GCM N2010-RN	1			
GNDN R/L2525M-320-020	●	●	25	25	150	28	25	35	3.0	**20**	**3.0**	2.0	0.79	GCM N3015-RN	1			
GNDN R/L2525M-430-030	●	●	25	25	150	29	25	37	4.0	**30**	**4.0**	3.0	1.29	GCM N4020-RN	1	BX0520	**5.0**	LH040
GNDN R/L2525M-535-030	●	●	25	25	150	30	25	40	5.0	**30**	**5.0**	3.5	1.44	GCM N5025-RN	1			
GNDN R/L2525M-640-030	●	●	25	25	150	30	25	40	5.0	**30**	**6.0**	4.0	1.59	GCM N6030-RN	1			

Select holders and inserts with matching width of cut (CW). Refer to F41 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

Identification Code

GND N R 20 20 K - 2 15 - 020

Series Code	Application Symbol: Necking	Feed Direction	Shank Height (mm)	Shank Width (mm)	Shank Length	Width of Cut (mm)	APMX ×10 (mm)	Min. Bore Dia. (mm)

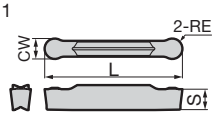
N·m Recommended Tightening Torque (N·m)

GNDN type

Inserts for GNDN type

(Coated Carbide)

Fig 1



Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●	**2.0**	±0.03	1.0	21.7	3.6		1
N3015-RN	●	●	●	●	●	●	●	●	**3.0**	±0.03	1.5	22.6	3.8		1
N4020-RN	●	●	●	●	●	●	●	●	**4.0**	±0.03	2.0	28.2	4.0	5	1
N5025-RN	●	●	●	●	●	●	●	●	**5.0**	±0.03	2.5	28.3	4.1		1
N6030-RN	●	●	●	●	●	●	●	●	**6.0**	±0.03	3.0	28.3	4.5		1

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose

Chipbreaker Selection ☞ F13 Precautions for Use ☞ F22 Recommended Cutting Conditions ☞ F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDF type

Facing

* For traverse cutting (groove expansion), use a multi-functional or profiling insert.

Face Grooving
Clamp-on

GNDF
Face Grooving

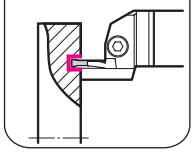
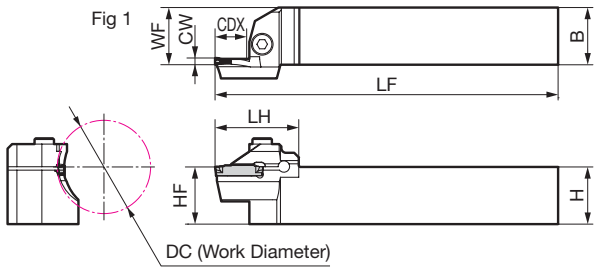


Fig 1



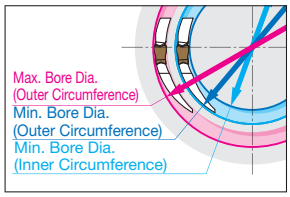


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Machining diameter DC	Min. Bore Dia Inner Circumference	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw	N·m	Wrench
GNDF R/L2020K-312-035	●	●	20	20	125	20	20	35.6	35 to 45	29	3.0	12		1			
GNDF R/L2020K-312-040	●	●	20	20	125	20	20	35.6	40 to 55	34	3.0	12		1			
GNDF R/L2020K-318-050	●	●	20	20	125	20	20	41.6	50 to 70	44	3.0	18		1			
GNDF R/L2020K-318-065	●	●	20	20	125	20	20	41.6	65 to 100	59	3.0	18	GC□ N30○○-□□	1	BX0520	5.0	LH040
GNDF R/L2020K-318-090	●	●	20	20	125	20	20	41.6	90 to 150	84	3.0	18		1			
GNDF R/L2020K-318-140	●	●	20	20	125	20	20	41.6	140 to 200	134	3.0	18		1			
GNDF R/L2020K-318-180	●	●	20	20	125	20	20	41.6	180 to 300	174	3.0	18		1			
GNDF R/L2020K-418-040	●	●	20	20	125	20	20	41.6	40 to 55	32	4.0	18		1			
GNDF R/L2020K-423-050	●	●	20	20	125	20	20	46.6	50 to 70	42	4.0	23		1			
GNDF R/L2020K-423-065	●	●	20	20	125	20	20	46.6	65 to 90	57	4.0	23		1			
GNDF R/L2020K-423-085	●	●	20	20	125	20	20	46.6	85 to 130	77	4.0	23	GC□ N40○○-□□	1	BX0520	5.0	LH040
GNDF R/L2020K-423-125	●	●	20	20	125	20	20	46.6	125 to 200	117	4.0	23		1			
GNDF R/L2020K-423-180	●	●	20	20	125	20	20	46.6	180 to 300	172	4.0	23		1			
GNDF R/L2020K-423-280	●	●	20	20	125	20	20	46.6	280 to 1000	272	4.0	23		1			
GNDF R/L2020K-523-050	●	●	20	20	125	20	20	46.6	50 to 70	40	5.0	23		1			
GNDF R/L2020K-523-065	●	●	20	20	125	20	20	46.6	65 to 90	55	5.0	23		1			
GNDF R/L2020K-523-085	●	●	20	20	125	20	20	46.6	85 to 130	75	5.0	23		1			
GNDF R/L2020K-523-125	●	●	20	20	125	20	20	46.6	125 to 200	115	5.0	23	GC□ N50○○-□□	1	BX0520	5.0	LH040
GNDF R/L2020K-523-180	●	●	20	20	125	20	20	46.6	180 to 300	170	5.0	23		1			
GNDF R/L2020K-523-280	●	●	20	20	125	20	20	46.6	280 to 1000	270	5.0	23		1			
GNDF R/L2020K-623-050	●	●	20	20	125	20	20	46.6	50 to 75	38	6.0	23		1			
GNDF R/L2020K-623-070	●	●	20	20	125	20	20	46.6	70 to 110	58	6.0	23		1			
GNDF R/L2020K-623-100	●	●	20	20	125	20	20	46.6	100 to 200	88	6.0	23	GC□ N60○○-□□	1	BX0520	5.0	LH040
GNDF R/L2020K-623-180	●	●	20	20	125	20	20	46.6	180 to 300	168	6.0	23		1			
GNDF R/L2020K-623-280	●	●	20	20	125	20	20	46.6	280 to 1000	268	6.0	23		1			
GNDF R/L2525M-312-035	●	●	25	25	150	25	25	35.6	35 to 45	29	3.0	12		1			
GNDF R/L2525M-312-040	●	●	25	25	150	25	25	35.6	40 to 55	34	3.0	12		1			
GNDF R/L2525M-318-050	●	●	25	25	150	25	25	41.6	50 to 70	44	3.0	18		1			
GNDF R/L2525M-318-065	●	●	25	25	150	25	25	41.6	65 to 100	59	3.0	18	GC□ N30○○-□□	1	BX0520	5.0	LH040
GNDF R/L2525M-318-090	●	●	25	25	150	25	25	41.6	90 to 150	84	3.0	18		1			
GNDF R/L2525M-318-140	●	●	25	25	150	25	25	41.6	140 to 200	134	3.0	18		1			
GNDF R/L2525M-318-180	●	●	25	25	150	25	25	41.6	180 to 300	174	3.0	18		1			
GNDF R/L2525M-418-040	●	●	25	25	150	25	25	41.6	40 to 55	32	4.0	18		1			
GNDF R/L2525M-423-050	●	●	25	25	150	25	25	46.6	50 to 70	42	4.0	23		1			
GNDF R/L2525M-423-065	●	●	25	25	150	25	25	46.6	65 to 90	57	4.0	23		1			
GNDF R/L2525M-423-085	●	●	25	25	150	25	25	46.6	85 to 130	77	4.0	23	GC□ N40○○-□□	1	BX0520	5.0	LH040
GNDF R/L2525M-423-125	●	●	25	25	150	25	25	46.6	125 to 200	117	4.0	23		1			
GNDF R/L2525M-423-180	●	●	25	25	150	25	25	46.6	180 to 300	172	4.0	23		1			
GNDF R/L2525M-423-280	●	●	25	25	150	25	25	46.6	280 to 1000	272	4.0	23		1			
GNDF R/L2525M-523-050	●	●	25	25	150	25	25	46.6	50 to 70	40	5.0	23		1			
GNDF R/L2525M-523-065	●	●	25	25	150	25	25	46.6	65 to 90	55	5.0	23		1			
GNDF R/L2525M-523-085	●	●	25	25	150	25	25	46.6	85 to 130	75	5.0	23		1			
GNDF R/L2525M-523-125	●	●	25	25	150	25	25	46.6	125 to 200	115	5.0	23	GC□ N50○○-□□	1	BX0520	5.0	LH040
GNDF R/L2525M-523-180	●	●	25	25	150	25	25	46.6	180 to 300	170	5.0	23		1			
GNDF R/L2525M-523-280	●	●	25	25	150	25	25	46.6	280 to 1000	270	5.0	23		1			
GNDF R/L2525M-623-050	●	●	25	25	150	25	25	46.6	50 to 75	38	6.0	23		1			
GNDF R/L2525M-623-070	●	●	25	25	150	25	25	46.6	70 to 110	58	6.0	23		1			
GNDF R/L2525M-623-100	●	●	25	25	150	25	25	46.6	100 to 200	88	6.0	23		1			
GNDF R/L2525M-623-180	●	●	25	25	150	25	25	46.6	180 to 300	168	6.0	23	GC□ N60○○-□□	1	BX0520	5.0	LH040
GNDF R/L2525M-623-280	●	●	25	25	150	25	25	46.6	280 to 1000	268	6.0	23		1			

Select holders and inserts with matching width of cut (CW). Refer to F43 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

N·m Recommended Tightening Torque (N·m)

GNDF type

Inserts for GNDF type

(Coated Carbide / Cermet / Cemented Carbide)

Fig 1

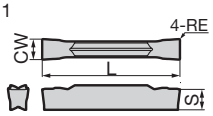


Fig 2

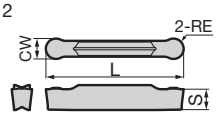
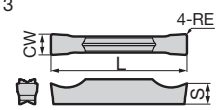


Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	**3.0**	±0.03	0.2	21.1	3.8		1
N3004-MG	●	●	●	●	●	●	●	●	—	**3.0**	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	**4.0**	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	**4.0**	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	**4.0**	±0.03	0.8	26.4	4.0	5	1
GCM N5004-MG	●	●		●	●	●		●	—	**5.0**	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	**5.0**	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	**6.0**	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	**6.0**	±0.03	0.8	26.4	4.5		1
GCM N3002-ML	●	●	●	●	●	●	●	●	—	**3.0**	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	—	**3.0**	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	—	**4.0**	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	—	**4.0**	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	—	**4.0**	±0.03	0.8	26.4	4.0	5	1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	**5.0**	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	**5.0**	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	**6.0**	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	**6.0**	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-GG		●	●		●	●	●	●	—	**3.0**	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	**3.0**	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	**4.0**	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	**4.0**	±0.03	0.4	26.4	4.0		1
GCM N5002-GG		●	●		●	●	●	●	—	**5.0**	±0.03	0.2	26.4	4.1	5	1
N5004-GG		●	●		●	●	●	●	—	**5.0**	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	**6.0**	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	**6.0**	±0.03	0.4	26.4	4.5		1
GCM N3002-GL		●	●		●	●	●	●	—	**3.0**	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	**3.0**	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	**4.0**	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	**4.0**	±0.03	0.4	26.4	4.0		1
GCM N5002-GL		●	●		●	●	●	●	—	**5.0**	±0.03	0.2	26.4	4.1	5	1
N5004-GL		●			●	●		●	—	**5.0**	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	**6.0**	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	**6.0**	±0.03	0.4	26.4	4.5		1
GCM N3002-GF		●	●		●	●	●	●	●	**3.0**	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	**3.0**	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	**4.0**	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	**4.0**	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	**5.0**	±0.03	0.2	26.4	4.1	5	1
N5004-GF		●			●	●		●	—	**5.0**	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	**6.0**	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	**6.0**	±0.03	0.4	26.4	4.5		1

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCM N3015-RN	●	●	●	●	●	●	●	●	**3.0**	±0.03	1.5	22.6	3.8		2
N4020-RN	●	●	●	●	●	●	●	●	**4.0**	±0.03	2.0	28.2	4.0	5	2
N5025-RN	●	●	●	●	●	●	●	●	**5.0**	±0.03	2.5	28.3	4.1		2
N6030-RN	●	●	●	●	●	●	●	●	**6.0**	±0.03	3.0	28.3	4.5		2

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N3002-GA	●								**3.0**	±0.025	0.2	21.1	3.8		3
GCG N4004-GA	●								**4.0**	±0.025	0.4	26.4	4.0	5	3
N5004-GA	●								**5.0**	±0.025	0.4	26.4	4.1		3
N6004-GA	●								**6.0**	±0.025	0.4	26.4	4.5		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDFS type

Facing

* For traverse cutting (groove expansion), use a multi-functional or profiling insert.

Deep Face Grooving L-Shaped (Side Cut)
Clamp-on

GNDFS
Face Grooving

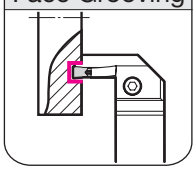


Fig 1

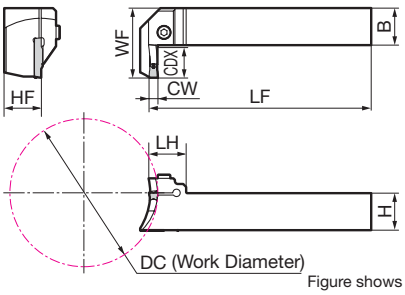
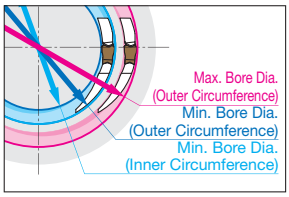


Figure shows right-handed (R) tool.



Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Machining diameter DC	Min. Bore Diameter Inner Circumference	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Cap Screw BX0520 / BX0620	Cap Screw N·m	Wrench
GNDFS R/L2525M-620-070			25	25	150	47	25	25	70 to 100	58	**6.0**	**20**		1			
GNDFS R/L2525M-620-100			25	25	150	47	25	25	100 to 200	88	**6.0**	**20**		1			
GNDFS R/L2525M-620-180			25	25	150	47	25	25	180 to 300	168	**6.0**	**20**	GC□ N60○○-□□	1	BX0520	**5.0**	LH040
GNDFS R/L2525M-620-280			25	25	150	47	25	25	280 to 1000	268	**6.0**	**20**		1			
GNDFS R/L2525M-620-450			25	25	150	47	25	25	450 up	438	**6.0**	**20**		1			
GNDFS R/L3232P-620-070			32	32	170	54	32	25	70 to 100	58	**6.0**	**20**		1			
GNDFS R/L3232P-620-100			32	32	170	54	32	25	100 to 200	88	**6.0**	**20**		1			
GNDFS R/L3232P-620-180			32	32	170	54	32	25	180 to 300	168	**6.0**	**20**	GC□ N60○○-□□	1	BX0620	**6.0**	LH050
GNDFS R/L3232P-620-280			32	32	170	54	32	25	280 to 1000	268	**6.0**	**20**		1			
GNDFS R/L3232P-620-450			32	32	170	54	32	25	450 up	438	**6.0**	**20**		1			
GNDFS R/L2525M-820-070			25	25	150	47	25	30	70 to 100	54	**8.0**	**20**		1			
GNDFS R/L2525M-820-100			25	25	150	47	25	30	100 to 200	84	**8.0**	**20**		1			
GNDFS R/L2525M-820-180			25	25	150	47	25	30	180 to 300	164	**8.0**	**20**	GCM N80○○-□□	1	BX0620	**6.0**	LH050
GNDFS R/L2525M-820-280			25	25	150	47	25	30	280 to 1000	264	**8.0**	**20**		1			
GNDFS R/L2525M-820-450			25	25	150	47	25	30	450 up	434	**8.0**	**20**		1			
GNDFS R/L3232P-820-070			32	32	170	54	32	30	70 to 100	54	**8.0**	**20**		1			
GNDFS R/L3232P-820-100			32	32	170	54	32	30	100 to 200	84	**8.0**	**20**		1			
GNDFS R/L3232P-820-180			32	32	170	54	32	30	180 to 300	164	**8.0**	**20**	GCM N80○○-□□	1	BX0620	**6.0**	LH050
GNDFS R/L3232P-820-280			32	32	170	54	32	30	280 to 1000	264	**8.0**	**20**		1			
GNDFS R/L3232P-820-450			32	32	170	54	32	30	450 up	434	**8.0**	**20**		1			

Select holders and inserts with matching width of cut (CW). Refer to F45 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

N·m Recommended Tightening Torque (N·m)

GNDFS type

Inserts for GNDFS type

(Coated Carbide / Cermet / Cemented Carbide)

Fig 1

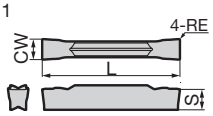


Fig 2

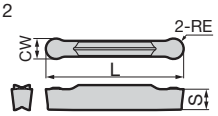
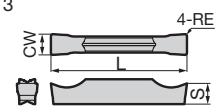


Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N6004-MG	●	●		●	●	●		●	—	**6.0**	±0.03	0.4	26.4	4.5	5	1
N6008-MG	●	●	●	●	●	●	●	●	—	**6.0**	±0.03	0.8	26.4	4.5		1
GCM N8004-MG	●	●		●	●	●		●	—	**8.0**	±0.04	0.4	28.8	6.0		1
N8008-MG	●	●	●	●	●	●	●	●	—	**8.0**	±0.04	0.8	28.8	6.0		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	**6.0**	±0.03	0.4	26.4	4.5	5	1
N6008-ML	●	●		●	●	●		●	—	**6.0**	±0.03	0.8	26.4	4.5		1
GCM N8004-ML	●	●	●	●	●	●	●	●	—	**8.0**	±0.04	0.4	28.8	6.0		1
N8008-ML	●	●		●	●	●		●	—	**8.0**	±0.04	0.8	28.8	6.0		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N6002-GG		●	●		●	●	●	●	—	**6.0**	±0.03	0.2	26.4	4.5	5	1
N6004-GG		●	●		●	●	●	●	—	**6.0**	±0.03	0.4	26.4	4.5		1
GCM N8004-GG		●	●		●	●	●	●	—	**8.0**	±0.04	0.4	28.8	6.0		1
GCM N6002-GL		●	●		●	●	●	●	—	**6.0**	±0.03	0.2	26.4	4.5	5	1
N6004-GL		●			●	●		●	—	**6.0**	±0.03	0.4	26.4	4.5		1
GCM N8004-GL		●	●		●	●	●	●	—	**8.0**	±0.04	0.4	28.8	6.0		1
GCM N6002-GF		●	●		●	●	●	●	—	**6.0**	±0.03	0.2	26.4	4.5	5	1
N6004-GF		●			●	●		●	—	**6.0**	±0.03	0.4	26.4	4.5		1
GCM N8002-GF		●	●		●	●	●	●	—	**8.0**	±0.04	0.2	28.8	6.0		1
N8004-GF		●	●		●	●	●	●	—	**8.0**	±0.04	0.4	28.8	6.0		1

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCM N6030-RN	●	●	●	●	●	●	●	●	**6.0**	±0.03	3.0	28.3	4.5	5	2

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
		Width of Cut	Tolerance	RE	L	S		
GCG N6004-GA	●	**6.0**	±0.025	0.4	26.4	4.5	5	3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDIS type

Internal Coolant

Internal Grooving
Clamp-on

SumiSmall

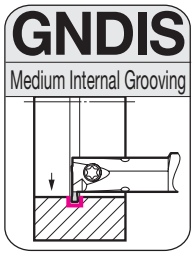


Fig 1

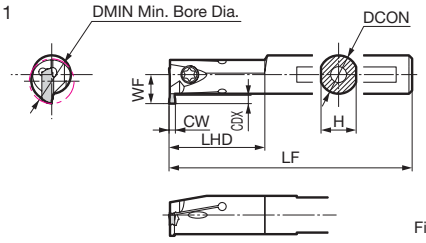


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Diameter DCON	Height H	Overall Length LF	Head LHD	Cutting Edge Distance WF	Min. Bore Dia. DMIN	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Flat Head Screw	N·m	Wrench
GNDIS R/L1214-T1526	●	●	12	11	150	30	9.0	14	**1.5**	**2.6**	GXM N150005S-GF	1	BFTX0409N	3.4	LT15
GNDIS R/L1214-T1536	●	●	12	11	150	30	10.0	14	**1.5**	**3.6**		1			
GNDIS R/L1616-T1536	●	●	16	15	160	35	11.5	16	**1.5**	**3.6**		1			
GNDIS R/L1620-T1546	●	●	16	15	160	40	14.5	20	**1.5**	**4.6**		1	BFTX0511N	5.0	LT20
GNDIS R/L2025-T1566	●	●	20	19	180	40	19.0	25	**1.5**	**6.6**		1			
GNDIS R/L1214-T2026	●	●	12	11	150	30	9.0	14	**2.0**	**2.6**	GXM N2002S-□□	1	BFTX0409N	3.4	LT15
GNDIS R/L1214-T2036	●	●	12	11	150	30	10.0	14	**2.0**	**3.6**		1			
GNDIS R/L1616-T2036	●	●	16	15	160	35	11.5	16	**2.0**	**3.6**		1			
GNDIS R/L1620-T2046	●	●	16	15	160	40	14.5	20	**2.0**	**4.6**		1	BFTX0511N	5.0	LT20
GNDIS R/L2025-T2066	●	●	20	19	180	40	19.0	25	**2.0**	**6.6**		1			
GNDIS R/L1214-T3026	●	●	12	11	150	30	9.0	14	**3.0**	**2.6**	GXM N3002S-□□	1	BFTX0409N	3.4	LT15
GNDIS R/L1214-T3036	●	●	12	11	150	30	10.0	14	**3.0**	**3.6**		1			
GNDIS R/L1616-T3036	●	●	16	15	160	35	11.5	16	**3.0**	**3.6**		1			
GNDIS R/L1620-T3046	●	●	16	15	160	40	14.5	20	**3.0**	**4.6**		1	BFTX0511N	5.0	LT20
GNDIS R/L2025-T3066	●	●	20	19	180	40	19.0	25	**3.0**	**6.6**		1			

Select holders and inserts with matching width of cut (CW). Only GXM inserts can be used. Refer to F47 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

Identification Code

GND IS R 12 14 - T 15 26

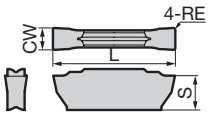
Series Code	Application Symbol: Internal Machining	Feed Direction	Shank Dia. (mm)	Min. Bore Dia. (mm)	For Internal Machining	Width of Cut x 10 (mm)	Maximum Groove Depth x 10 (mm)
GND	IS	R	12	14	T	15	26

N·m Recommended Tightening Torque (N·m)

Inserts for GNDIS type

(Coated Carbide)

Fig 1



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC520U	AC1030U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
			Width of Cut	Tolerance	RE	L	S		
GXM N2002S-ML	●	●	**2.0**	±0.03	0.2	11.1	3.1	5	1
N3002S-ML	●	●	**3.0**	±0.03	0.2	11.1	3.1		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC520U	AC1030U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
			Width of Cut	Tolerance	RE	L	S		
GXM N150005S-GF	—	●	**1.5**	±0.03	0.05	11.1	3.1	5	1
GXM N2002S-GF	●	●	**2.0**	±0.03	0.2	11.1	3.1		1
N3002S-GF	●	●	**3.0**	±0.03	0.2	11.1	3.1		1

Select holders and inserts with matching width of cut (CW). GCM/GCG inserts are not mutually compatible.

■ Recommended Cutting Conditions (GNDIS)

Work Material	P Carbon Steel / Alloy Steel		M Stainless Steel		K Cast Iron		S Exotic Alloy	
Insert Grade	AC520U	AC1030U	AC520U	AC1030U	AC520U	AC1030U	AC520U	AC1030U
Cutting Speed **vc** (m/min)	80-200	50-200	70-150	50-150	60-200	50-200	20-80	20-60

■ Grooving / Cut-off / Necking

Chipbreaker		Feed Rate f (mm/rev)	
		ML	GF
Width of Cut CW (mm)	**1.5**	–	0.02 to 0.10
	2.0	0.03 to 0.12	0.03 to 0.12
	3.0	0.05 to 0.15	0.05 to 0.15

■ Traverse Cutting

Chipbreaker		ML	
		Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Width of Cut CW (mm)	**2.0**	0.03 to 0.12	0.2 to 0.8
	3.0	0.05 to 0.15	0.3 to 1.2

Precautions for Use F22

GNDI type

Internal Coolant

Internal Grooving
Clamp-on

Fig 1

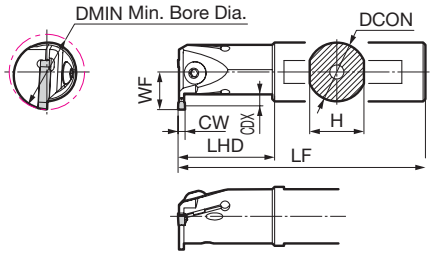


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Diameter DCON	Height H	Head LHD	Overall Length LF	Cutting Edge Distance WF	Min. Bore Dia. DMIN	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Bolt	Bolt N·m	Wrench
GNDI R/L2532-T206	●	●	25	23	40	200	16	32	**2.0**	**6**	GC□ N20○○-□□	1	BH0516	**5.0**	LH030
GNDI R/L3240-T210	●	●	32	30	50	250	26	40	**2.0**	**10**		1	BH0616	**6.0**	LH040
GNDI R/L2532-T306	●	●	25	23	40	200	16	32	**3.0**	**6**	GC□ N30○○-□□	1	BH0516	**5.0**	LH030
GNDI R/L3240-T310	●	●	32	30	50	250	26	40	**3.0**	**10**		1	BH0616	**6.0**	LH040
GNDI R/L4050-T311	●	●	40	38	60	300	31	50	**3.0**	**11**		1			
GNDI R/L2532-T406	●	●	25	23	40	200	19	32	**4.0**	**6**	GC□ N40○○-□□	1	BH0516	**5.0**	LH030
GNDI R/L3240-T410	●	●	32	30	50	250	26	40	**4.0**	**10**		1	BH0616	**6.0**	LH040
GNDI R/L4050-T411	●	●	40	38	60	300	31	50	**4.0**	**11**		1			
GNDI R/L2532-T506	●	●	25	23	40	200	19	32	**5.0**	**6**	GC□ N50○○-□□	1	BH0516	**5.0**	LH030
GNDI R/L3240-T510	●	●	32	30	50	250	26	40	**5.0**	**10**		1	BH0616	**6.0**	LH040
GNDI R/L4050-T511	●	●	40	38	60	300	31	50	**5.0**	**11**		1			
GNDI R/L4050-T611	●	●	40	38	60	300	31	50	**6.0**	**11**	GC□ N60○○-□□	1	BH0616	**6.0**	LH040

Select holders and inserts with matching width of cut (CW). Refer to F49 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

N·m Recommended Tightening Torque (N·m)

GNDI type

Inserts for GNDI type

(Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

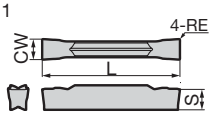


Fig 2

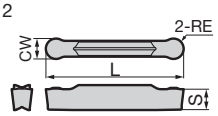
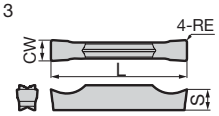


Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0	5	1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0	5	1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●	2.0	±0.03	1.0	21.7	3.6		2
N3015-RN	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	22.6	3.8		2
N4020-RN	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	28.2	4.0	5	2
N5025-RN	●	●	●	●	●	●	●	●	5.0	±0.03	2.5	28.3	4.1		2
N6030-RN	●	●	●	●	●	●	●	●	6.0	±0.03	3.0	28.3	4.5		2

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6		3
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		3
GCG N4004-GA	●								4.0	±0.025	0.4	26.4	4.0	5	3
N5004-GA	●								5.0	±0.025	0.4	26.4	4.1		3
N6004-GA	●								6.0	±0.025	0.4	26.4	4.5		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDCM type

External

SumiPolygon Cassette for External Grooving
Clamp-on

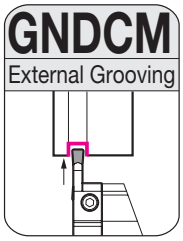


Fig 1

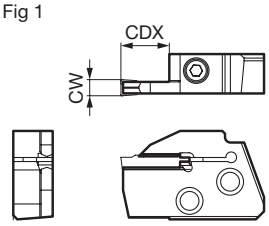


Figure shows right-handed (R) tool.

SumiPolygon GND series Cassette

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Applicable Holder	Fig	Cap Screw	N·m	Wrench
GNDCM R/L 212	●	●	2	12	GC□□20○○-□□		1			
GNDCM R/L 312	●	●	3	12	GC□□30○○-□□	PSC○○GND○○○○00 R/L	1			
GNDCM R/L 418	●	●	4	18	GC□□40○○-□□		1	BX0512	5.0	LH040
GNDCM R/L 518	●	●	5	18	GC□N50○○-□□	PSC○○GND○○○○90 R/L	1			
GNDCM R/L 618	●	●	6	18	GC□N60○○-□□		1			

Select holders and inserts with matching width of cut (CW). Refer to F51 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

Identification Code Cassette

GNDCM R 2 12

- GNDCM: Series Code
- R: Feed Direction
- 2: Width of Cut (mm)
- 12: Maximum Groove Depth (mm)

Fig 1

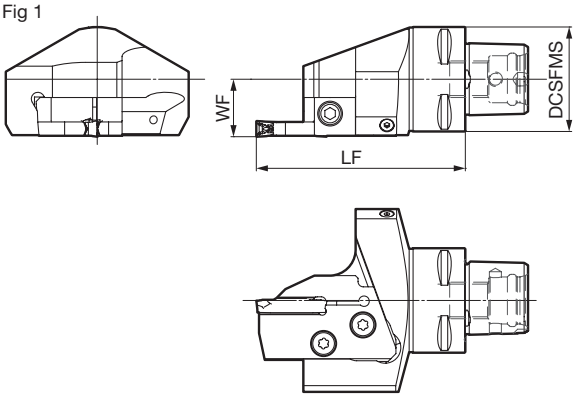


Figure shows right-handed (R) tool.

Fig 1

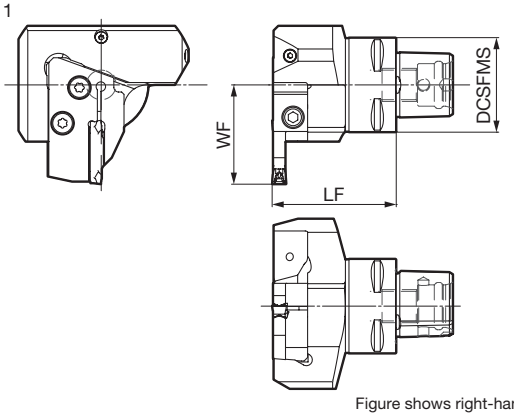


Figure shows right-handed (R) tool.

SumiPolygon GND series Tool Holder (Straight)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCS-FMS	Applicable Cassettes	Fig	Flat Head Screw	N·m	Wrench
PSC40 GND 228000 R/L	●	●	22	80	40	GNDCM R/LOOO	1	BFTX0619N	7.5	TT25
PSC50 GND 278000 R/L	●	●	27	80	50		1			
PSC63 GND 338000 R/L	●	●	33	80	63		1			

Inserts and cassettes are not included with the holders.

SumiPolygon GND series Tool Holder (L type)

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCS-FMS	Applicable Cassettes	Fig	Flat Head Screw	N·m	Wrench
PSC40 GND 425290 R/L	●	●	42	52.5	40	GNDCM L/ROOO	1	BFTX0619N	7.5	TT25
PSC50 GND 475590 R/L	●	●	47	55	50		1			
PSC63 GND 545790 R/L	●	●	54	57	63		1			

Inserts and cassettes are not included with the holders.

Identification Code Holder

PSC40 GND 42 52 90 R

- PSC40: SumiPolygon Shank Size
- GND: Series Code: GND series
- 42: WF Dimension (mm)
- 52: LF Dimension (mm)
- 90: 00: Straight, 90: L type
- R: Feed Direction

N·m Recommended Tightening Torque (N·m)

GNDCM type

Inserts for GNDCM type

(Coated Carbide / Cermet / Cemented Carbide)

Fig 1

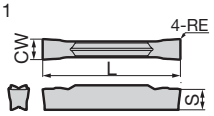


Fig 2 (Figure shows right-handed (R) tool.)

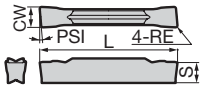


Fig 3

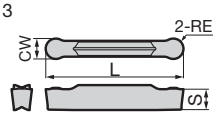
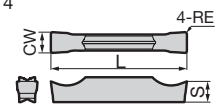


Fig 4



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0	5	1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N2002-ML	—	—	—	—	●	●	●	●	●	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0	5	1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2		1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8	5	2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8	5	2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

External Profiling / External Radius Grooving

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3015-RG	●	●	●	●	●	●	●	●	●	3.0	±0.03	1.5	21.1	3.8		3
N4020-RG	●	●	●	●	●	●	●	●	●	4.0	±0.03	2.0	26.4	4.0	5	3
GCM N5025-RG	●	●	●	●	●	●	●	●	—	5.0	±0.03	2.5	27.2	4.1		3
N6030-RG	●	●	●	●	●	●	●	●	—	6.0	±0.03	3.0	27.5	4.5		3

Profiling / Radius Grooving / Necking

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U		Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2010-RN	—	—	—	—	●	●	●	●		2.0	±0.03	1.0	21.7	3.6		3
N3015-RN	●	●	●	●	●	●	●	●		3.0	±0.03	1.5	22.6	3.8		3
N4020-RN	●	●	●	●	●	●	●	●		4.0	±0.03	2.0	28.2	4.0	5	3
N5025-RN	●	●	●	●	●	●	●	●		5.0	±0.03	2.5	28.3	4.1		3
N6030-RN	●	●	●	●	●	●	●	●		6.0	±0.03	3.0	28.3	4.5		3

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10									Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●									2.0	±0.025	0.2	21.1	3.6		4
N3002-GA	●									3.0	±0.025	0.2	21.1	3.8		4
GCG N4004-GA	●									4.0	±0.025	0.4	26.4	4.0	5	4
N5004-GA	●									5.0	±0.025	0.4	26.4	4.1		4
N6004-GA	●									6.0	±0.025	0.4	26.4	4.5		4

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
External Profiling / External Radius Grooving	RG	Profiling / General-purpose
Profiling / Radius Grooving / Necking	RN	Facing / Necking / General-purpose
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

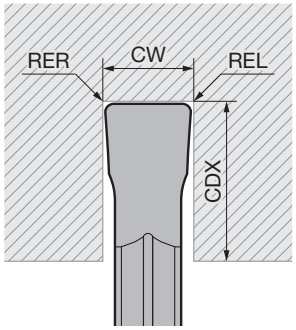
Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

SEC-Grooving Tool GND series Special Grooving Insert Request Form

Applicable Tool Holders (Width of Cut 2 to 6mm)
External Turning: GNDS type (→F28), GNDM type (→F24, F26, F30, F32), GNDMS type (→F30), GNDL type (→F24, F26, F34, F36), GNDLS type (→F34), GNDCM type (→F50) *GNDXL Types cannot be used as the insert shape is different
Internal Boring: GNDI type (→F48) *GNDIS types cannot be used as the insert shape is different
Facing: GNDF type (→F42), GNDFS type (→F44)

Special inserts with ground chipbreaker (customised width of cut and insert corner radius) can be made-to-order. To order, fill out the form below (indicate preference by circling the item or specify dimensions), and send it to a Sumitomo Electric Hardmetal dealer or distributor. (Make a copy of this form.)
For grooving inserts with shape, width of cut or grade other than those listed below, contact your nearest Sumitomo Electric Hardmetal sales office (refer to the back of this catalog).

Your Company / Contact Information (Phone / Fax / Address, etc.)

Shape	Item	Description
	Width of Cut **CW** (2.00 to 6.59mm)	mm
	Corner Radius **RER**	mm
	Corner Radius **REL**	mm
	Grade (Select from right)*1	AC530U / AC520U / EH520 / H10 / KH03 CBN Grade / PCD Grade
	Grooving Depth **CDX** *2	mm

*1: If H10 is selected as the grade, the cutting edge will have a sharp edge.
*2: Set the chipbreaker width based on CDX. The actual groove depth can only be less than or equal to the maximum groove depth configurable by each holder.

Form instructions

1. The applicable standard holder depends on the width of cut. Refer to the chart on the right for manufacturable widths of cut and corner radius range for facing. (If using a corner radius exceeding this for facing, modification is required to prevent the holder from interfering with the work material.)
2. The corner radius maximum value for external turning and internal boring is 1/2 the width of cut.
3. Width of cut (CW) tolerance is ±0.025mm when manufactured.
4. WF dimensions for each holder are the CWS value for the applicable holder standard insert width of cut as follows.
   (Standard holder dimension WF) + (WF - CWS) / 2
5. For inch widths of cut, inserts can also be supplied partially unground. Contact your local sales office for details.

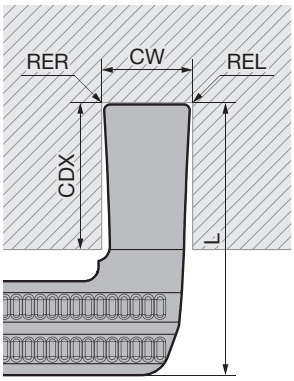
Width of Cut CW (Nominal Value)	Applicable Standard Holder	Corner radius (RER, REL) maximum value when used for facing (standard holder applicable)
2.00 to 2.59mm	2mm Width Holder	0.2mm
2.60 to 3.59mm	3mm Width Holder	0.4mm
3.60 to 4.59mm	4mm Width Holder	0.8mm
4.60 to 5.59mm	5mm Width Holder	
5.60 to 6.59mm	6mm Width Holder	

SEC-Grooving Tool GND series 90° Insert Request Form

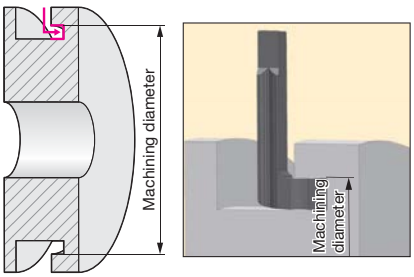
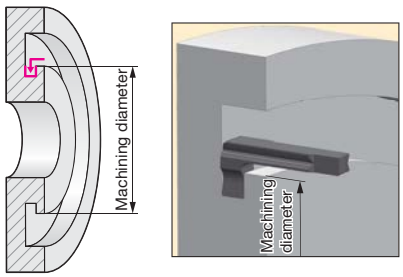
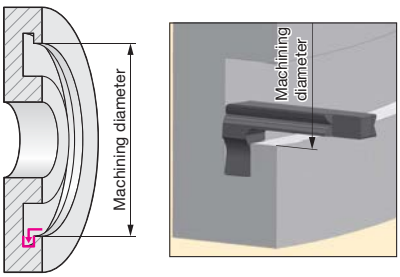
Applicable holders: Inquire along with inserts.

To order, fill out the form below (indicate your preference by circling the item or specify dimensions), and send it to a Sumitomo Electric Hardmetal dealer or distributor. (Make a copy of this form.)
For grooving inserts with shape, width of cut or grade other than those listed below, contact your nearest Sumitomo Electric Hardmetal sales office (refer to the back of this catalog).

Your Company / Contact Information (Phone / Fax / Address, etc.)

Shape	Item	Description
	Width of Cut **CW** (2.00 to 6.00mm)	mm
	Corner Radius **RER**	mm
	Corner Radius **REL**	mm
	Grade (Select from right)	EH510 / EH520 / AC5015S / AC5025S
	Grooving Depth **CDX**	mm
	Cutting Edge Position **L**(5.80mm up) (Enter the maximum allowable value)	mm
	Feed Direction	Right-handed / Left-handed
	Insert Thickness (Select from right)	Standard / High rigidity

Workpiece machining part and machining method
(Select one of the options below and enter the machining diameter)

Facing	External Machining	Internal Machining
		
Machining Dia.: mm	Machining Dia.: mm	Machining Dia.: mm

SGE series

External

Clamp-on for
External Shallow Grooves

SGE
External Grooving

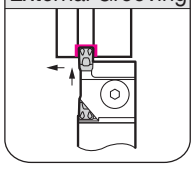
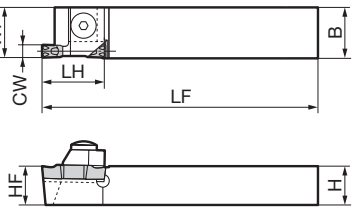


Fig 1



Effective Machining Depth

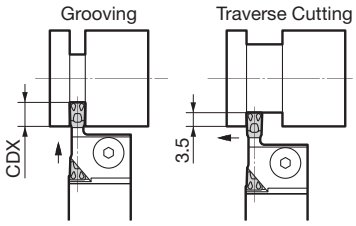


Figure shows right-handed (R) tool.

SumiSmall

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Maximum Groove Depth CDX	Applicable Insert	Fig	Clamp Plate	Bolt	Spring	Wrench
SGE R/L1016-3	●	●	10	16	120	15.7	10	19.5	**3.0**	**6.2**	GEN30○○	1	GCL R/L-3	FBH 0516NT	GSP-5	LH025NT
SGE R/L1216-3	●	●	12	16	120	15.7	12	19.5	**3.0**	**6.2**		1				
SGE R/L1616-3	●	●	16	16	120	15.7	16	22.0	**3.0**	**8.0**		1		FBH 0520NT		
SGE R/L2020-3	●	●	20	20	120	19.7	20	22.0	**3.0**	**8.0**		1				
SGE R/L1016-45	●	●	10	16	120	15.7*	10	19.5		**6.2**	GEN40○○ GEN50○○	1	GCL R/L-4	FBH 0516NT	GSP-5	LH025NT
SGE R/L1216-45	●	●	12	16	120	15.7*	12	19.5	**4.0**	**6.2**		1				
SGE R/L1616-45	●	●	16	16	120	15.7*	16	22.0	**5.0**	**8.0**		1		FBH 0520NT		
SGE R/L2020-45	●	●	20	20	120	19.7*	20	22.0		**8.0**		1				
SGE R/L1020-6	●	●	10	20	120	19.7	10	19.5	**6.0**	**6.2**	GEN60○○	1	GCL R/L-6	FBH 0516NT	GSP-5	LH025NT
SGE R/L1220-6	●	●	12	20	120	19.7	12	19.5	**6.0**	**6.2**		1				
SGE R/L1620-6	●	●	16	20	120	19.7	16	22.0	**6.0**	**8.0**		1		FBH 0520NT		
SGE R/L2020-6	●	●	20	20	120	19.7	20	22.0	**6.0**	**8.0**		1				

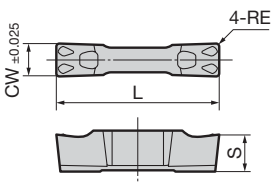
*Width of cut CW = 4mm when the insert is mounted. Width of cut CW is 0.5mm larger when a 5mm insert is mounted.

Insert (Coated Carbide)

Dimensions (mm)

Cat. No.	ACZ150	Width of Cut CW	Overall Length L	Thickness S	Corner Radius RE	Applicable Holder	Fig
GEN 3002	●	**3.0**	20	4.64	0.2	SGE R/L ○○○○-3	1
GEN 3004	●	**3.0**	20	4.64	0.4		1
GEN 4002	●	**4.0**	20	4.50	0.2	SGE R/L ○○○○-45	1
GEN 4004	●	**4.0**	20	4.50	0.4		1
GEN 5002	●	**5.0**	20	4.50	0.2	SGE R/L ○○○○-45	1
GEN 5004	●	**5.0**	20	4.50	0.4		1
GEN 6002	●	**6.0**	20	4.50	0.2	SGE R/L ○○○○-6	1
GEN 6004	●	**6.0**	20	4.50	0.4		1

Fig 1



Recommended Cutting Conditions A24

CKB series

Facing

Clamp-on for Very Small Diameter Face Grooving

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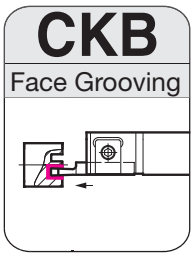
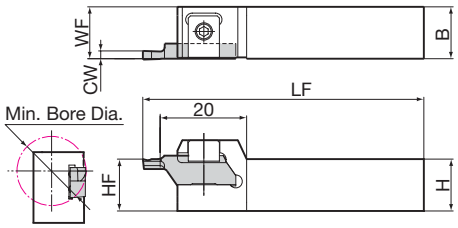


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Clamp Plate	Double Screw	Wrench
CKBR 1010-16	●	10	10	111	10	10	1	CKBW16	WB4-8	LH020
CKBR 1212-16	●	12	12	136	12	12	1			
CKBR 1616-16	●	16	16	136	16	16	1			
CKBR 2020-16	●	20	20	136	20	20	1			
CKBR 2525-16		25	25	161	25	25	1			

*For round shank holders, refer to page E58.

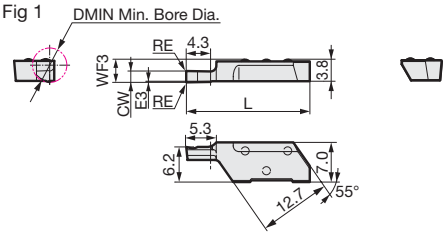
Round Shank Holders E66

Insert (Coated Carbide)

Dimensions (mm)

Cat. No.	ACZ150	Min. Bore Dia. DMIN	Cutting Edge Distance WF3	Cutting Edge Distance E3	Width of Cut CW	Corner Radius RE	Overall Length L	Maximum Groove Depth CDX	Fig
KBMF R0615-05	●	6.0	4.0	0.2	**1.5**	0.05	21.8	**4.0**	1
KBMF R0620-05	●	6.0	4.0	0.2	**2.0**	0.05	21.8	**4.0**	1
KBMF R0630-05	●	6.0	4.0	0.2	**3.0**	0.05	21.8	**4.0**	1

Fig 1



Recommended Cutting Conditions A24

CKB series

Internal

Internal Grooving
Clamp-on

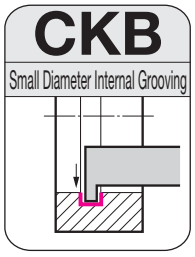
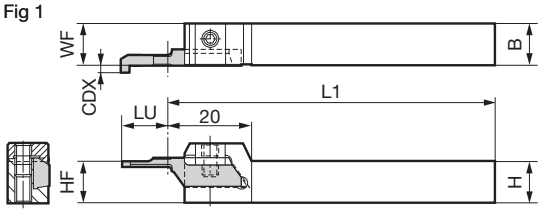


Fig 1



Refer to the insert table for CDX and LU values.

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Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length L1	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Clamp Plate	Double Screw	Wrench
CKB R1010-16	●	10	10	100	10	10	1	CKBW16	WB4-8	LH020
CKB R1212-16	●	12	12	125	12	12	1			
CKB R1616-16	●	16	16	125	16	16	1			
CKB R2020-16	●	20	20	125	20	20	1			
CKB R2525-16		25	25	150	25	25	1			

Refer to the insert table for CDX and LU values.

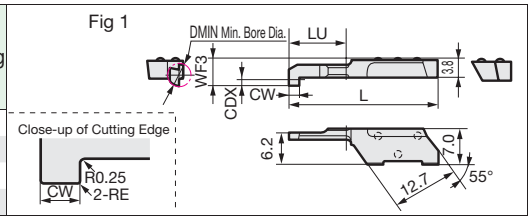
Round Shank Holders E66

Insert (Coated Carbide)

Dimensions (mm)

Cat. No.	AC1030U	Min. Bore Dia. DMIN	Width of Cut CW	Cutting Edge Distance WF3	Corner Radius RE	Overall Length L	Maximum Groove Depth CDX	Machinable Length LU	Fig
KBMG R0411-05	●	4.0	**1.00**	4.90	0.05	28.5	1.1	**11**	1
KBMG R0411-10	●	4.0	**2.00**	4.90	0.10	28.5	1.1	**11**	1
KBMG R0511-05	●	5.0	**1.00**	5.10	0.05	28.5	1.3	**11**	1
KBMG R0511-10	●	5.0	**2.00**	5.10	0.10	28.5	1.3	**11**	1

Fig 1



Recommended Cutting Conditions A24

SGIT series

Internal

Internal Grooving
Screw-on

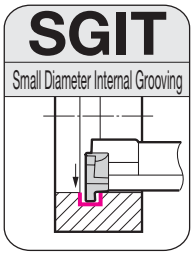
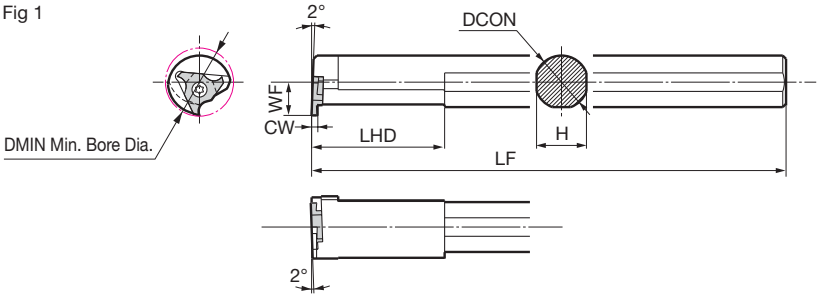


Fig 1



SumiSmall

Holder

Parts Dimensions (mm)

Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Min. Bore Dia. DMIN	Width of Cut CW	Maximum Groove Depth	Applicable Insert	Fig	Flat Head Screw	Wrench
													RT08 / RT10
SGIT R08	●	8	7.0	125	5.0	20	10.0	**0.50 to 2.00**	**0.8***	GITL3○○○	1	BFTX02506NS	RT08
SGIT R10	●	10	9.0	150	6.0	25	12.0	**0.50 to 2.00**	**0.8***		1		
SGIT R12	●	12	11.0	180	7.0	30	14.0	**1.00 to 2.00**	**1.8**	GITL5○○○	1	BFTX0307NS	RT10
SGIT R14	●	14	13.0	180	8.0	35	16.0	**1.00 to 2.00**	**1.8**		1		
SGIT R16	●	16	15.0	200	10.0	40	20.0	**1.50 to 2.00**	**2.8**	GITL6○○○	1	BFTX0307NS	RT10
SGIT R20	●	20	19.0	200	12.0	40	25.0	**1.50 to 2.00**	**2.8**		1		

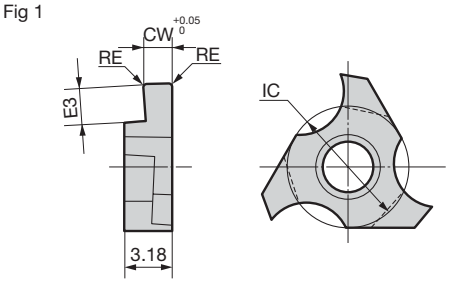
* The maximum groove depth is 0.5mm when GITL3050 is set. (Width of cut CW = 0.5mm)

Insert (Coated Carbide)

Dimensions (mm)

Cat. No.	ACZ150	Width of Cut CW	Cutting Edge Distance E3	Corner Radius RE	Inscribed Circle IC	Applicable Holder	Fig
GIT L3050	●	**0.50**	1.2	0.05	5.56	SGIT R08 SGIT R10	1
GIT L3065	●	**0.65**	1.2	0.05	5.56		1
GIT L3075	●	**0.75**	1.2	0.05	5.56		1
GIT L3100	●	**1.00**	1.2	0.05	5.56		1
GIT L3125	●	**1.25**	1.2	0.20	5.56		1
GIT L3145	●	**1.45**	1.2	0.20	5.56		1
GIT L3150	●	**1.50**	1.2	0.05	5.56		1
GIT L3200	●	**2.00**	1.2	0.10	5.56		1
GIT L5100	●	**1.00**	2.2	0.05	7.94	SGIT R12 SGIT R14	1
GIT L5145	●	**1.45**	2.2	0.20	7.94		1
GIT L5150	●	**1.50**	2.2	0.05	7.94		1
GIT L5175	●	**1.75**	2.2	0.20	7.94		1
GIT L5200	●	**2.00**	2.2	0.10	7.94		1
GIT L6150	●	**1.50**	3.2	0.20	9.525	SGIT R16 SGIT R20	1
GIT L6175	●	**1.75**	3.2	0.20	9.525		1
GIT L6200	●	**2.00**	3.2	0.20	9.525		1

Fig 1



Recommended Cutting Conditions A24

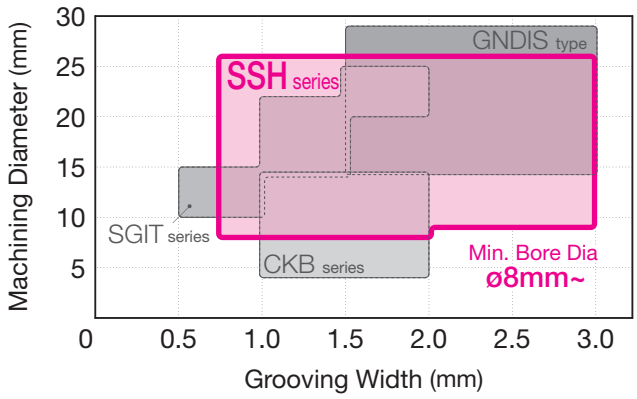
SSH series

VIDEO OF CUTTING

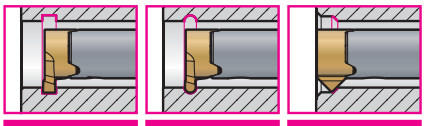
Features

- Internal coolant supply for outstanding chip evacuation
- Tough carbide body for stable turning even with small diameters, suppressing chatter
- Adopts AC1030U for excellent machined surface quality
- Min. bore diameter from ø8mm
- Wide range of grooving widths
  In addition to grooving applications, we have a lineup for circlip groove machining
- Expanded 09/10 sized inserts support grooving depths of 2mm (min. bore dia. 9mm) and 3mm (min. bore dia. 10mm)

Application Range



Insert Lineup



SSHG type　SSHR type　SSHC type

Product Range

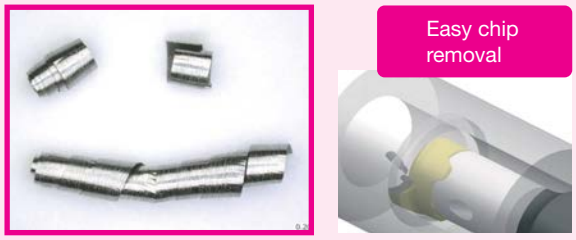
Grooving / Radius Shape　Grooving / C-Chamfering　Radius Grooving/Profiling　Chamfering

Applications	Insert Type	Insert Size	Min. Bore Dia. (mm)	Max. Groove Depth (mm)	Width of Cut / Cutting Edge Corner Shape (mm) 0.74	0.80	0.84	0.94	1.00	1.19	1.20	1.39	1.50	1.69	1.80	2.00	2.20	2.50	3.00	Chamfering	Applicable Holder
Grooving	SSHG	08	8	1.0	C0.05		C0.05	C0.05	C0.05 R0.1	C0.05		C0.05	C0.05 R0.1	C0.05		C0.05 R0.1 R0.2					EOOD-SSHMNOOO-08
		New 09	9	2.0					R0.1				R0.1			R0.1 R0.2		R0.1 R0.2	R0.1 R0.2		
		New 10	10	3.0					R0.1				R0.1			R0.1 R0.2		R0.1 R0.2	R0.1 R0.2		
		14	14	1.2	C0.05																EOOD-SSHMNOOO-14
				1.3			C0.05														
				1.5				C0.05													
				1.6					C0.05 R0.1												
				4.0						C0.05		C0.05	C0.05 R0.1	C0.05		C0.05 R0.1 R0.2		C0.05 R0.1 R0.2	C0.05 R0.1 R0.2		
Radius Grooving/ Profiling	SSHR	08	8	1.0		R0.4			R0.5		R0.6		R0.75		R0.9	R1.0					EOOD-SSHMNOOO-08
		14	14	1.6					R0.5												EOOD-SSHMNOOO-14
				4.0							R0.6		R0.75		R0.9	R1.0	R1.1	R1.25	R1.5		
Chamfering	SSHC	08	8	1.4																C	EOOD-SSHMNOOO-08

09/10 sized inserts are only right-handed.

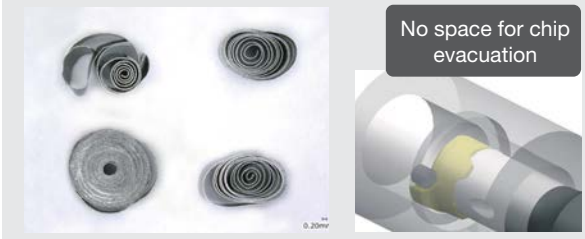
■ Chip Evacuation

Stable and smooth evacuation of curled chips even in small bore diameters



SSH series

Evacuation is poor, may cause sudden tool fracture

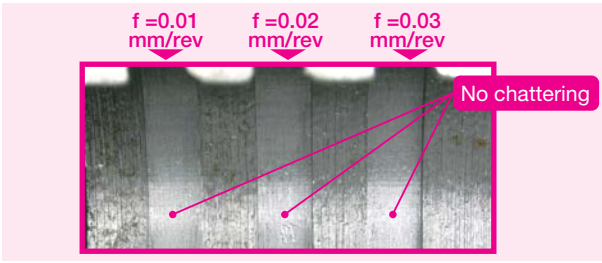


Competitor's Product A

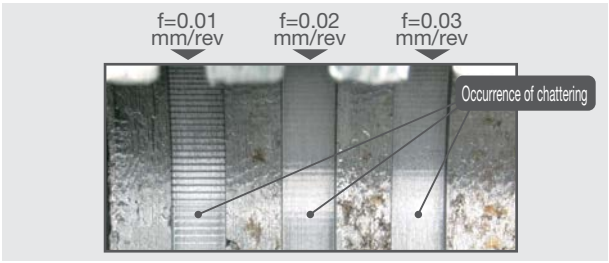
Work Material: S45C Machining Diameter: ø13mm Cutting Conditions: vc = 50m/min, f = 0.02mm/rev, ap = 1.0mm Wet (Oil-based)

■ Chatter Resistance

Outstanding sharpness and carbide shank suppress chatter



SSH series

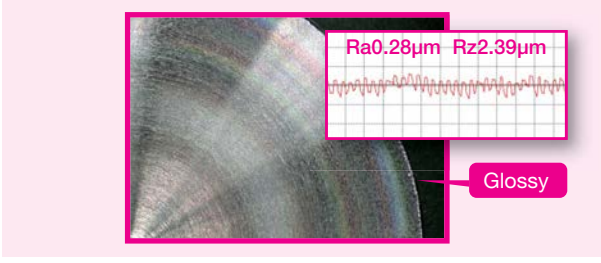


Competitor's Product B

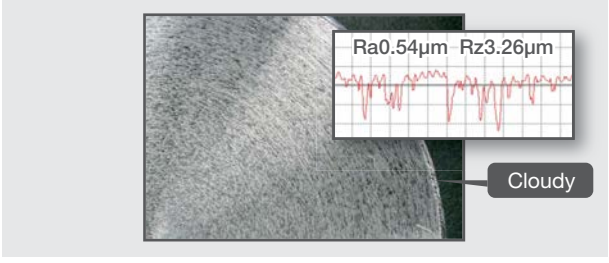
Work Material: S45C Machining Diameter: ø13mm Cutting Conditions: vc = 100m/min, f = 0.01, 0.02, 0.03mm/rev, ap = 0.2mm Wet (Oil-based)

■ Machined Surface Quality

Glossy, beautiful surface finish



SSH series



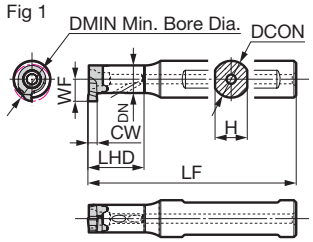
Competitor's Product C

Work Material: SCM440 Machining Diameter: ø30mm Cutting Conditions: vc = 180m/min, f = 0.02mm/rev, ap = 0.2mm Wet (Oil-based)

SSH series

Internal

Fig 1



SumiSmall

Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Shank Diameter DCON	Neck Dia. DN	Width H	Overal Length LF	Head Length LHD	Min. Bore Dia. DMIN	Width of Cut CW	Applicable Insert	Fig	Flat Head Screw	N·m	Wrench
E08D-SSHM N125-08	●	8	6	7	60(60.4)	12.5(12.9)	8~	**0.74** to **3.00**	SSH☐ R/L **08**···	1	BFTX02608IPS	**1.2**	TRX08IP
E08E-SSHM N210-08	●	8	6	7	70(70.4)	21.0(21.4)	8~	**0.74** to **3.00**	SSH☐ R/L **08**···	1	BFTX02608IPS	**1.2**	TRX08IP
E12E-SSHM N125-08	●	12	6	11	70(70.4)	12.5(12.9)	8~	**0.74** to **3.00**	SSH☐ R **09**···	1	BFTX02608IPS	**1.2**	TRX08IP
E12F-SSHM N210-08	●	12	6	11	80(80.4)	21.0(21.4)	8~	**0.74** to **3.00**	SSH☐ R **09**···	1	BFTX02608IPS	**1.2**	TRX08IP
E12G-SSHM N300-08	●	12	6	11	90(90.4)	30.0(30.4)	8~	**0.74** to **3.00**	SSH☐ R **10**···	1	BFTX02608IPS	**1.2**	TRX08IP
E12H-SSHM N420-08	●	12	6	11	100(100.4)	42.0(42.4)	8~	**0.74** to **3.00**	SSH☐ R **10**···	1	BFTX02608IPS	**1.2**	TRX08IP

Overall Length LF and Head Length LHD are dimensions with SSHG Type / SSHR Type inserts mounted. Parentheses show dimensions with SSHG R 09 ··· Type (09 size) / SSHG R 10 ··· Type (10 size) mounted. Min. Bore Dia. DMIN above is the dimension when 08 sized inserts are mounted, it is 9mm with 09 sized inserts and 10mm with 10 sized inserts.

Refer to the Insert Stock Table on page F61 for cutting edge distance WF dimensions.

Identification Code

E 08 D - SSHM N 125 - 08

E	08	D	-	SSHM	N	125	-	08
Shank Material Code	Shank Dia (mm)	Shank Length Code		Series Code	Feed Direction	Head Length Reference (mm) x 10		Min. Bore Dia. (mm) * With sized 08 insert mounted

N·m Recommended Tightening Torque (N·m)

SSH series

Expansion

Insert (For E08□-SSHMN○○○-08 / E12□-SSHMN○○○-08) (Coated Carbide)

Dimensions (mm)

Applications	Cat. No.	AC1030U R	AC1030U L	Width of Cut CW	Maximum Groove Depth CDX	Corner Radius RE	Cutting Edge Distance WF3	Cutting Edge Distance WF	Thickness S	Cutting Edge Distance E2	Applicable Holder	Fig
Grooving (08 size)	**SSHG R/L 0807400**	●	●	**0.74**	**1.0**	—	3.2	4.80	3.6	0.4		1
	R/L 0808400	●	●	**0.84**	**1.0**	—	3.2	4.80	3.6	0.4		1
	R/L 0809400	●	●	**0.94**	**1.0**	—	3.2	4.80	3.6	0.4		1
	R/L 0810000	●	●	**1.00**	**1.0**	—	3.2	4.80	3.1	—		1
	R/L 0810010	●	●	**1.00**	**1.0**	0.10	3.2	4.80	3.1	—		2
	R/L 0811900	●	●	**1.19**	**1.0**	—	3.2	4.80	3.1	—		1
	R/L 0813900	●	●	**1.39**	**1.0**	—	3.2	4.80	3.0	—		1
	R/L 0815000	●	●	**1.50**	**1.0**	—	3.2	4.80	3.0	—		1
	R/L 0815010	●	●	**1.50**	**1.0**	0.10	3.2	4.80	3.0	—		2
	R/L 0816900	●	●	**1.69**	**1.0**	—	3.2	4.80	3.0	—		1
	R/L 0820000	●	●	**2.00**	**1.0**	—	3.2	4.80	3.0	—		1
	R/L 0820010	●	●	**2.00**	**1.0**	0.10	3.2	4.80	3.0	—		2
	R/L 0820020	●	●	**2.00**	**1.0**	0.20	3.2	4.80	3.0	—		2
Grooving (09 size)	**SSHG R 0910010** New	●	—	**1.00**	**2.0**	0.10	3.6	5.50	3.5	—		2
	R 0915010 New	●	—	**1.50**	**2.0**	0.10	3.6	5.50	3.4	—		2
	R 0920010 New	●	—	**2.00**	**2.0**	0.10	3.6	5.50	3.4	—		2
	R 0920020 New	●	—	**2.00**	**2.0**	0.20	3.6	5.50	3.4	—		2
	R 0925010 New	●	—	**2.50**	**2.0**	0.10	3.6	5.50	3.4	—	E08□-SSHMN○○○-**08**	2
	R 0925020 New	●	—	**2.50**	**2.0**	0.20	3.6	5.50	3.4	—	E12□-SSHMN○○○-**08**	2
	R 0930010 New	●	—	**3.00**	**2.0**	0.10	3.6	5.50	3.4	—		2
	R 0930020 New	●	—	**3.00**	**2.0**	0.20	3.6	5.50	3.4	—		2
Grooving (10 size)	**SSHG R 1010010** New	●	—	**1.00**	**3.0**	0.10	3.6	6.50	3.5	—		2
	R 1015010 New	●	—	**1.50**	**3.0**	0.10	3.6	6.50	3.4	—		2
	R 1020010 New	●	—	**2.00**	**3.0**	0.10	3.6	6.50	3.4	—		2
	R 1020020 New	●	—	**2.00**	**3.0**	0.20	3.6	6.50	3.4	—		2
	R 1025010 New	●	—	**2.50**	**3.0**	0.10	3.6	6.50	3.4	—		2
	R 1025020 New	●	—	**2.50**	**3.0**	0.20	3.6	6.50	3.4	—		2
	R 1030010 New	●	—	**3.00**	**3.0**	0.10	3.6	6.50	3.4	—		2
	R 1030020 New	●	—	**3.00**	**3.0**	0.20	3.6	6.50	3.4	—		2
Radius Grooving/ Profiling	**SSHR R/L 08080**	●	●	**0.80**	**1.0**	0.40	3.2	4.80	3.1	—		3
	R/L 08100	●	●	**1.00**	**1.0**	0.50	3.2	4.80	3.1	—		3
	R/L 08120	●	●	**1.20**	**1.0**	0.60	3.2	4.80	3.1	—		3
	R/L 08150	●	●	**1.50**	**1.0**	0.75	3.2	4.80	3.0	—		3
	R/L 08180	●	●	**1.80**	**1.0**	0.90	3.2	4.80	3.0	—		3
	R/L 08200	●	●	**2.00**	**1.0**	1.00	3.2	4.80	3.0	—		3
Chamfering	**SSHC R/L 08454502**	●	●	—	**1.4**	0.20	1.8	4.65	3.6	—		4

Fig 1 (Grooving)

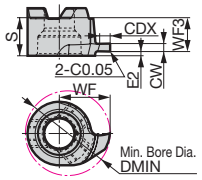


Fig 2 (Grooving)

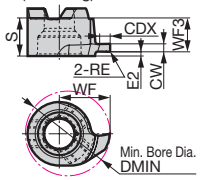


Fig 3 (Radius Grooving/Profiling)

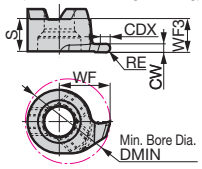


Fig 4 (Chamfering)

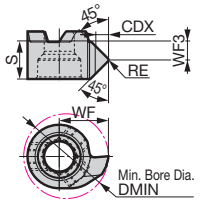


Figure shows right-handed (R) tool.

Min. Bore Dia. DMIN dimension for 08 size: 8mm, 09 size: 9mm, 10 size: 10mm.

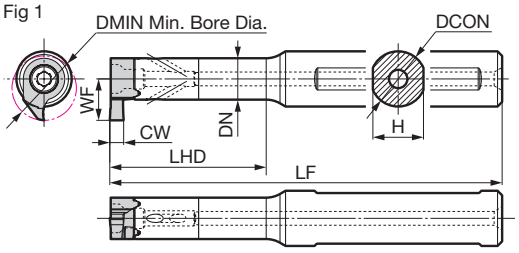
■ Recommended Cutting Conditions

Work Material	P Carbon Steel / Alloy Steel	M Stainless Steel	K Cast Iron
Cutting Speed vc (m/min)	20-200	15-80	20-160
Feed Rate f (mm/rev)	0.01-0.03	0.01-0.03	0.01-0.03

SSH series

Internal

Fig 1



SumiSmall

Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Shank Diameter DCON	Neck Dia. DN	Width H	Overall Length LF	Head Length LHD	Min. Bore Dia. DMIN	Width of Cut CW	Applicable Insert	Fig	Flat Head Screw	N·m	Wrench
E12X-SSHM N195-14	●	12	9	11	75	19.5	14	**0.74** to **3.00**	SSH□ R/L **14**···	1	BFTX0412IPS	**5.0**	LT15IP
E12H-SSHM N340-14	●	12	9	11	100	34.0	14	**0.74** to **3.00**		1			
E12J-SSHM N450-14	●	12	9	11	110	45.0	14	**0.74** to **3.00**		1			
E12X-SSHM N640-14	●	12	9	11	130	64.0	14	**0.74** to **3.00**		1			
E16F-SSHM N195-14	●	16	9	14	80	19.5	14	**0.74** to **3.00**		1	BFTX0412IPS	**5.0**	LT15IP
E16H-SSHM N340-14	●	16	9	14	100	34.0	14	**0.74** to **3.00**		1			
E16J-SSHM N450-14	●	16	9	14	110	45.0	14	**0.74** to **3.00**		1			
E16X-SSHM N640-14	●	16	9	14	130	64.0	14	**0.74** to **3.00**		1			

Refer to the Insert Stock Table on page F63 for cutting edge distance WF dimensions.

Identification Code

E 12 X - SSHM N 195 - 14

Shank Material Code	Shank Dia (mm)	Shank Length Code	Series Code	Feed Direction	Head Length Reference (mm) x 10	Min. Bore Dia. (mm)
E	12	X	SSHM	N	195	14

N·m Recommended Tightening Torque (N·m)

Insert (For E12□-SSHMN○○○-14 / E16□-SSHMN○○○-14) (Coated Carbide)

Dimensions (mm)

Applications	Cat. No.	AC1030U R	AC1030U L	Width of Cut CW	Max. Groove Depth CDX	Corner Radius RE	Cutting Edge Distance WF3	Cutting Edge Distance WF	Thickness S	Cutting Edge Distance E2	Applicable Holder	Fig
Grooving (14 size)	**SSHG R/L 1407400**	●	●	**0.74**	**1.2**	—	5.3	9.0	5.5	0.2	E12□-SSHMN○○○-14 E16□-SSHMN○○○-14	1
	R/L 1408400	●	●	**0.84**	**1.3**	—	5.3	9.0	5.5	0.2		1
	R/L 1409400	●	●	**0.94**	**1.5**	—	5.3	9.0	5.5	0.2		1
	R/L 1410000	●	●	**1.00**	**1.6**	—	5.3	9.0	5.5	0.2		1
	R/L 1410010	●	●	**1.00**	**1.6**	0.10	5.3	9.0	5.5	0.2		2
	R/L 1411900	●	●	**1.19**	**4.0**	—	5.3	9.0	5.2	—		1
	R/L 1413900	●	●	**1.39**	**4.0**	—	5.3	9.0	5.1	—		1
	R/L 1415000	●	●	**1.50**	**4.0**	—	5.3	9.0	5.1	—		1
	R/L 1415010	●	●	**1.50**	**4.0**	0.10	5.3	9.0	5.1	—		2
	R/L 1416900	●	●	**1.69**	**4.0**	—	5.3	9.0	5.1	—		1
	R/L 1420000	●	●	**2.00**	**4.0**	—	5.3	9.0	5.1	—		1
	R/L 1420010	●	●	**2.00**	**4.0**	0.10	5.3	9.0	5.1	—		2
	R/L 1420020	●	●	**2.00**	**4.0**	0.20	5.3	9.0	5.1	—		2
	R/L 1425000	●	●	**2.50**	**4.0**	—	5.3	9.0	5.1	—		1
	R/L 1425010	●	●	**2.50**	**4.0**	0.10	5.3	9.0	5.1	—		2
	R/L 1425020	●	●	**2.50**	**4.0**	0.20	5.3	9.0	5.1	—		2
	R/L 1430000	●	●	**3.00**	**4.0**	—	5.3	9.0	5.1	—		1
	R/L 1430010	●	●	**3.00**	**4.0**	0.10	5.3	9.0	5.1	—		2
	R/L 1430020	●	●	**3.00**	**4.0**	0.20	5.3	9.0	5.1	—		2
Radius Grooving/ Profiling	**SSHR R/L 14100**	●	●	**1.00**	**1.6**	0.50	5.3	9.0	5.2	—		3
	R/L 14120	●	●	**1.20**	**4.0**	0.60	5.3	9.0	5.2	—		3
	R/L 14150	●	●	**1.50**	**4.0**	0.75	5.3	9.0	5.1	—		3
	R/L 14180	●	●	**1.80**	**4.0**	0.90	5.3	9.0	5.1	—		3
	R/L 14200	●	●	**2.00**	**4.0**	1.00	5.3	9.0	5.1	—		3
	R/L 14220	●	●	**2.20**	**4.0**	1.10	5.3	9.0	5.1	—		3
	R/L 14250	●	●	**2.50**	**4.0**	1.25	5.3	9.0	5.1	—		3
	R/L 14300	●	●	**3.00**	**4.0**	1.50	5.3	9.0	5.1	—		3

Fig 1 (Grooving)

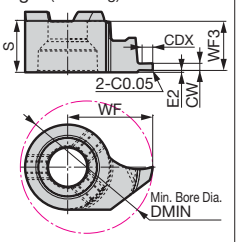


Fig 2 (Grooving)

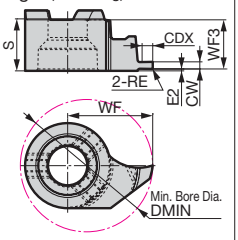


Fig 3 (Radius Grooving/Profiling)

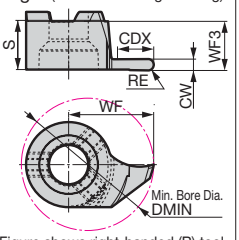


Figure shows right-handed (R) tool.

Min. Bore Dia. DMIN dimension for 14 size: 14mm.

■ Recommended Cutting Conditions

Work Material	P Carbon Steel / Alloy Steel	M Stainless Steel	K Cast Iron
Cutting Speed **vc** (m/min)	20-200	15-80	20-160
Feed Rate **f** (mm/rev)	0.01-0.03	0.01-0.03	0.01-0.03

GWB series

■ Features

- Tangentially-mounted insert enhances tool rigidity.
- Double clamping holder design improves stability during continuous and interrupted grooving. Can also be used for traverse cutting.
- Long tool life for interrupted cutting applications with the new Coated SUMIBORON BNC30G grade for grooving (BN2000 recommended for continuous cutting).
- Suited for grooving various types of hardened steel. Variety of widths of cut available from 1.5 to 6.0mm.

External | CBN

Hardened Steel,
Shallow Grooves Double Clamp

GWB
External Grooving

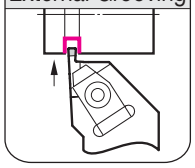


Fig 1

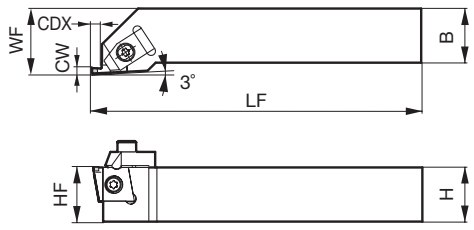


Figure shows right-handed (R) tool.

Holder

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Width of Cut CW	Maximum Groove Depth CDX	Group No.	Fig	Clamp Plate	Cap Screw	N·m	Flat Head Screw	Spring	Wrench
GWB R/L 2525-45	●	●	25	25	151 (150)	30	25	**1.5 ≤ CW ≤ 4.5**	**3.5 to 5.0**	1	1	TF72/TF73	BX0520T	**5.0**	BFTX0511N	GSP06	TRX20
GWB R/L 2525-60	●	●	25	25	151	30	25	**4.5 < CW ≤ 6.0**	**5.0**	2	1						

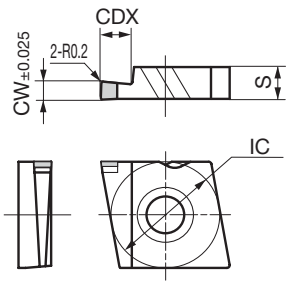
Dimensions in ( ) are for width of cut (CW) of 3.0 or less. Right-handed (R) tool holders are applicable with right-handed (R) inserts and clamp plates (TF72).

Insert (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000 R	BN2000 L	BNC30G R	BNC30G L	Width of Cut CW	Groove Depth CDX	Inscribed Circle IC	Thickness S	Group No.	Applicable Holder	Fig
CGA R/L 1504150	●	●	●	●	**1.5**	3.5	15.875	4.76	1	GWB R/L 2525-45	1
CGA R/L 1504200	●	●	●	●	**2.0**	3.5	15.875	4.76			1
CGA R/L 1504250	●	●	●	●	**2.5**	4.0	15.875	4.76			1
CGA R/L 1504300	●	●	●	●	**3.0**	4.0	15.875	4.76			1
CGA R/L 1504350	●	●	●	●	**3.5**	5.0	15.875	4.76			1
CGA R/L 1504400	●	●	●	●	**4.0**	5.0	15.875	4.76			1
CGA R/L 1504450	●	●	●	●	**4.5**	5.0	15.875	4.76			1
CGA R/L 1506500	●	●	●	●	**5.0**	5.0	15.875	6.35	2	GWB R/L 2525-60	1
CGA R/L 1506550	●	●	●	●	**5.5**	5.0	15.875	6.35			1
CGA R/L 1506600	●	●	●	●	**6.0**	5.0	15.875	6.35			1

Fig 1



* It is also possible to manufacture widths of cut other than those listed above (CW = 1.5 to 6.0mm).

Grade Features

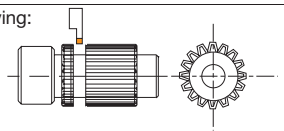
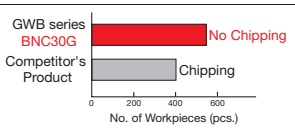
Grade	Application Range	Features	HV(GPa)	TRS(GPa)
BN2000	Continuous Grooving	General-purpose grade with superior wear resistance	31 to 34	1.0 to 1.1
BNC30G	Interrupted Grooving	Grade suited to interrupted grooving. Features tough substrate with special ceramic coating that exhibits both peel-off and wear resistance.	33 to 35	1.1 to 1.2

Recommended Cutting Conditions

Cutting Conditions	H Hardened Steel
Cutting Speed vc (m/min)	80 to 120
Feed Rate f (mm/rev)	0.04 to 0.08

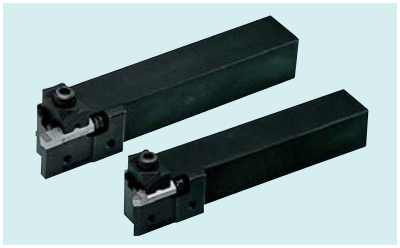
* In order to avoid thermal cracking of the SUMIBORON cutting edge during interrupted cutting, ensure that the work material is thoroughly dry before cutting.

Application Examples

Tooling	Work Material	Tool Cat. No.	Cutting Conditions	Tool Life Comparison
Shaft Grooving: Continuous Required Surface Roughness for Groove Sides: Ra 0.4μm	Carburised steel 58 to 62 HRC	CGAR1504200 BN2000	vc : 120m/min f : 0.05mm/rev Groove Depth: 2mm Dry	
Spline Grooving: Interrupted 	Carburised steel 58 to 62 HRC	CGAR1504200 BNC30G	vc : 100m/min f : 0.05mm/rev Groove Depth: 1.6mm Dry	

N·m Recommended Tightening Torque (N·m)

BNGG series



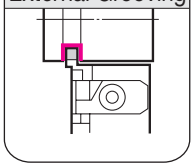
■ Features

- Improved rigidity for longer tool life
  Strong clamping reduces insert fracture and holder chatter
- Enhanced tooling for 2mm fine grooves or threading
  Grooving and threading can be done by changing the support

External CBN

Clamp-on
for Hardened Steel Shallow Grooves

BNGG
External Grooving



BNGG-TT
External Threading

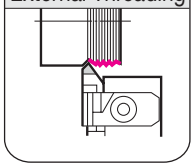


Fig 1 (Grooving)

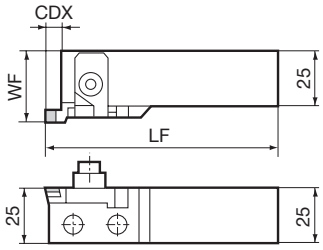
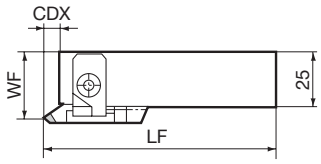


Fig 2 (Threading)



Holder

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Cutting Edge Distance WF	Groove Depth CDX	Overall Length LF	Applicable Insert	Fig
Grooving	**BNGG R/L2525-200**	●		30.5	4	150	BNGNT0200 R/L	1
	BNGG R/L2525-250	●		30.5	4	150	BNGNT0250 R/L	1
	BNGG R/L2525-300	●		30.5	5	150	BNGNT0300 R/L	1
	BNGG R/L2525-400	●		30.5	6	151	BNGNT0400 R/L	1
	BNGG R/L2525-500	●		30.5	6	151	BNGNT0500 R/L	1
	BNGG R/L2525-600	●		30.5	7	152	BNGNT0600 R/L	1
Threading	**BNGG R/L2525-TT**	●		28.5	5	150	BNTT1020 R/L, BNTT1530 R/L	2

Inserts are not included with the tool holders.
* Holder body is universal. The holder can be configured for different groove widths or threading by changing the support.

Insert (SUMIBORON)

Dimensions (mm)

	Cat. No.	BN250 R	BN250 L	BNX20 R	BNX20 L	BN350 R	BN350 L	BNX25 R	BNX25 L	Width of Cut CW	Groove Depth CDX	Corner Radius RE	Overall Length L	Cutting Edge Distance WF3	Applicable Holder	Fig
Grooving	**BNGNT0200 R/L**	●				●				**2.0**	4.0	0.2	25	6.0	BNGG R/L 2525-200	1
	BNGNT0250 R/L	●				●				**2.5**	4.0	0.2	25	6.0	BNGG R/L 2525-250	1
	BNGNT0300 R/L	●				●				**3.0**	5.0	0.4	25	6.0	BNGG R/L 2525-300	1
	BNGNT0400 R/L	●				●				**4.0**	6.0	0.4	26	6.0	BNGG R/L 2525-400	1
	BNGNT0500 R/L	●				●				**5.0**	6.0	0.4	26	6.0	BNGG R/L 2525-500	1
	BNGNT0600 R/L	●				●				**6.0**	7.0	0.4	27	6.0	BNGG R/L 2525-600	1
Threading	**BNTT1020 R/L**	●								Pitch 1.0 to 2.0	0.14	25	4.0		BNGG R/L 2525-TT	2
	BNTT1530 R/L	●								Pitch 1.5 to 3.0	0.2	25	4.0			2

Fig 1 (Grooving)

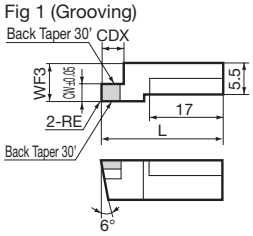
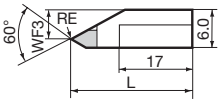


Fig 2 (Threading)



Parts

Applicable Holder	Support	Clamp Plate	Adjustment Screw	Spring	Cap Screw	Wrench	
BNGG R/L2525-200	BNGS R/L 200	BNGC R/L	FMJ	GSP06	BX0615 (For Clamp Plate) BX0414 (For Support)	LH050 (For Clamp Plate) LH030 (For Support)	1.8×45
BNGG R/L2525-250	BNGS R/L 250						
BNGG R/L2525-300	BNGS R/L 300						
BNGG R/L2525-400	BNGS R/L 400						
BNGG R/L2525-500	BNGS R/L 500						
BNGG R/L2525-600	BNGS R/L 600						
BNGG R/L2525-TT	BNGS R/L TT						

Recommended Cutting Conditions

• Grooving

Cutting Conditions	H Hardened Steel
Cutting Speed vc (m/min)	80 to 120
Feed Rate f (mm/rev)	0.03 to 0.07

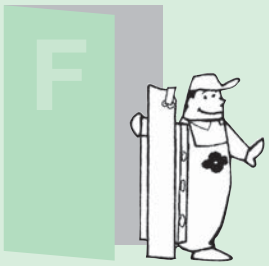
• Threading

Cutting Conditions	H Hardened Steel
Cutting Speed vc (m/min)	80 to 120
Feed Rate f (mm)	Maximum Pitch 3.0

MEMO

Cut-off Tools F

F67 to F96



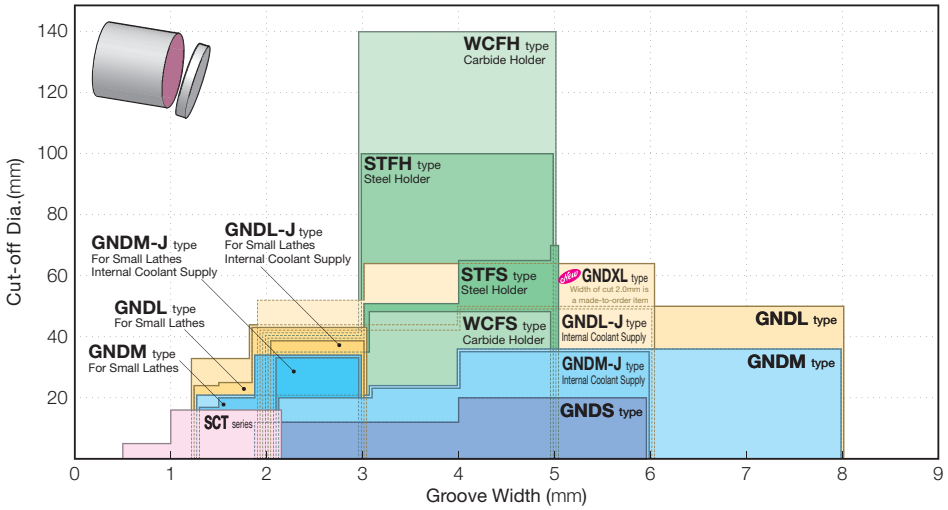
Cut-off Tools		SEC-Cut-off Tool Holder series Selection Guide	F68
		SumiGrip Introduction	F69
	SumiGrip Jr.	STFH type	F70
		STFS type	F72
	SumiGrip	WCFH type	F74
		WCFS type	F76
	SEC-Small Diameter Cut-off Tool Holders	SCT type	F78
	SEC-Cut-off Tool Holders	GNDM type / GNDL type (For Small Lathes)	F80
		GNDM-J type / GNDL-J type (Internal Coolant Supply for Small Lathes)	F82
		GNDS type	F84
		GNDM type	F86
		GNDM-J type (Internal Coolant Supply)	F88
		GNDL type	F90
		GNDL-J type (Internal Coolant Supply)	F92
		New GNDXL type	F94

Stock Markings and Symbols

● ● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stocked item (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

Selection Guide

Cut-off

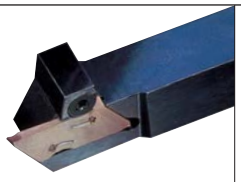
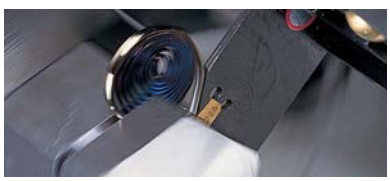


■ Range of Applications (For Solid Workpieces)

Applications	Series	Shape	Insert Shape ( ) indicates no. of cutting edges	Cut-off Dia. / Groove Width	Features
For Small Lathes	**SCT**	→ F78	(2) Right Hand Left-handed Neutral	16.0 / 2.0 / 0.5	· Ground insert with good sharpness · Can clamp even from behind · 2-cornered type inserts
For Small to Medium Diameters	**GND** For Small Lathes **GNDM/GNDM-J** **GNDL/GNDL-J**	→ F80~	(2)	32.0 / 3.0 / 1.25	· High-rigidity design and outstanding chip control · Unground 2-cornered type inserts, available with widths starting at 1.25mm
	GND **GNDS** **GNDM/GNDM-J** **GNDL/GNDL-J** **GNDXL** NEW	→ F84~	Right Hand Left-handed Neutral	50.0 / *2.0 / 8.0	· High-rigidity body, rigid clamping · Outstanding chip control · Unground 2-cornered type inserts
For Medium to Large Diameters	**STFH** **STFS** (SumiGrip Jr.)	→ F70 / F72	(1) Right Hand Left-handed Neutral	100.0 / 2.0 / 5.0	· Can be used for large diameter cut-off up to ø100mm · Economical steel shank · 1-cornered self-grip type inserts
	WCFH **WCFS** (SumiGrip)	→ F74 / F76	(1) Right Hand Left-handed Neutral	140.0 / 2.0 / 5.0	· Can be used for large diameter cut-off up to ø140mm · High-rigidity carbide shank · 1-cornered self-grip type inserts

* Width of cut 2.0mm is a made-to-order item.

■ Cut-off Tool series

SEC-Small Diameter Cut-off Tool Holders **SCT series**		· Our first recommendation for small lathes · Excellent sharpness suppresses cutting resistance and central pips	
SEC-Cut-off Tool Holders **GND series** GNDS type GNDM/GNDM-J type GNDL type / GNDL-J type GNDXL type NEW		· Our first recommendation for small to medium diameters · Enables stable cut-off thanks to high-rigidity body and rigid clamping	
SEC-Cut-off Tool Holders **STFH type / STFS type** Steel Shank (SumiGrip Jr.) **WCFH type / WCFS type** Carbide Shank (SumiGrip)		· Our first recommendation for medium to large diameters · Blade type is also available for cut-off up to ø140mm	

SumiGrip

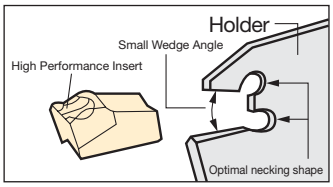
■ Features

- Available in cemented carbide holder (Sumi Grip) and steel holder (SumiGrip Jr.)
- Capable of interrupted cutting
- Can be used for cut-off, grooving, chamfering, etc.

■ Types

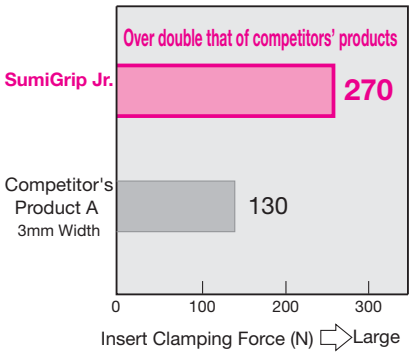
(1) Tool Block type
STFH type (Steel)/
WCFH type (Carbide)

(2) Shank type
STFS type (Steel)/
WCFS type (Carbide)

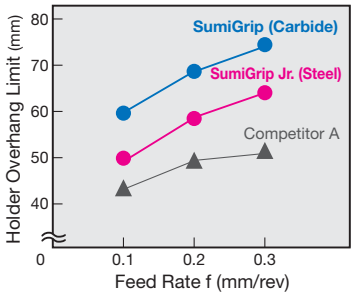


■ Cutting Performance (Holder)

● Insert Clamping Force

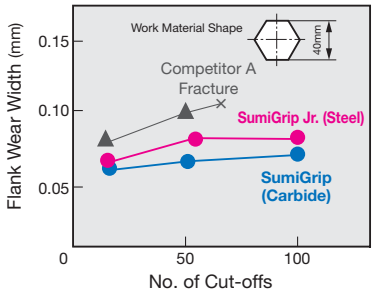


● Holder Overhang



Work Material: S45C (ø50mm, 250HB)
Cutting Conditions: vc = 80m/min Dry

● Wear Resistance



Work Material: S45C (Hex), Insert: 3mm Width Coated
Cutting Conditions: vc = 150m/min, f = 0.15mm/rev
Wet (Water Soluble)

■ GG type / GF type / CF type Chipbreaker + AC1030U

- The grooving tool GND series offers several chipbreakers for excellent chip control.
- Low cutting force chipbreaker GF type (neutral) or CF type (handed) inserts, coupled with a carbide blade, enable stable machining and prevent chattering even when machining stainless steel.
- Achieving stable long tool life with the AC1030U grade.

■ Cutting Performance (Chipbreaker)

● Chip Control (Performance)

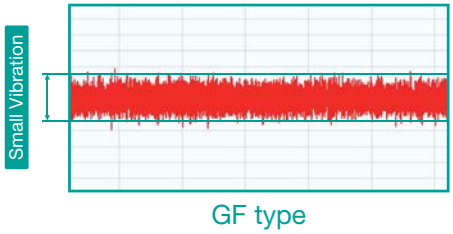
GF type

GG type

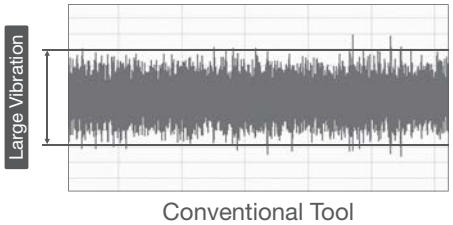
Conventional Tool

Work Material: S45C (ø40mm)
3.0mm Width Cut-off
Cutting Conditions: vc = 100m/min
f = 0.1mm/rev
Wet

● Anti-Vibration Performance



GF type



Conventional Tool

Work Material: SUS316 (ø40mm)
3.0mm Width Cut-off
Cutting Conditions: vc = 100m/min
f = 0.1mm/rev
Wet

STFH type

Cut-off

Cut-off
(Steel Holder/Tool Block type)

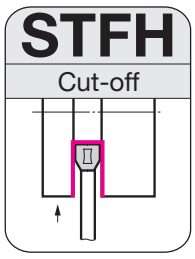
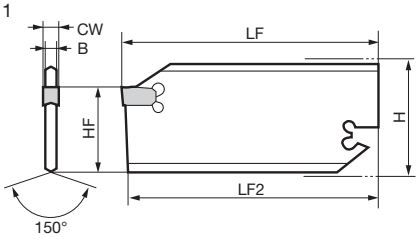
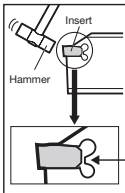


Fig 1



● Insert Mounting Method



Mount the insert by lightly knocking it in with a wooden or plastic hammer.

(Check that the insert cannot be pulled out by hand.)

There is no need to force the insert back end against the holder.

⚠ Note that driving in the insert too far may cause damage to the insert or holder.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Height HF	Reference Length LF2	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Applicable Tool Blocks	Fig	Wrench
STFH 26-2	●	26	1.6	109	21.4	108	**2.0**	**40**	WCF○2□		1	
STFH 26-3	●	26	2.4	109	21.4	108	**3.0**	**70**	WCF○3□	SBN 20-26	1	
STFH 26-4	●	26	3.4	109	21.4	108	**4.0**	**70**	WCF○4□	SBU 20-26	1	SL-4
STFH 26-5	●	26	4.3	109	21.4	108	**5.0**	**70**	WCF○5□		1	
STFH 32-2	●	32	1.6	149	25.0	148	**2.0**	**40**	WCF○2□	SBN 20-32	1	
STFH 32-3	●	32	2.4	149	25.0	148	**3.0**	**100**	WCF○3□	SBN 25-32	1	
STFH 32-4	●	32	3.4	149	25.0	148	**4.0**	**100**	WCF○4□	SBU 20-32	1	SL-4
STFH 32-5	●	32	4.3	149	25.0	148	**5.0**	**100**	WCF○5□	SBU 25-32	1	

* The shape of STFH32-2 is slightly different from the above figure. Refer to F71 for applicable inserts.

Fig 1

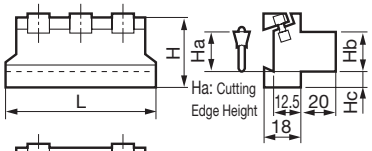


Fig 2

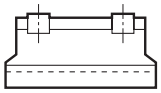


Fig 1

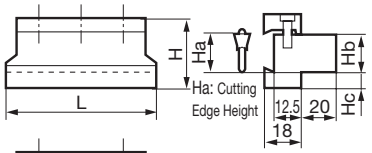
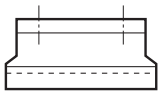


Fig 2



Tool Block SBN type (Integrated)

Parts

Dimensions (mm)

Cat. No.	Stock	Cutting Edge Height Ha	Mounting Length Hb	Mounting Position Hc	Height H	Overall Length L	Fig	Clamp Plate	Double Screw	Wrench
SBN 20-26	●	20	20	10.0	45	80	2			
SBN 20-32	●	20	20	13.5	50	100	1	BWS30	WB8-20	LH040
SBN 25-32	●	25	25	8.5	50	110	1			

Tool Block SBU type (Split type)

Parts

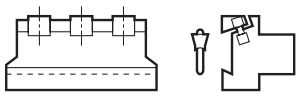
Dimensions (mm)

Cat. No.	Stock	Cutting Edge Height Ha	Mounting Length Hb	Mounting Position Hc	Height H	Overall Length L	Fig	Clamp Wedge	Cap Screw	Wrench
SBU 20-26	●	20	20	10.0	45	80	2	BCS15		
SBU 20-32	●	20	20	13.5	50	100	1	BCS20	BX0622	LH050
SBU 25-32	●	25	25	8.5	50	110	1	BCS25		

Tool Block type Selection Guide

Integrated type

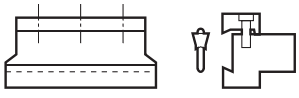
SBN type Example: SBN20-32



· Applicable to toolpost **A** shown on the right.

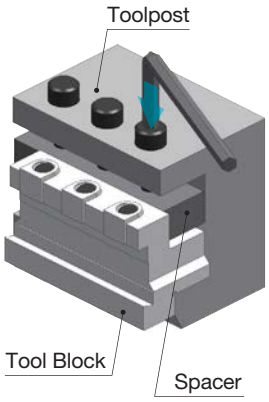
Split type

SBU type Example: SBU20-32



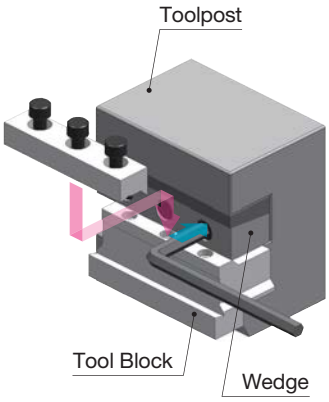
· Applicable to toolposts **A** **B** shown on the right.
· Large clamp plate ensures a wide clamp area that enables long holder overhang.

A General-purpose Lathe, etc.
SBN type | SBU type



(Clamp from above)

B Turret type Toolpost, etc.
SBU type



(Clamp from the side)

STFH type

Fig 1 (Neutral (N))

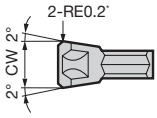


Fig 2 (Right Hand (R))

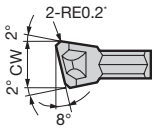
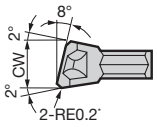


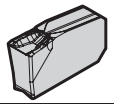
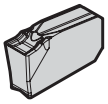
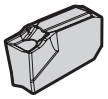
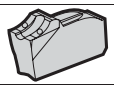
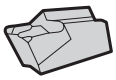
Fig 3 (Left Hand (L))



* WCF□ 2T: 2-RE0.15

Inserts for STFH (SumiGrip / SumiGrip Jr. common) (Coated Carbide / Cermet / Cemented Carbide)

Dimensions (mm)

Appearance	Cat. No.	AC830P	AC225	AC1030U	T1500A	A30	G10E	Width of Cut CW	Applicable Holder	Fig
WCF N○-GG General-purpose 	**WCF N2-GG**	●	—		—	—	—	**2.0**	STFH ○○-2	1
	WCF N3-GG	●	—		—	—	—	**3.0**	STFH ○○-3	1
	WCF N4-GG	●	—		—	—	—	**4.0**	STFH ○○-4	1
	WCF N5-GG	●	—		—	—	—	**5.0**	STFH ○○-5	1
WCF N○-GF Exotic Alloy Low Feed 	**WCF N2-GF**		—	●	—	—	—	**2.0**	STFH ○○-2	1
	WCF N3-GF		—	●	—	—	—	**3.0**	STFH ○○-3	1
	WCF N4-GF		—	●	—	—	—	**4.0**	STFH ○○-4	1
	WCF N5-GF		—	●	—	—	—	**5.0**	STFH ○○-5	1
WCF □○-CF Exotic Alloy Low Feed (Handed) 	**WCF R3-CF**		—	●	—	—	—	**3.0**	STFH ○○-3	2
	WCF L3-CF		—	●	—	—	—	**3.0**		3
	WCF R4-CF		—	●	—	—	—	**4.0**	STFH ○○-4	2
	WCF L4-CF		—	●	—	—	—	**4.0**		3
WCF □2T Small Diameter Low Cutting Force 	**WCF N2T**	●	—	—	—	—	—	**2.0**	STFH ○○-2	1
	WCF R2T	●	—	—	—	—	—	**2.0**		2
	WCF L2T	●	—	—	—	—	—	**2.0**		3
WCF □○ No Chipbreaker For General Steel 	**WCF N3**	●	—	—	—	—	—	**3.0**	STFH ○○-3	1
	WCF R3	●	—	—	—	—	—	**3.0**		2
	WCF L3	●	—	—	—	—	—	**3.0**		3
	WCF N4	●	—	—	—	—	—	**4.0**	STFH ○○-4	1
	WCF R4	●	—	—	—	—	—	**4.0**		2
	WCF L4	●	—	—	—	—	—	**4.0**		3
	WCF N5	●	—	—	—	—	—	**5.0**	STFH ○○-5	1
	WCF R5	●	—	—	—	—	—	**5.0**		2
	WCF L5	●	—	—	—	—	—	**5.0**		3
WCF □○A Exotic Alloy Low Feed	**WCF N2A**		●	—	—			**2.0**	STFH ○○-2	1
	WCF N3A		●	—	●	●	●	**3.0**	STFH ○○-3	1
	WCF R3A		●	—		●		**3.0**		2
	WCF L3A		●	—	—			**3.0**		3
	WCF N4A		●	—	●			**4.0**	STFH ○○-4	1
	WCF R4A		●	—	—			**4.0**		2
	WCF L4A		●	—	—			**4.0**		3
	WCF N5A		●	—	—			**5.0**	STFH ○○-5	1
	WCF R5A		—	—	—			**5.0**		2
	WCF L5A		—	—	—			**5.0**		3
WCF □○B Cast Iron Light Alloys	**WCF N3B**		—	—	—	—	●	**3.0**	STFH ○○-3	1
	WCF R3B		—	—	—	—	●	**3.0**		2
	WCF L3B		—	—	—	—	●	**3.0**		3
	WCF N4B		—	—	—	—	●	**4.0**	STFH ○○-4	1
	WCF R4B		—	—	—	—	●	**4.0**		2
	WCF L4B		—	—	—	—		**4.0**		3
* Same chipbreaker shape as the type for general steel (WCF□○), but with smaller cutting edge treatment.	**WCF N5B**		—	—	—	—	●	**5.0**	STFH ○○-5	1
	WCF R5B		—	—	—	—		**5.0**		2
	WCF L5B		—	—	—	—	●	**5.0**		3

Recommended Cutting Conditions

Work Material		Cutting Speed **vc** (m/min)					
		Coated Carbide			Cermet	Cemented Carbide	
		AC830P	AC225	AC1030U	T1500A	A30	G10E
P Steel	General Steel	80 to 200	80 to 200	50 to 200	80 to 200	50 to 120	—
	Mild Steel	100 to 230	100 to 230	50 to 230	100 to 230	70 to 150	—
	Die Steel	60 to 150	60 to 150	50 to 150	60 to 150	50 to 120	—
M Stainless Steel		70 to 150	60 to 150	50 to 150	—	70 to 130	—
K Cast Iron		—	—	50 to 200	—	—	50 to 120
N Non-Ferrous Metal		—	—	200 to 500	—	—	200 to 500

Chipbreaker		Feed Rate **f** (mm/rev)										
		Neutral						Handed				
		GG	**GF**	No Chipbreaker	**T**	**A**	**B**	No Chipbreaker	**CF**	**T**	**A**	**B**
		General-purpose	Exotic Alloy/Low Cutting Force type	General Steel	Small Diameter/ Low Cutting Force	Exotic Alloy/Low Feed	Cast Iron/Light Alloys	General Steel	Exotic Alloy/Low Cutting Force type	Small Diameter/ Low Cutting Force	Exotic Alloy/Low Feed	Cast Iron/Light Alloys
Width of Cut CW (mm)	**2.0**	0.05 to 0.20	0.03 to 0.12	—	0.03 to 0.10	0.03 to 0.12	—	—	—	0.03 to 0.10	—	—
	3.0	0.08 to 0.25	0.04 to 0.15	0.08 to 0.25	—	0.04 to 0.15	0.05 to 0.15	0.08 to 0.25	0.05 to 0.12	—	0.04 to 0.15	0.05 to 0.15
	4.0	0.10 to 0.30	0.05 to 0.18	0.10 to 0.30	—	0.05 to 0.18	0.05 to 0.18	0.10 to 0.30	0.05 to 0.12	—	0.05 to 0.18	0.05 to 0.18
	5.0	0.10 to 0.35	0.05 to 0.20	0.10 to 0.30	—	0.05 to 0.20	0.06 to 0.20	0.10 to 0.30	—	—	—	0.06 to 0.20

STFS type

Cut-off

For Cut-off
(Steel Holder/Shank type)

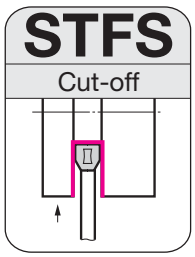


Fig 1

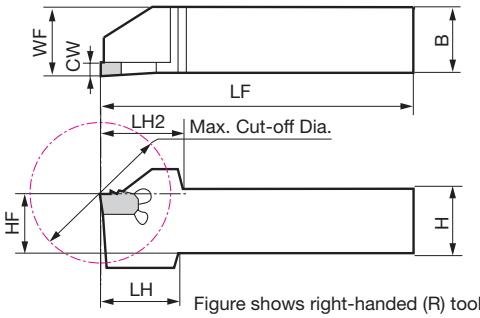
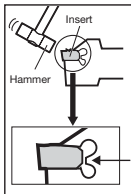


Figure shows right-handed (R) tool.

● Insert Mounting Method



Mount the insert by lightly knocking it in with a wooden or plastic hammer.

(Check that the insert cannot be pulled out by hand.)

There is no need to force the insert back end against the holder.

⚠ Note that driving in the insert too far may cause damage to the insert or holder.

Holder

Parts Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Head LH2	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Wrench
STFS R/L1010-2	●	●	10	10	86	10	10	17	17	**2.0**	**28**	WCF○2□	1	SL-4
STFS R/L1212-2	●	●	12	12	110	12	12	18	18	**2.0**	**30**		1	
STFS R/L1616-2	●	●	16	16	110	16	16	—	19	**2.0**	**32**		1	
STFS R/L2020-2	●	●	20	20	125	20	20	—	24	**2.0**	**40**		1	
STFS R/L1616-3	●	●	16	16	110	16	16	20	22	**3.0**	**35**	WCF○3□	1	SL-4
STFS R/L2012-3	●	●	20	12	110	12	20	—	24	**3.0**	**40**		1	
STFS R/L2020-3	●	●	20	20	125	20	20	—	30	**3.0**	**50**		1	
STFS R/L2525-3	●	●	25	25	150	25	25	—	30	**3.0**	**50**		1	
STFS R/L2020-4	●	●	20	20	125	20	20	—	33	**4.0**	**55**	WCF○4□	1	SL-4
STFS R/L2525-4	●	●	25	25	150	25	25	—	38	**4.0**	**65**		1	
STFS R/L2020-5	●	●	20	20	125	20	20	—	35	**5.0**	**60**	WCF○5□	1	SL-4
STFS R/L2525-5	●	●	25	25	150	25	25	—	40	**5.0**	**70**		1	

Refer to F73 for applicable inserts.

STFS type

Fig 1 (Neutral (N))

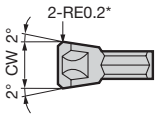


Fig 2 (Right Hand (R))

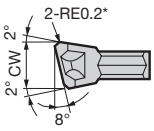
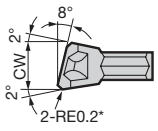


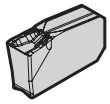
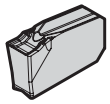
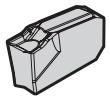
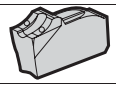
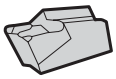
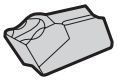
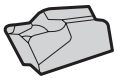
Fig 3 (Left Hand (L))



* WCF□ 2T: 2-RE0.15

Inserts for STFS (SumiGrip / SumiGrip Jr. common) (Coated Carbide / Cermet / Cemented Carbide)

Dimensions (mm)

Appearance	Cat. No.	AC830P	AC225	AC1030U	T1500A	A30	G10E	Width of Cut CW	Applicable Holder	Fig
WCF N○-GG General-purpose 	**WCF N2-GG**	●	—		—	—	—	**2.0**	STFS R/L○○○○-2	1
	WCF N3-GG	●	—		—	—	—	**3.0**	STFS R/L○○○○-3	1
	WCF N4-GG	●	—		—	—	—	**4.0**	STFS R/L○○○○-4	1
	WCF N5-GG	●	—		—	—	—	**5.0**	STFS R/L○○○○-5	1
WCF N○-GF Exotic Alloy Low Feed 	**WCF N2-GF**		—	●	—	—	—	**2.0**	STFS R/L○○○○-2	1
	WCF N3-GF		—	●	—	—	—	**3.0**	STFS R/L○○○○-3	1
	WCF N4-GF		—	●	—	—	—	**4.0**	STFS R/L○○○○-4	1
	WCF N5-GF		—	●	—	—	—	**5.0**	STFS R/L○○○○-5	1
WCF □○-CF Exotic Alloy Low Feed (Handed) 	**WCF R3-CF**		—	●	—	—	—	**3.0**	STFS R/L○○○○-3	2
	WCF L3-CF		—	●	—	—	—	**3.0**		3
	WCF R4-CF		—	●	—	—	—	**4.0**	STFS R/L○○○○-4	2
	WCF L4-CF		—	●	—	—	—	**4.0**		3
WCF □2T Small Diameter Low Cutting Force 	**WCF N2T**	●	—	—	—	—	—	**2.0**	STFS R/L○○○○-2	1
	WCF R2T	●	—	—	—	—	—	**2.0**		2
	WCF L2T	●	—	—	—	—	—	**2.0**		3
WCF □○ No Chipbreaker For General Steel 	**WCF N3**	●	—	—	—	—	—	**3.0**	STFS R/L○○○○-3	1
	WCF R3	●	—	—	—	—	—	**3.0**		2
	WCF L3	●	—	—	—	—	—	**3.0**		3
	WCF N4	●	—	—	—	—	—	**4.0**	STFS R/L○○○○-4	1
	WCF R4	●	—	—	—	—	—	**4.0**		2
	WCF L4	●	—	—	—	—	—	**4.0**		3
	WCF N5	●	—	—	—	—	—	**5.0**	STFS R/L○○○○-5	1
	WCF R5	●	—	—	—	—	—	**5.0**		2
	WCF L5	●	—	—	—	—	—	**5.0**		3
WCF □○A Exotic Alloy Low Feed 	**WCF N2A**		●	—	—			**2.0**	STFS R/L○○○○-2	1
	WCF N3A		●	—	●	●	●	**3.0**	STFS R/L○○○○-3	1
	WCF R3A		●	—		●		**3.0**		2
	WCF L3A		●	—	—			**3.0**		3
	WCF N4A		●	—	●			**4.0**	STFS R/L○○○○-4	1
	WCF R4A		●	—	—			**4.0**		2
	WCF L4A		●	—	—			**4.0**		3
	WCF N5A		●	—	—			**5.0**	STFS R/L○○○○-5	1
	WCF R5A		—	—	—			**5.0**		2
	WCF L5A		—	—	—			**5.0**		3
WCF □○B Cast Iron Light Alloys 	**WCF N3B**		—	—	—	—	●	**3.0**	STFS R/L○○○○-3	1
	WCF R3B		—	—	—	—	●	**3.0**		2
	WCF L3B		—	—	—	—	●	**3.0**		3
	WCF N4B		—	—	—	—	●	**4.0**	STFS R/L○○○○-4	1
	WCF R4B		—	—	—	—	●	**4.0**		2
	WCF L4B		—	—	—	—		**4.0**		3
	WCF N5B		—	—	—	—	●	**5.0**	STFS R/L○○○○-5	1
	WCF R5B		—	—	—	—		**5.0**		2
	WCF L5B		—	—	—	—	●	**5.0**		3

* Same chipbreaker shape as the type for general steel (WCF□○), but with smaller cutting edge treatment.

Recommended Cutting Conditions

Work Material		Cutting Speed **vc** (m/min)					
		Coated Carbide			Cermet	Cemented Carbide	
		AC830P	AC225	AC1030U	T1500A	A30	G10E
P Steel	General Steel	80 to 200	80 to 200	50 to 200	80 to 200	50 to 120	—
	Mild Steel	100 to 230	100 to 230	50 to 230	100 to 230	70 to 150	—
	Die Steel	60 to 150	60 to 150	50 to 150	60 to 150	50 to 120	—
M Stainless Steel		70 to 150	60 to 150	50 to 150	—	70 to 130	—
K Cast Iron		—	—	50 to 200	—	—	50 to 120
N Non-Ferrous Metal		—	—	200 to 500	—	—	200 to 500

Chipbreaker		Feed Rate **f** (mm/rev)										
		Neutral						Handed				
		GG	**GF**	No Chipbreaker	**T**	**A**	**B**	No Chipbreaker	**CF**	**T**	**A**	**B**
		General-purpose	Exotic Alloy/Low Cutting Force type	General Steel	Small Diameter/ Low Cutting Force	Exotic Alloy/Low Feed	Cast Iron/Light Alloys	General Steel	Exotic Alloy/Low Cutting Force type	Small Diameter/ Low Cutting Force	Exotic Alloy/Low Feed	Cast Iron/Light Alloys
Width of Cut CW (mm)	**2.0**	0.05 to 0.20	0.03 to 0.12	—	0.03 to 0.10	0.03 to 0.12	—	—	—	0.03 to 0.10	—	—
	3.0	0.08 to 0.25	0.04 to 0.15	0.08 to 0.25	—	0.04 to 0.15	0.05 to 0.15	0.08 to 0.25	0.05 to 0.12	—	0.04 to 0.15	0.05 to 0.15
	4.0	0.10 to 0.30	0.05 to 0.18	0.10 to 0.30	—	0.05 to 0.18	0.05 to 0.18	0.10 to 0.30	0.05 to 0.12	—	0.05 to 0.18	0.05 to 0.18
	5.0	0.10 to 0.35	0.05 to 0.20	0.10 to 0.30	—	0.05 to 0.20	0.06 to 0.20	0.10 to 0.30	—	—	—	0.06 to 0.20

WCFH type

Cut-off

For Cut-off
(Carbide Holder/Tool Block type)

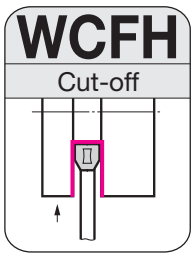


Fig 1

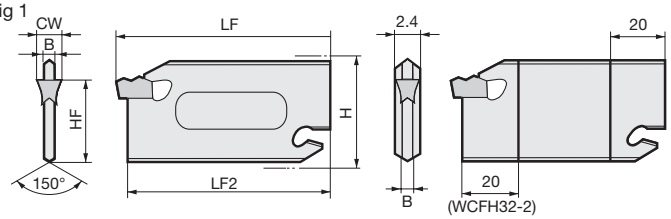
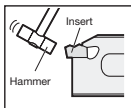


Figure shows right-handed (R) tool.

● Insert Mounting Method



Mount the insert by lightly knocking it in with a wooden or plastic hammer.
(Check that the insert cannot be pulled out by hand.)

⚠ Note that driving in the insert too far may cause damage to the insert or holder.

Holder

Parts Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Height HF	Reference Length LF2	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Applicable Tool Blocks	Fig	Wrench
WCFH 26-2	●	26	1.7	110	21.4	109.0	**2.0**	**40**	WCF□2○		1	SL-2
WCFH 26-3	●	26	2.4	110	21.4	108.5	**3.0**	**80**	WCF□3○	SBN 20-26	1	
WCFH 26-4	●	26	3.4	110	21.4	108.5	**4.0**	**80**	WCF□4○	SBU 20-26	1	SL-1
WCFH 26-5	●	26	4.3	110	21.4	108.5	**5.0**	**80**	WCF□5○		1	
WCFH 32-2	●	32	1.7	150	25.0	149.0	**2.0**	**40**	WCF□2○	SBN 20-32	1	SL-2
WCFH 32-3	●	32	2.4	150	25.0	148.5	**3.0**	**140**	WCF□3○	SBN 25-32	1	
WCFH 32-4	●	32	3.4	150	25.0	148.5	**4.0**	**140**	WCF□4○	SBU 20-32	1	SL-1
WCFH 32-5	●	32	4.3	150	25.0	148.5	**5.0**	**140**	WCF□5○	SBU 25-32	1	

Refer to F75 for applicable inserts.

Fig 1

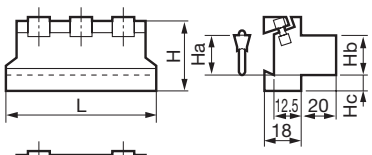


Fig 2

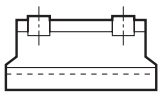


Fig 1

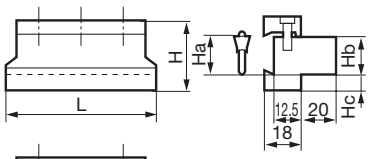
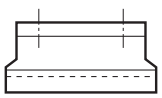


Fig 2



Tool Block SBN type (Integrated) Parts

Dimensions (mm)

Cat. No.	Stock	Cutting Edge Height Ha	Mounting Length Hb	Mounting Position Hc	Height H	Overall Length L	Fig	Clamp Plate	Double Screw	Wrench
SBN 20-26	●	20	20	10.0	45	80	2			
SBN 20-32	●	20	20	13.5	50	100	1	BWS30	WB8-20	LH040
SBN 25-32	●	25	25	8.5	50	110	1			

Tool Block SBU type (Split type) Parts

Dimensions (mm)

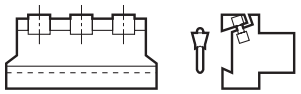
Cat. No.	Stock	Cutting Edge Height Ha	Mounting Length Hb	Mounting Position Hc	Height H	Overall Length L	Fig	Clamp Wedge	Cap Screw	Wrench
SBU 20-26	●	20	20	10.0	45	80	2	BCS15		
SBU 20-32	●	20	20	13.5	50	100	1	BCS20	BX0622	LH050
SBU 25-32	●	25	25	8.5	50	110	1	BCS25		

BCS15 BCS20 BCS25

Tool Block type Selection Guide

Integrated type

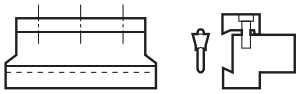
SBN type Example: SBN20-32



· Applicable to toolpost **A** shown on the right.

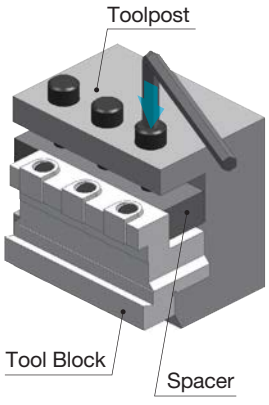
Split type

SBU type Example: SBU20-32



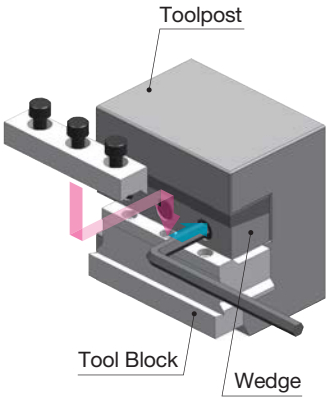
· Applicable to toolposts **A** **B** shown on the right.
· Large clamp plate ensures a wide clamp area that enables long holder overhang.

A General-purpose Lathe, etc.
SBN type | SBU type



(Clamp from above)

B Turret type Toolpost, etc.
SBU type



(Clamp from the side)

WCFH type

Fig 1 (Neutral (N))

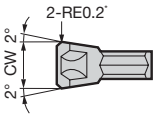


Fig 2 (Right Hand (R))

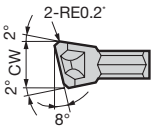
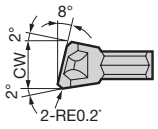


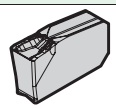
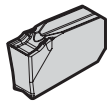
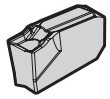
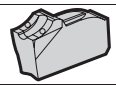
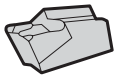
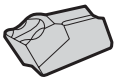
Fig 3 (Left Hand (L))



* WCF□ 2T: 2-RE0.15

Inserts for WCFH (SumiGrip / SumiGrip Jr. common) (Coated Carbide / Cermet / Cemented Carbide)

Dimensions (mm)

Appearance	Cat. No.	AC830P	AC225	AC1030U	T1500A	A30	G10E	Width of Cut CW	Applicable Holder	Fig
WCF N○-GG General-purpose 	**WCF N2-GG**	●	—		—	—	—	**2.0**	WCFH ○○-2	1
	WCF N3-GG	●	—		—	—	—	**3.0**	WCFH ○○-3	1
	WCF N4-GG	●	—		—	—	—	**4.0**	WCFH ○○-4	1
	WCF N5-GG	●	—		—	—	—	**5.0**	WCFH ○○-5	1
WCF N○-GF Exotic Alloy Low Feed 	**WCF N2-GF**		—	●	—	—	—	**2.0**	WCFH ○○-2	1
	WCF N3-GF		—	●	—	—	—	**3.0**	WCFH ○○-3	1
	WCF N4-GF		—	●	—	—	—	**4.0**	WCFH ○○-4	1
	WCF N5-GF		—	●	—	—	—	**5.0**	WCFH ○○-5	1
WCF □○-CF Exotic Alloy Low Feed (Handed) 	**WCF R3-CF**		—	●	—	—	—	**3.0**	WCFH ○○-3	2
	WCF L3-CF		—	●	—	—	—	**3.0**		3
	WCF R4-CF		—	●	—	—	—	**4.0**	WCFH ○○-4	2
	WCF L4-CF		—	●	—	—	—	**4.0**		3
WCF □2T Small Diameter Low Cutting Force 	**WCF N2T**	●	—	—	—	—	—	**2.0**	WCFH ○○-2	1
	WCF R2T	●	—	—	—	—	—	**2.0**		2
	WCF L2T	●	—	—	—	—	—	**2.0**		3
WCF □○ No Chipbreaker For General Steel 	**WCF N3**	●	—	—	—	—	—	**3.0**	WCFH ○○-3	1
	WCF R3	●	—	—	—	—	—	**3.0**		2
	WCF L3	●	—	—	—	—	—	**3.0**		3
	WCF N4	●	—	—	—	—	—	**4.0**	WCFH ○○-4	1
	WCF R4	●	—	—	—	—	—	**4.0**		2
	WCF L4	●	—	—	—	—	—	**4.0**		3
	WCF N5	●	—	—	—	—	—	**5.0**	WCFH ○○-5	1
	WCF R5	●	—	—	—	—	—	**5.0**		2
	WCF L5	●	—	—	—	—	—	**5.0**		3
WCF □○A Exotic Alloy Low Feed 	**WCF N2A**		●	—	—			**2.0**	WCFH ○○-2	1
	WCF N3A		●	—	●	●	●	**3.0**	WCFH ○○-3	1
	WCF R3A		●	—		●		**3.0**		2
	WCF L3A		●	—	—			**3.0**		3
	WCF N4A		●	—	●			**4.0**	WCFH ○○-4	1
	WCF R4A		●	—	—			**4.0**		2
	WCF L4A		●	—	—			**4.0**		3
	WCF N5A		●	—	—			**5.0**	WCFH ○○-5	1
	WCF R5A		—	—	—			**5.0**		2
	WCF L5A		—	—	—			**5.0**		3
WCF □○B Cast Iron Light Alloys	**WCF N3B**		—	—	—	—	●	**3.0**	WCFH ○○-3	1
	WCF R3B		—	—	—	—	●	**3.0**		2
	WCF L3B		—	—	—	—	●	**3.0**		3
	WCF N4B		—	—	—	—	●	**4.0**	WCFH ○○-4	1
	WCF R4B		—	—	—	—	●	**4.0**		2
	WCF L4B		—	—	—	—		**4.0**		3
	WCF N5B		—	—	—	—	●	**5.0**	WCFH ○○-5	1
	WCF R5B		—	—	—	—		**5.0**		2
	WCF L5B		—	—	—	—	●	**5.0**		3

* Same chipbreaker shape as the type for general steel (WCF□○), but with smaller cutting edge treatment.

Recommended Cutting Conditions

Work Material		Cutting Speed **vc** (m/min)					
		Coated Carbide			Cermet	Cemented Carbide	
		AC830P	AC225	AC1030U	T1500A	A30	G10E
P Steel	General Steel	80 to 200	80 to 200	50 to 200	80 to 200	50 to 120	—
	Mild Steel	100 to 230	100 to 230	50 to 230	100 to 230	70 to 150	—
	Die Steel	60 to 150	60 to 150	50 to 150	60 to 150	50 to 120	—
M Stainless Steel		70 to 150	60 to 150	50 to 150	—	70 to 130	—
K Cast Iron		—	—	50 to 200	—	—	50 to 120
N Non-Ferrous Metal		—	—	200 to 500	—	—	200 to 500

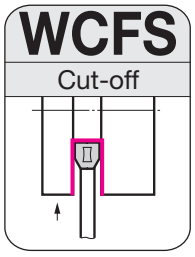
Chipbreaker		Feed Rate **f** (mm/rev)										
		Neutral						Handed				
		GG	**GF**	No Chipbreaker	**T**	**A**	**B**	No Chipbreaker	**CF**	**T**	**A**	**B**
		General-purpose	Exotic Alloy/Low Cutting Force type	General Steel	Small Diameter/ Low Cutting Force	Exotic Alloy/Low Feed	Cast Iron/Light Alloys	General Steel	Exotic Alloy/Low Cutting Force type	Small Diameter/ Low Cutting Force	Exotic Alloy/Low Feed	Cast Iron/Light Alloys
Width of Cut CW (mm)	**2.0**	0.05 to 0.20	0.03 to 0.12	—	0.03 to 0.10	0.03 to 0.12	—	—	—	0.03 to 0.10	—	—
	3.0	0.08 to 0.25	0.04 to 0.15	0.08 to 0.25	—	0.04 to 0.15	0.05 to 0.15	0.08 to 0.25	0.05 to 0.12	—	0.04 to 0.15	0.05 to 0.15
	4.0	0.10 to 0.30	0.05 to 0.18	0.10 to 0.30	—	0.05 to 0.18	0.05 to 0.18	0.10 to 0.30	0.05 to 0.12	—	0.05 to 0.18	0.05 to 0.18
	5.0	0.10 to 0.35	0.05 to 0.20	0.10 to 0.30	—	0.05 to 0.20	0.06 to 0.20	0.10 to 0.30	—	—	—	0.06 to 0.20

WCFS type

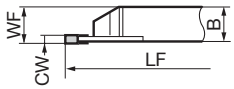
Cut-off

For Cut-off
(Carbide Holder/Shank type)

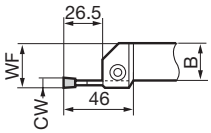
WCFS
Cut-off



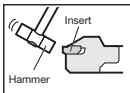
Brazed Blade type



Blade Clamp type



● Insert Mounting Method



Mount the insert by lightly knocking it in with a wooden or plastic hammer.
(Check that the insert cannot be pulled out by hand.)

⚠ Note that driving in the insert too far may cause damage to the insert or holder.

Fig 1

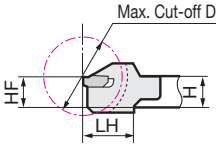


Fig 2

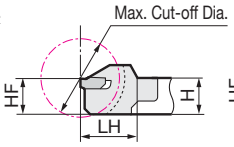


Fig 3

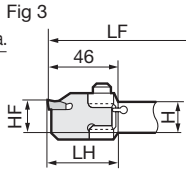


Fig 4

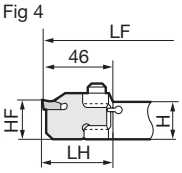


Figure shows right-handed (R) tool.

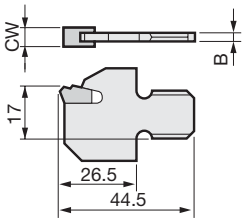
Holder

Parts Dimensions (mm)

Type	Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Height HF	Head LH	Width of Cut CW	Max. Cut-off Dia.	Applicable Blades	Applicable Insert	Fig	Wrench
Brazed type	**WCFS R/L1010-2**	●	●	10	10	86	10	10	**2.0**	**28**	—	WCF□2○	1	
	R/L1212-2	●	●	12	12	110	12	18	**2.0**	**30**	—	WCF□2○	1	SL-2
	R/L1616-2	●	●	16	16	100	16	25	**2.0**	**35**	—	WCF□2○	2	
	R/L1616-3	●	●	16	16	100	16	25	**3.0**	**35**	—	WCF□3○	2	SL-1
Clamp type	**WCFS R/L20-3**	●	●	20	20	125	20	46	**3.0**	**50**	WCFH17-3	WCF□3○	3	
	R/L20-4	●	●	20	20	125	20	46	**4.0**	**50**	WCFH17-4	WCF□4○	3	SL-1
	R/L20-5	●		20	20	125	20	46	**5.0**	**50**	WCFH17-5	WCF□5○	3	
	WCFS R/L25-3	●	●	25	25	150	25	46	**3.0**	**50**	WCFH17-3	WCF□3○	4	
	R/L25-4	●	●	25	25	150	25	46	**4.0**	**50**	WCFH17-4	WCF□4○	4	SL-1
	R/L25-5	●		25	25	150	25	46	**5.0**	**50**	WCFH17-5	WCF□5○	4	

Refer to F77 for applicable inserts. Blade is included with the holder.

Fig 1



Blade

Dimensions (mm)

Cat. No.	Stock	Width of Cut CW	Width B	Applicable Holder
WCFH 17-3	●	**3**	2.4	WCFS R/L20-3,25-3
WCFH 17-4	●	**4**	3.4	WCFS R/L20-4,25-4
WCFH 17-5	●	**5**	4.3	WCFS R/L20-5,25-5

Parts

Applicable Holder	Cap Screw	Wrench
WCFS R/L20-○, WCFS R/L25-○	BX0622	LH050

WCFS type

Fig 1 (Neutral (N))

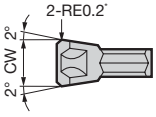


Fig 2 (Right Hand (R))

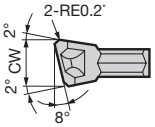
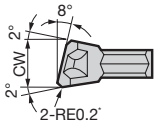


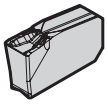
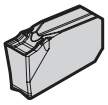
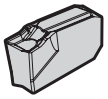
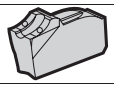
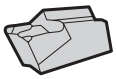
Fig 3 (Left Hand (L))



* WCF□ 2T: 2-RE0.15

Inserts for WCFS (SumiGrip / SumiGrip Jr. common) (Coated Carbide / Cermet / Cemented Carbide)

Dimensions (mm)

Appearance	Cat. No.	AC830P	AC225	AC1030U	T1500A	A30	G10E	Width of Cut CW	Applicable Holder	Fig
WCF N○-GG General-purpose 	**WCF N2-GG**	●	—		—	—	—	**2.0**	WCFS R/L○○○○-2	1
	WCF N3-GG	●	—		—	—	—	**3.0**	WCFS R/L○○○○-3,WCFS R/L○○-3	1
	WCF N4-GG	●	—		—	—	—	**4.0**	WCFS R/L○○-4	1
	WCF N5-GG	●	—		—	—	—	**5.0**	WCFS R/L○○-5	1
WCF N○-GF Exotic Alloy Low Feed 	**WCF N2-GF**		—	●	—	—	—	**2.0**	WCFS R/L○○○○-2	1
	WCF N3-GF		—	●	—	—	—	**3.0**	WCFS R/L○○○○-3,WCFS R/L○○-3	1
	WCF N4-GF		—	●	—	—	—	**4.0**	WCFS R/L○○-4	1
	WCF N5-GF		—	●	—	—	—	**5.0**	WCFS R/L○○-5	1
WCF □○-CF Exotic Alloy Low Feed (Handed) 	**WCF R3-CF**		—	●	—	—	—	**3.0**	WCFS R/L○○○○-3	2
	WCF L3-CF		—	●	—	—	—	**3.0**	WCFS R/L○○-3	3
	WCF R4-CF		—	●	—	—	—	**4.0**	WCFS R/L○○-4	2
	WCF L4-CF		—	●	—	—	—	**4.0**		3
WCF □2T Small Diameter Low Cutting Force 	**WCF N2T**	●	—	—	—	—	—	**2.0**	WCFS R/L○○○○-2	1
	WCF R2T	●	—	—	—	—	—	**2.0**		2
	WCF L2T	●	—	—	—	—	—	**2.0**		3
WCF □○ No Chipbreaker For General Steel 	**WCF N3**	●	—	—	—	—	—	**3.0**	WCFS R/L○○○○-3	1
	WCF R3	●	—	—	—	—	—	**3.0**	WCFS R/L○○-3	2
	WCF L3	●	—	—	—	—	—	**3.0**		3
	WCF N4	●	—	—	—	—	—	**4.0**	WCFS R/L○○-4	1
	WCF R4	●	—	—	—	—	—	**4.0**		2
	WCF L4	●	—	—	—	—	—	**4.0**		3
	WCF N5	●	—	—	—	—	—	**5.0**	WCFS R/L○○-5	1
	WCF R5	●	—	—	—	—	—	**5.0**		2
	WCF L5	●	—	—	—	—	—	**5.0**		3
WCF □○A Exotic Alloy Low Feed	**WCF N2A**		●	—	—			**2.0**	WCFS R/L○○○○-2	1
	WCF N3A		●	—	●	●	●	**3.0**	WCFS R/L○○○○-3	1
	WCF R3A		●	—		●		**3.0**	WCFS R/L○○-3	2
	WCF L3A		●	—	—			**3.0**		3
	WCF N4A		●	—	●			**4.0**	WCFS R/L○○-4	1
	WCF R4A		●	—	—			**4.0**		2
	WCF L4A		●	—	—			**4.0**		3
	WCF N5A		●	—	—			**5.0**	WCFS R/L○○-5	1
	WCF R5A		—	—	—			**5.0**		2
	WCF L5A		—	—	—			**5.0**		3
WCF □○B Cast Iron Light Alloys	**WCF N3B**		—	—	—	—	●	**3.0**	WCFS R/L○○○○-3	1
	WCF R3B		—	—	—	—	●	**3.0**	WCFS R/L○○-3	2
	WCF L3B		—	—	—	—	●	**3.0**		3
	WCF N4B		—	—	—	—	●	**4.0**	WCFS R/L○○-4	1
	WCF R4B		—	—	—	—	●	**4.0**		2
	WCF L4B		—	—	—	—		**4.0**		3
	WCF N5B		—	—	—	—	●	**5.0**	WCFS R/L○○-5	1
	WCF R5B		—	—	—	—		**5.0**		2
	WCF L5B		—	—	—	—	●	**5.0**		3

* Same chipbreaker shape as the type for general steel (WCF□○), but with smaller cutting edge treatment.

Recommended Cutting Conditions

Work Material		Cutting Speed vc (m/min)					
		Coated Carbide			Cermet	Cemented Carbide	
		AC830P	AC225	AC1030U	T1500A	A30	G10E
P Steel	General Steel	80 to 200	80 to 200	50 to 200	80 to 200	50 to 120	—
	Mild Steel	100 to 230	100 to 230	50 to 230	100 to 230	70 to 150	—
	Die Steel	60 to 150	60 to 150	50 to 150	60 to 150	50 to 120	—
M Stainless Steel		70 to 150	60 to 150	50 to 150	—	70 to 130	—
K Cast Iron		—	—	50 to 200	—	—	50 to 120
N Non-Ferrous Metal		—	—	200 to 500	—	—	200 to 500

Chipbreaker		Feed Rate f (mm/rev)										
		Neutral						Handed				
		GG	GF	No Chipbreaker	T	A	B	No Chipbreaker	CF	T	A	B
		General-purpose	Exotic Alloy/Low Cutting Force type	General Steel	Small Diameter/ Low Cutting Force	Exotic Alloy/Low Feed	Cast Iron/Light Alloys	General Steel	Exotic Alloy/Low Cutting Force type	Small Diameter/ Low Cutting Force	Exotic Alloy/Low Feed	Cast Iron/Light Alloys
Width of Cut CW (mm)	**2.0**	0.05 to 0.20	0.03 to 0.12	—	0.03 to 0.10	0.03 to 0.12	—	—	—	0.03 to 0.10	—	—
	3.0	0.08 to 0.25	0.04 to 0.15	0.08 to 0.25	—	0.04 to 0.15	0.05 to 0.15	0.08 to 0.25	0.05 to 0.12	—	0.04 to 0.15	0.05 to 0.15
	4.0	0.10 to 0.30	0.05 to 0.18	0.10 to 0.30	—	0.05 to 0.18	0.05 to 0.18	0.10 to 0.30	0.05 to 0.12	—	0.05 to 0.18	0.05 to 0.18
	5.0	0.10 to 0.35	0.05 to 0.20	0.10 to 0.30	—	0.05 to 0.20	0.06 to 0.20	0.10 to 0.30	—	—	—	0.06 to 0.20

SCT type

Cut-off

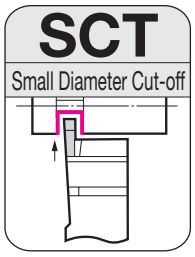


Fig 1

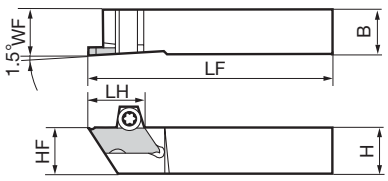


Fig 2

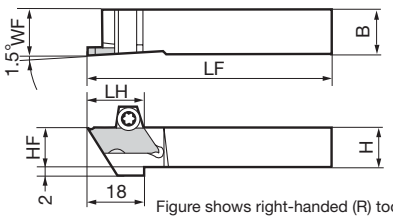


Figure shows right-handed (R) tool.

SumiSmall

Holder (Right-Hand)

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig	Parts: Flat Head Screw	Parts: Wrench
SCT R1010	●	10	10	120	10	10	15	CT R05○○○○(-NB) CT R12○○○○(-NB)	1	BFTX0410T8L	TRX08
SCT R1212	●	12	12	120	12	12	15		1		
SCT R1616	●	16	16	120	16	16	15		1		
SCT R1010-16	●	10	10	120	10	10	18	CT R16○○○○(-NB)	2	BFTX0410T8L	TRX08
SCT R1212-16	●	12	12	120	12	12	18		1		
SCT R1616-16	●	16	16	120	16	16	18		1		

Holder (Left-Hand)

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Applicable Insert	Fig	Parts: Flat Head Screw	Parts: Wrench
SCT L1010	●	10	10	120	10	10	15	CT L05○○○○(-NB) CT L12○○○○(-NB)	1	BFTX0410T8R	TRX08
SCT L1212	●	12	12	120	12	12	15		1		
SCT L1616	●	16	16	120	16	16	15		1		
SCT L1010-16	●	10	10	120	10	10	18	CT L16○○○○(-NB)	2	BFTX0410T8R	TRX08
SCT L1212-16	●	12	12	120	12	12	18		1		
SCT L1616-16	●	16	16	120	16	16	18		1		

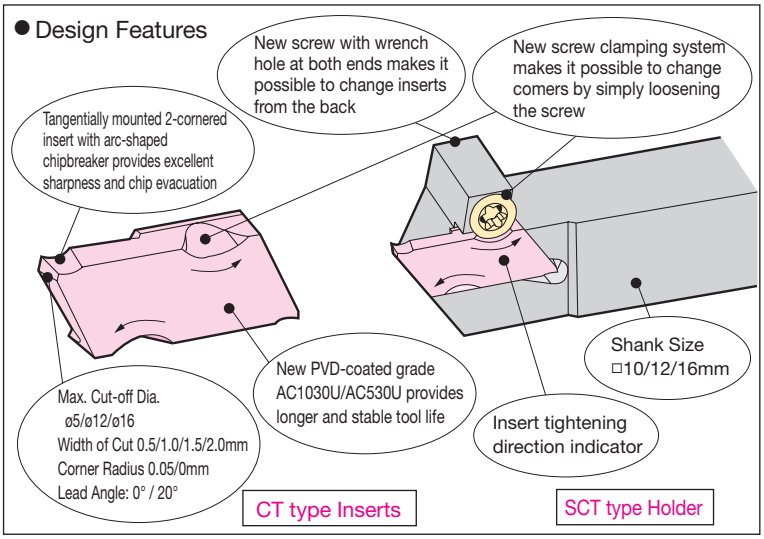
Features

● **Simple Indexable Inserts**
New clamping system makes it possible to change corners simply by loosening the screw from the back

● **High Quality Surface Finish**
Excellent chip removal, leaves only a small pip at center of the work face.

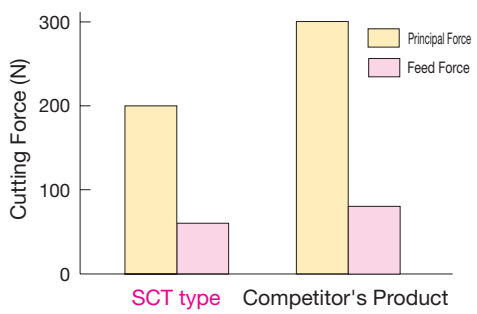
● **Long, Stable Tool Life**
PVD Coating
Long, stable tool life with AC1030U/AC530U

● Design Features



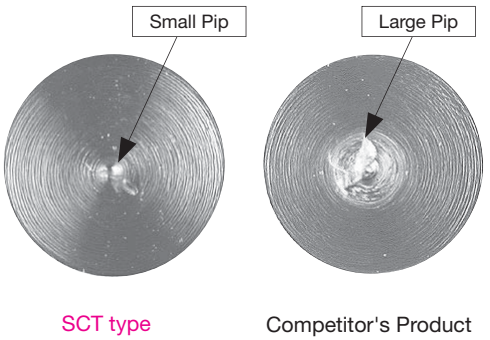
Cutting Performance

● Cutting Force



Work Material: S45C (ø10mm) Width of Cut: 1.5mm
vc = 60m/min, f = 0.06mm/rev Wet

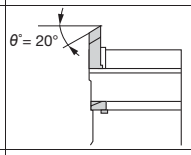
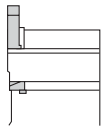
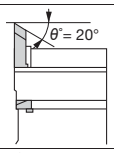
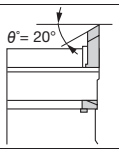
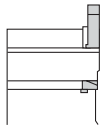
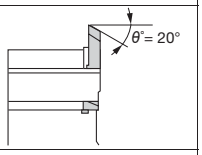
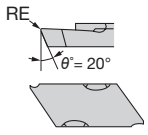
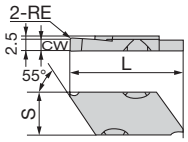
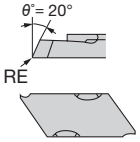
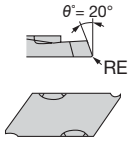
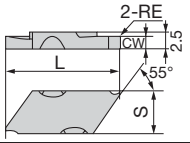
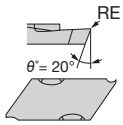
● Surface Finish



Work Material: SUS430 (ø8mm) Width of Cut: 1.0mm (Handed)
vc = 45m/min, f = 0.02mm/rev Wet

SCT type

Insert Mounting Status and Dimensions (Figure shows insert with chipbreaker)

Holder Feed Direction	For Right-handed Holder (SCTR)			For Left-handed Holder (SCTL)		
Insert Cat. No.	CTR○○R	CTR○○N	CTR○○L	CTL○○R	CTL○○N	CTL○○L
Holder Mounting Status						
Insert Shape and Dimensions						

Insert (For Right-handed Holders) (Coated Carbide)

Dimensions (mm)

Cat. No.	AC1030U			AC530U			Max. Cut-off Dia.	Width of Cut	Corner Radius	Overall Length	Thickness	Chipbreaker	Applicable Holder
	R	N	L	R	N	L		CW	RE	L	S		
CTR 050505 R/N/L	●	●	●	●	●	●	**5**	**0.5**	0.05	19	7	Yes	SCT R1010 SCT R1212 SCT R1616
CTR 050500 R/N/L	●	●		●	●		**5**	**0.5**	0	19	7	Yes	
CTR 121005 R/N/L	●	●	●	●	●	●	**12**	**1.0**	0.05	19	7	Yes	
CTR 121505 R/N/L	●	●	●	●	●	●	**12**	**1.5**	0.05	19	7	Yes	
CTR 122005 R/N/L	●	●		●	●		**12**	**2.0**	0.05	19	7	Yes	
CTR 121000 R/N/L	●	●		●	●		**12**	**1.0**	0	19	7	Yes	
CTR 121500 R/N/L	●	●		●	●		**12**	**1.5**	0	19	7	Yes	
CTR 122000 R/N/L	●	●		●	●		**12**	**2.0**	0	19	7	Yes	
CTR 161005 R/N/L							**16**	**1.0**	0.05	23.1	8.3	Yes	SCT R1010-16 SCT R1212-16 SCT R1616-16
CTR 161505 R/N/L	●	●		●	●		**16**	**1.5**	0.05	23.1	8.3	Yes	
CTR 162005 R/N/L	●	●	●	●	●	●	**16**	**2.0**	0.05	23.1	8.3	Yes	
CTR 161000 R/N/L							**16**	**1.0**	0	23.1	8.3	Yes	
CTR 161500 R/N/L	●	●		●	●		**16**	**1.5**	0	23.1	8.3	Yes	
CTR 162000 R/N/L	●	●	●	●	●	●	**16**	**2.0**	0	23.1	8.3	Yes	
CTR 050500 R/N/L-NB							**5**	**0.5**	0	19	7	No	SCT R1010 SCT R1212 SCT R1616
CTR 121000 R/N/L-NB	●			●			**12**	**1.0**	0	19	7	No	
CTR 121500 R/N/L-NB	●			●			**12**	**1.5**	0	19	7	No	
CTR 122000 R/N/L-NB	●			●			**12**	**2.0**	0	19	7	No	
CTR 161000 R/N/L-NB							**16**	**1.0**	0	23.1	8.3	No	SCT R1010-16 SCT R1212-16 SCT R1616-16
CTR 161500 R/N/L-NB							**16**	**1.5**	0	23.1	8.3	No	
CTR 162000 R/N/L-NB	●			●			**16**	**2.0**	0	23.1	8.3	No	

Inserts (For Left-handed Holders) (Coated Carbide)

Dimensions (mm)

Cat. No.	AC1030U			AC530U			Max. Cut-off Dia.	Width of Cut	Corner Radius	Overall Length	Thickness	Chipbreaker	Applicable Holder
	R	N	L	R	N	L		CW	RE	L	S		
CTL 050505 R/N/L	●	●		●	●		**5**	**0.5**	0.05	19	7	Yes	SCT L1010 SCT L1212 SCT L1616
CTL 050500 R/N/L	●	●		●	●		**5**	**0.5**	0	19	7	Yes	
CTL 121005 R/N/L	●	●	●	●	●	●	**12**	**1.0**	0.05	19	7	Yes	
CTL 121505 R/N/L	●	●	●	●	●	●	**12**	**1.5**	0.05	19	7	Yes	
CTL 122005 R/N/L	●	●		●	●		**12**	**2.0**	0.05	19	7	Yes	
CTL 121000 R/N/L	●	●		●	●		**12**	**1.0**	0	19	7	Yes	
CTL 121500 R/N/L	●	●		●	●		**12**	**1.5**	0	19	7	Yes	
CTL 122000 R/N/L	●	●		●	●		**12**	**2.0**	0	19	7	Yes	
CTL 161005 R/N/L							**16**	**1.0**	0.05	23.1	8.3	Yes	SCT L1010-16 SCT L1212-16 SCT L1616-16
CTL 161505 R/N/L	●	●		●	●		**16**	**1.5**	0.05	23.1	8.3	Yes	
CTL 162005 R/N/L	●	●	●	●	●	●	**16**	**2.0**	0.05	23.1	8.3	Yes	
CTL 161000 R/N/L							**16**	**1.0**	0	23.1	8.3	Yes	
CTL 161500 R/N/L	●	●		●	●		**16**	**1.5**	0	23.1	8.3	Yes	
CTL 162000 R/N/L	●	●		●	●		**16**	**2.0**	0	23.1	8.3	Yes	
CTL 050500 R/N/L-NB							**5**	**0.5**	0	19	7	No	SCT L1010 SCT L1212 SCT L1616
CTL 121000 R/N/L-NB							**12**	**1.0**	0	19	7	No	
CTL 121500 R/N/L-NB							**12**	**1.5**	0	19	7	No	
CTL 122000 R/N/L-NB							**12**	**2.0**	0	19	7	No	
CTL 161000 R/N/L-NB							**16**	**1.0**	0	23.1	8.3	No	SCT L1010-16 SCT L1212-16 SCT L1616-16
CTL 161500 R/N/L-NB							**16**	**1.5**	0	23.1	8.3	No	
CTL 162000 R/N/L-NB							**16**	**2.0**	0	23.1	8.3	No	

GNDM type / GNDL type

Cut-off | Zero Offset

SumiSmall

GNDM

Cut-off (For Small Lathes)

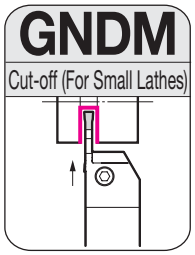


Fig 1

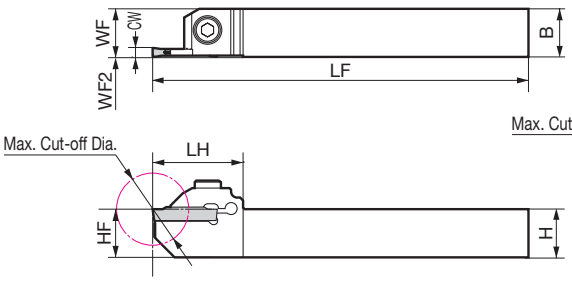


Fig 2

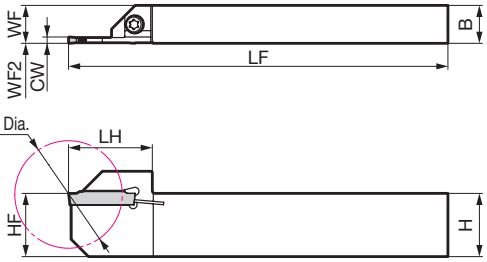


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Offset WF2	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Cap Screw	N·m	Wrench
														BX0515 / BFTX0414		LT15-10 / LH040
GNDM R/L1616JX-1.2508	●	●	16	16	120	(16)	16	26	0	**1.25**	**16**	GCM N125005-GF	1			
GNDM R/L1616JX-1.510	●	●	16	16	120	(16)	16	26	0	**1.50**	**20**	GCM N150005-GF	1			
GNDM R/L1616JX-212	●	●	16	16	120	(16)	16	30	0	**2.00**	**24**	GC□ □20○○-□□	1	BX0515	**4.0**	LH040
GNDM R/L1616JX-312	●	●	16	16	120	(16)	16	30	0	**3.00**	**24**	GC□ □30○○-□□	1			
GNDM R/L2012JX-217	●	●	20	12	120	(12)	20	26.5	0	**2.00**	**34**	GC□ □20○○-□□	2			
GNDM R/L2012JX-317	●	●	20	12	120	(12)	20	26.5	0	**3.00**	**34**	GC□ □30○○-□□	2	BFTX0414	**3.0**	LT15-10

Select holders and inserts with matching width of cut (CW).
Refer to F81 for applicable inserts.

Cut-off | Zero Offset

SumiSmall

GNDL

Cut-off (For Small Lathes)

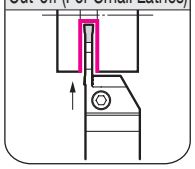


Fig 1

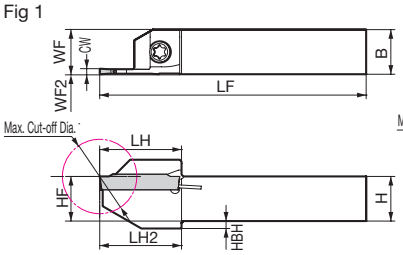


Fig 2

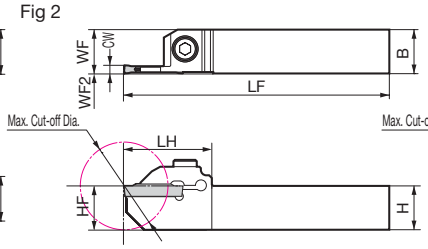


Fig 3

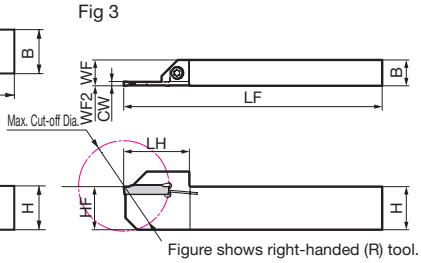


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Step HBH	Head LH	Head LH2	Offset WF2	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Flat Head Screw / Cap Screw	N·m	Wrench
																BFTX0412N / BFTX0414 / BX0515		LT15-10 / LH040
GNDL R/L1010JX-1.2510	●	●	10	10	120	(10)	10	2.0	18	18.3	0	**1.25**	**20**	GCM N125005-GF	1			
GNDL R/L1010JX-1.510	●	●	10	10	120	(10)	10	2.0	18	18.3	0	**1.50**	**20**	GCM N150005-GF	1			
GNDL R/L1010JX-210	●	●	10	10	120	(10)	10	2.0	22	22.3	0	**2.00**	**20**	GC□ □20○○-□□	1			
GNDL R/L1010JX-310	●	●	10	10	120	(10)	10	2.0	22	22.3	0	**3.00**	**20**	GC□ □30○○-□□	1			
GNDL R/L1212JX-1.2512	●	●	12	12	120	(12)	12	2.0	19	19.3	0	**1.25**	**24**	GCM N125005-GF	1			
GNDL R/L1212JX-1.512	●	●	12	12	120	(12)	12	2.0	19	19.3	0	**1.50**	**24**	GCM N150005-GF	1			
GNDL R/L1212JX-212.5	●	●	12	12	120	(12)	12	2.0	22	22.3	0	**2.00**	**25**	GC□ □20○○-□□	1	BFTX0412N	**3.0**	LT15-10
GNDL R/L1212JX-312.5	●	●	12	12	120	(12)	12	2.0	22	22.3	0	**3.00**	**25**	GC□ □30○○-□□	1			
GNDL R/L1616JX-1.2512.5	●	●	16	16	120	(16)	16	—	28	—	0	**1.25**	**20**	GCM N125005-GF	2			
GNDL R/L1616JX-1.512.5	●	●	16	16	120	(16)	16	—	28	—	0	**1.50**	**25**	GCM N150005-GF	2			
GNDL R/L1616JX-216	●	●	16	16	120	(16)	16	—	32	—	0	**2.00**	**32**	GC□ □20○○-□□	2	BX0515	**4.0**	LH040
GNDL R/L1616JX-316	●	●	16	16	120	(16)	16	—	32	—	0	**3.00**	**32**	GC□ □30○○-□□	2			
GNDL R/L2012JX-221	●	●	20	12	120	(12)	20	—	30.5	—	0	**2.00**	**42**	GC□ □20○○-□□	3			
GNDL R/L2012JX-321	●	●	20	12	120	(12)	20	—	30.5	—	0	**3.00**	**42**	GC□ □30○○-□□	3	BFTX0414	**3.0**	LT15-10

Select holders and inserts with matching width of cut (CW).
Refer to F81 for applicable inserts.

N·m Recommended Tightening Torque (N·m)

GNDM type / GNDL type

Inserts for GNDM type (For Small Lathes)/GNDL type (For Small Lathes) (Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

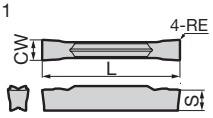
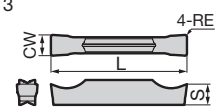


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2	5	1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6	5	3
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

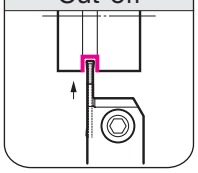
Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDM-J type / GNDL-J type

GNDM-J

Cut-off



Cut-off | Zero Offset | Internal Coolant

Fig 1

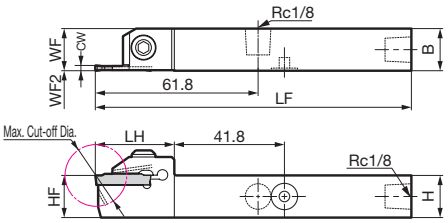


Fig 2

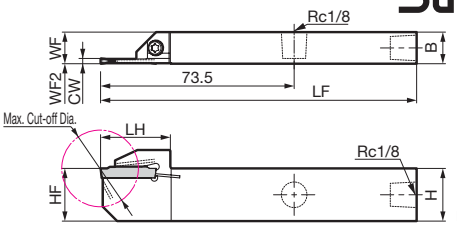
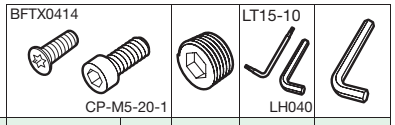


Figure shows right-handed (R) tool.

SumiSmall

■ Parts



■ Holder

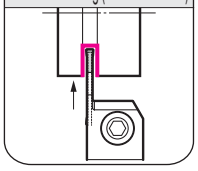
Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Offset WF2	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Flat Head Screw / Cap Screw	N·m	Plug	Top Hex Wrench	Bottom Hex Wrench
GNDM R/L1616JX-212J	●	●	16	16	120	(16)	16	30.0	0	**2.0**	**24**	GC□ □20○○-□□	1	CP-M5-20-1	**5.0**	XP02	LH040	LH025
GNDM R/L1616JX-312J	●	●	16	16	120	(16)	16	30.0	0	**3.0**	**24**	GC□ □30○○-□□	1					
GNDM R/L2012JX-217J	●	●	20	12	120	(12)	20	26.5	0	**2.0**	**34**	GC□ □20○○-□□	2	BFTX0414	**3.0**	XP02	LT15-10	—
GNDM R/L2012JX-317J	●	●	20	12	120	(12)	20	26.5	0	**3.0**	**34**	GC□ □30○○-□□	2					

Select holders and inserts with matching width of cut (CW). Refer to F83 for applicable inserts.

GNDL-J

External Grooving (for Small Lathes)



Cut-off | Zero Offset | Internal Coolant

Fig 1

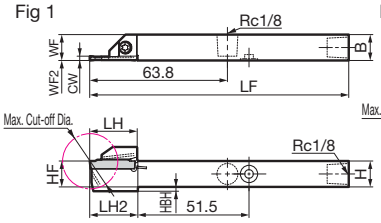


Fig 2

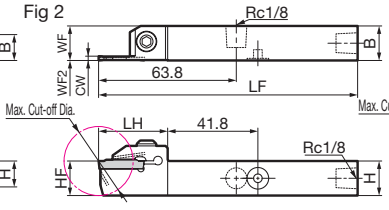


Fig 3

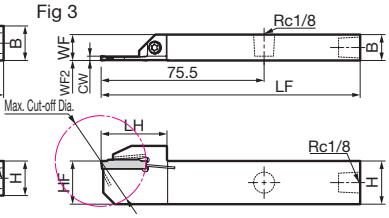
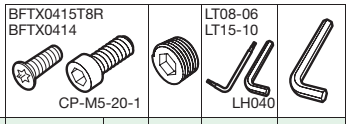


Figure shows right-handed (R) tool.

SumiSmall

■ Parts



■ Holder

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Step HBH	Head LH	Head LH2	Offset WF2	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Flat Head Screw / Cap Screw	N·m	Plug	Top Hex Wrench	Bottom Hex Wrench
GNDL R/L1212JX-212.5J	●	●	12	12	120	(12)	12	2.0	22.0	22.3	0	**2.0**	**25**	GC□ □20○○-□□	1	BFTX0415T8R	**1.5**	XP02	LT08-06	←
GNDL R/L1212JX-312.5J	●	●	12	12	120	(12)	12	2.0	22.0	22.3	0	**3.0**	**25**	GC□ □30○○-□□	1					
GNDL R/L1616JX-216J	●	●	16	16	120	(16)	16	—	32.0	—	0	**2.0**	**32**	GC□ □20○○-□□	2	CP-M5-20-1	**5.0**	XP02	LH040	LH025
GNDL R/L1616JX-316J	●	●	16	16	120	(16)	16	—	32.0	—	0	**3.0**	**32**	GC□ □30○○-□□	2					
GNDL R/L2012JX-221J	●	●	20	12	120	(12)	20	—	30.5	—	0	**2.0**	**42**	GC□ □20○○-□□	3	BFTX0414	**3.0**	XP02	LT15-10	—
GNDL R/L2012JX-321J	●	●	20	12	120	(12)	20	—	30.5	—	0	**3.0**	**42**	GC□ □30○○-□□	3					

Select holders and inserts with matching width of cut (CW). Refer to F83 for applicable inserts.

Fig 1

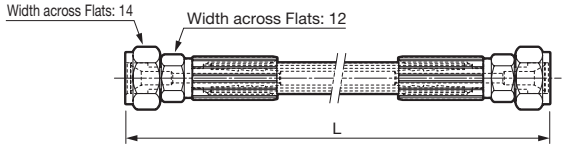


Fig 1

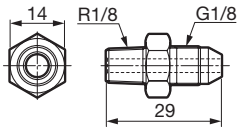
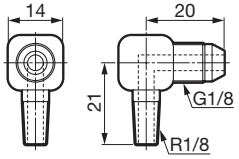


Fig 2



Parts (Hose)

Dimensions (mm)

Cat. No.	Stock	L	Screw Standard	Screw Standard	Fig
J-HOSE-G1/8-G1/8-200	●	200	G1/8	G1/8	1
J-HOSE-G1/8-G1/8-300	●	300	G1/8	G1/8	1

Hoses are sold separately.

Piping Method for Hoses and Connectors F23

Parts (Connector)

Dimensions (mm)

Cat. No.	Stock	Screw Standard	Screw Standard	Fig
J-G1/8-R1/8-00	●	G1/8	R1/8	1
J-G1/8-R1/8-90	●	G1/8	R1/8	2

Connectors are sold separately.

Piping Method for Hoses and Connectors F23

N·m Recommended Tightening Torque (N·m)

GNDM-J type / GNDL-J type

Inserts for GNDM-J type (For Small Lathes)/GNDL-J type (For Small Lathes) (Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

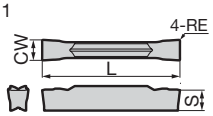
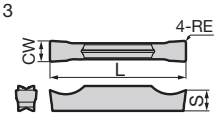


Fig 2 (Figure shows right-handed (R) tools.)

Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	**3.0**	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	**3.0**	±0.03	0.4	21.1	3.8		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	**2.0**	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	**3.0**	±0.03	0.2	21.1	3.8	5	1
N3004-ML	●	●		●	●	●		●	●	**3.0**	±0.03	0.4	21.1	3.8		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	**2.0**	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	**3.0**	±0.03	0.2	21.1	3.8	5	1
N3004-GG		●	●		●	●	●	●	—	**3.0**	±0.03	0.4	21.1	3.8		1
GCM N2002-GL		●	●		●	●	●	●	—	**2.0**	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	**2.0**	±0.03	0.4	21.1	3.6	5	1
GCM N3002-GL		●	●		●	●	●	●	—	**3.0**	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	**3.0**	±0.03	0.4	21.1	3.8		1
GCM N2002-GF	—	—	—	—	●	●		●	●	**2.0**	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	**2.0**	±0.03	0.4	21.1	3.6	5	1
GCM N3002-GF		●	●		●	●	●	●	●	**3.0**	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	**3.0**	±0.03	0.4	21.1	3.8		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	**2.0**	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	**2.0**	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	**3.0**	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	**3.0**	±0.03	0.2	21.3	3.8		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	**2.0**	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	**2.0**	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	**3.0**	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	**3.0**	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	**2.0**	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	**2.0**	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	**3.0**	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	**3.0**	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								**2.0**	±0.025	0.2	21.1	3.6	5	3
N3002-GA	●								**3.0**	±0.025	0.2	21.1	3.8		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDS type

External

* For traverse cutting (groove expansion), use a multi-functional or profiling insert.

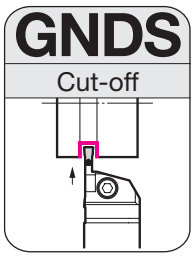


Fig 1

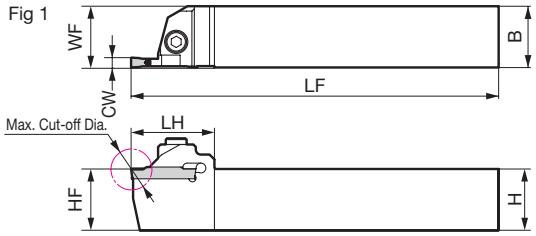


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Cap Screw	N·m	Wrench
GNDS R/L2020K-206	●	●	20	20	125	20	20	30	**2.0**	**12**	GC□ □20○○-□□	1			
GNDS R/L2020K-306	●	●	20	20	125	20	20	30	**3.0**	**12**	GC□ □30○○-□□	1			
GNDS R/L2020K-410	●	●	20	20	125	20	20	34	**4.0**	**20**	GC□ □40○○-□□	1	BX0520	**5.0**	LH040
GNDS R/L2020K-510	●	●	20	20	125	20	20	34	**5.0**	**20**	GC□ N50○○-□□	1			
GNDS R/L2020K-610	●	●	20	20	125	20	20	34	**6.0**	**20**	GC□ N60○○-□□	1			
GNDS R/L2525M-206	●	●	25	25	150	25	25	30	**2.0**	**12**	GC□ □20○○-□□	1			
GNDS R/L2525M-306	●	●	25	25	150	25	25	30	**3.0**	**12**	GC□ □30○○-□□	1			
GNDS R/L2525M-410	●	●	25	25	150	25	25	34	**4.0**	**20**	GC□ □40○○-□□	1	BX0520	**5.0**	LH040
GNDS R/L2525M-510	●	●	25	25	150	25	25	34	**5.0**	**20**	GC□ N50○○-□□	1			
GNDS R/L2525M-610	●	●	25	25	150	25	25	34	**6.0**	**20**	GC□ N60○○-□□	1			

Select holders and inserts with matching width of cut (CW). Refer to F85 for applicable inserts.

N·m Recommended Tightening Torque (N·m)

GNDS type

Inserts for GNDS type

(Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

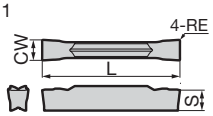
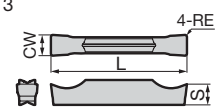


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0	5	1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N2002-ML	—	—	—	—	●	●	●	●	●	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0	5	1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8	5	2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8	5	2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6		3
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		3
GCG N4004-GA	●								4.0	±0.025	0.4	26.4	4.0	5	3
N5004-GA	●								5.0	±0.025	0.4	26.4	4.1		3
N6004-GA	●								6.0	±0.025	0.4	26.4	4.5		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDM type

Cut-off

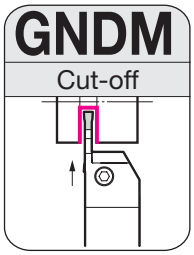


Fig 1

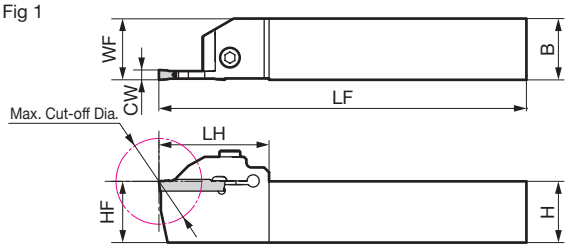


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Flat Head Screw (BX0520 / BX0620)	Flat Head Screw (N·m)	Wrench
GNDM R/L2020K-1.2510	●	●	20	20	125	20	20	34.0	**1.25**	**20**	GCM N125005-GF	1			
GNDM R/L2020K-1.510	●	●	20	20	125	20	20	34.0	**1.50**	**20**	GCM N150005-GF	1			
GNDM R/L2020K-210	●	●	20	20	125	20	20	33.6	**2.00**	**20**	GC□ □20○○-□□	1			
GNDM R/L2020K-312	●	●	20	20	125	20	20	36.6	**3.00**	**24**	GC□ □30○○-□□	1	BX0520	**5.0**	LH040
GNDM R/L2020K-418	●	●	20	20	125	20	20	45.0	**4.00**	**36**	GC□ □40○○-□□	1			
GNDM R/L2020K-518	●	●	20	20	125	20	20	45.0	**5.00**	**36**	GC□ N50○○-□□	1			
GNDM R/L2020K-618	●	●	20	20	125	20	20	45.0	**6.00**	**36**	GC□ N60○○-□□	1			
GNDM R/L2525M-1.2510	●	●	25	25	150	25	25	36.0	**1.25**	**20**	GCM N125005-GF	1			
GNDM R/L2525M-1.510	●	●	25	25	150	25	25	36.0	**1.50**	**20**	GCM N150005-GF	1			
GNDM R/L2525M-210	●	●	25	25	150	25	25	33.6	**2.00**	**20**	GC□ □20○○-□□	1			
GNDM R/L2525M-312	●	●	25	25	150	25	25	36.6	**3.00**	**24**	GC□ □30○○-□□	1	BX0520	**5.0**	LH040
GNDM R/L2525M-418	●	●	25	25	150	25	25	45.0	**4.00**	**36**	GC□ □40○○-□□	1			
GNDM R/L2525M-518	●	●	25	25	150	25	25	45.0	**5.00**	**36**	GC□ N50○○-□□	1			
GNDM R/L2525M-618	●	●	25	25	150	25	25	45.0	**6.00**	**36**	GC□ N60○○-□□	1			
GNDM R/L3225P-312			32	25	170	25	32	36.6	**3.00**	**24**	GC□ □30○○-□□	1			
GNDM R/L3225P-418			32	25	170	25	32	45.0	**4.00**	**36**	GC□ □40○○-□□	1	BX0520	**5.0**	LH040
GNDM R/L3225P-518			32	25	170	25	32	45.0	**5.00**	**36**	GC□ N50○○-□□	1			
GNDM R/L3225P-618			32	25	170	25	32	45.0	**6.00**	**36**	GC□ N60○○-□□	1			
GNDM R/L3225P-718			32	25	170	25	32	50.0	**7.00**	**36**	GCM N70○○-□□	1	BX0620	**6.0**	LH050
GNDM R/L3225P-818			32	25	170	25	32	50.0	**8.00**	**36**	GCM N80○○-□□	1			
GNDM R/L3232P-312	●	●	32	32	170	32	32	36.6	**3.00**	**24**	GC□ □30○○-□□	1			
GNDM R/L3232P-418	●	●	32	32	170	32	32	45.0	**4.00**	**36**	GC□ □40○○-□□	1			
GNDM R/L3232P-518	●	●	32	32	170	32	32	45.0	**5.00**	**36**	GC□ N50○○-□□	1	BX0620	**6.0**	LH050
GNDM R/L3232P-618	●	●	32	32	170	32	32	45.0	**6.00**	**36**	GC□ N60○○-□□	1			
GNDM R/L3232P-718	●	●	32	32	170	32	32	50.0	**7.00**	**36**	GCM N70○○-□□	1			
GNDM R/L3232P-818	●	●	32	32	170	32	32	50.0	**8.00**	**36**	GCM N80○○-□□	1			

Select holders and inserts with matching width of cut (CW). The maximum cut-off diameter indicated above is for inserts with RE = 0.2mm.
Refer to F87 for applicable inserts.

N·m Recommended Tightening Torque (N·m)

GNDM type

Inserts for GNDM type

(Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

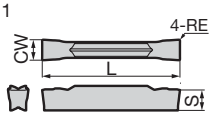
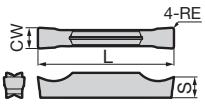


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N7004-MG	●	●		●	●	●		●	—	7.0	±0.04	0.4	28.8	5.5		1
N7008-MG	●	●	●	●	●	●	●	●	—	7.0	±0.04	0.8	28.8	5.5		1
GCM N8004-MG	●	●		●	●	●		●	—	8.0	±0.04	0.4	28.8	6.0		1
N8008-MG	●	●	●	●	●	●	●	●	—	8.0	±0.04	0.8	28.8	6.0		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N7004-ML	●	●	●	●	●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
N7008-ML	●	●		●	●	●		●	—	7.0	±0.04	0.8	28.8	5.5		1
GCM N8004-ML	●	●	●	●	●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
N8008-ML	●	●		●	●	●		●	—	8.0	±0.04	0.8	28.8	6.0		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.										Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7004-GG		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8004-GG		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7004-GL		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8004-GL		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2	5	1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7002-GF		●	●		●	●	●	●	—	7.0	±0.04	0.2	28.8	5.5		1
N7004-GF		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8002-GF		●	●		●	●	●	●	—	8.0	±0.04	0.2	28.8	6.0		1
N8004-GF		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6	5	3
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		3
GCG N4004-GA	●								4.0	±0.025	0.4	26.4	4.0		3
N5004-GA	●								5.0	±0.025	0.4	26.4	4.1		3
N6004-GA	●								6.0	±0.025	0.4	26.4	4.5		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDM-J type

Cut-off | Internal Coolant

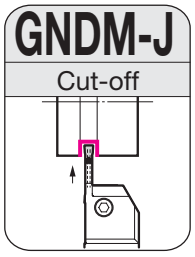


Fig 1

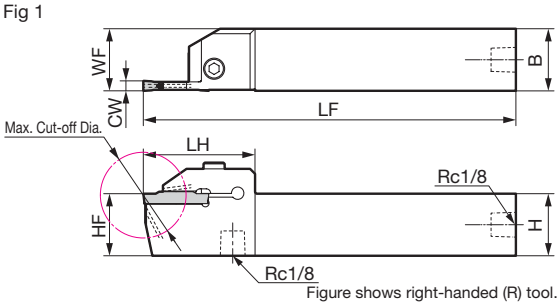


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Cap Screw	Cap Screw N·m	Plug	Wrench
GNDM R/L2020K-210J	●	●	20	20	125	20	20	33.6	**2.00**	**20**	GC□ □20○○-□□	1				
R/L2020K-312J	●	●	20	20	125	20	20	36.6	**3.00**	**24**	GC□ □30○○-□□	1				
R/L2020K-418J	●	●	20	20	125	20	20	45	**4.00**	**36**	GC□ □40○○-□□	1	BX0520	**6.0**	XP02	LH040
R/L2020K-518J	●	●	20	20	125	20	20	45	**5.00**	**36**	GC□ N50○○-□□	1				
R/L2020K-618J	●	●	20	20	125	20	20	45	**6.00**	**36**	GC□ N60○○-□□	1				
GNDM R/L2525K-210J	●	●	25	25	125	25	25	33.6	**2.00**	**20**	GC□ □20○○-□□	1				
R/L2525K-312J	●	●	25	25	125	25	25	36.6	**3.00**	**24**	GC□ □30○○-□□	1				
R/L2525K-418J	●	●	25	25	125	25	25	45	**4.00**	**36**	GC□ □40○○-□□	1	BX0520	**6.0**	XP02	LH040
R/L2525K-518J	●	●	25	25	125	25	25	45	**5.00**	**36**	GC□ N50○○-□□	1				
R/L2525K-618J	●	●	25	25	125	25	25	45	**6.00**	**36**	GC□ N60○○-□□	1				

Select holders and inserts with matching width of cut (CW). The maximum cut-off diameter indicated above is for inserts with RE = 0.2mm.
Refer to F89 for applicable inserts.

Fig 1

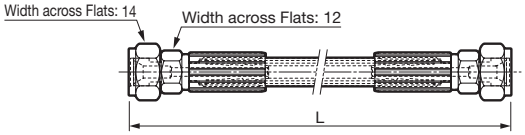


Fig 1

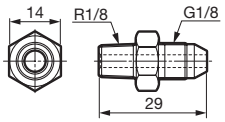
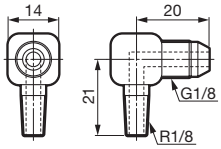


Fig 2



Parts (Hose)

Dimensions (mm)

Cat. No.	Stock	L	Screw Standard	Screw Standard	Fig
J-HOSE-G1/8-G1/8-200	●	200	G1/8	G1/8	1
J-HOSE-G1/8-G1/8-300	●	300	G1/8	G1/8	1

Hoses are sold separately.

Piping Method for Hoses and Connectors F23

Parts (Connector)

Dimensions (mm)

Cat. No.	Stock	Screw Standard	Screw Standard	Fig
J-G1/8-R1/8-00	●	G1/8	R1/8	1
J-G1/8-R1/8-90	●	G1/8	R1/8	2

Connectors are sold separately.

Piping Method for Hoses and Connectors F23

N·m Recommended Tightening Torque (N·m)

GNDM-J type

Inserts for GNDM-J type

(Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

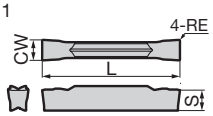
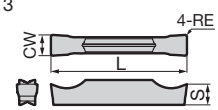


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N2002-ML	—	—	—	—	●	●	●	●	●	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6	5	1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6	5	3
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		3
GCG N4004-GA	●								4.0	±0.025	0.4	26.4	4.0		3
N5004-GA	●								5.0	±0.025	0.4	26.4	4.1		3
N6004-GA	●								6.0	±0.025	0.4	26.4	4.5		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDL type

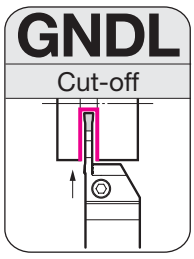


Fig 1

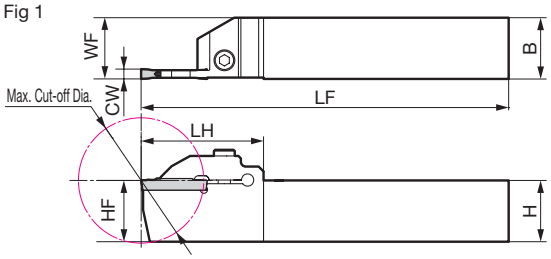


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Cap Screw (BX0520 / BX0620)	Cap Screw N·m	Wrench
GNDL R/L2020K-1.2516	●	●	20	20	125	20	20	38.0	**1.25**	**32**	GCM N125005-GF	1	BX0520	**5.0**	LH040
GNDL R/L2020K-1.516	●	●	20	20	125	20	20	38.0	**1.50**	**32**	GCM N150005-GF	1			
GNDL R/L2020K-220	●	●	20	20	125	20	20	44.5	**2.00**	**40**	GC□ □20○○-□□	1			
GNDL R/L2020K-320	●	●	20	20	125	20	20	44.5	**3.00**	**40**	GC□ □30○○-□□	1			
GNDL R/L2020K-425	●	●	20	20	125	20	20	50.0	**4.00**	**50**	GC□ □40○○-□□	1			
GNDL R/L2020K-525	●	●	20	20	125	20	20	50.0	**5.00**	**50**	GC□ N50○○-□□	1			
GNDL R/L2020K-625	●	●	20	20	125	20	20	50.0	**6.00**	**50**	GC□ N60○○-□□	1			
GNDL R/L2525M-1.2516	●	●	25	25	150	25	25	40.0	**1.25**	**32**	GCM N125005-GF	1	BX0520	**5.0**	LH040
GNDL R/L2525M-1.516	●	●	25	25	150	25	25	40.0	**1.50**	**32**	GCM N150005-GF	1			
GNDL R/L2525M-220	●	●	25	25	150	25	25	44.5	**2.00**	**40**	GC□ □20○○-□□	1			
GNDL R/L2525M-320	●	●	25	25	150	25	25	44.5	**3.00**	**40**	GC□ □30○○-□□	1			
GNDL R/L2525M-425	●	●	25	25	150	25	25	50.0	**4.00**	**50**	GC□ □40○○-□□	1			
GNDL R/L2525M-525	●	●	25	25	150	25	25	50.0	**5.00**	**50**	GC□ N50○○-□□	1			
GNDL R/L2525M-625	●	●	25	25	150	25	25	50.0	**6.00**	**50**	GC□ N60○○-□□	1			
GNDL R/L3225P-320			32	25	170	25	32	44.5	**3.00**	**40**	GC□ □30○○-□□	1	BX0520	**5.0**	LH040
GNDL R/L3225P-425			32	25	170	25	32	50.0	**4.00**	**50**	GC□ □40○○-□□	1			
GNDL R/L3225P-525			32	25	170	25	32	50.0	**5.00**	**50**	GC□ N50○○-□□	1			
GNDL R/L3225P-625			32	25	170	25	32	50.0	**6.00**	**50**	GC□ N60○○-□□	1			
GNDL R/L3225P-725			32	25	170	25	32	50.0	**7.00**	**50**	GCM N70○○-□□	1	BX0620	**6.0**	LH050
GNDL R/L3225P-825			32	25	170	25	32	50.0	**8.00**	**50**	GCM N80○○-□□	1			
GNDL R/L3232P-320	●	●	32	32	170	32	32	44.5	**3.00**	**40**	GC□ □30○○-□□	1	BX0620	**6.0**	LH050
GNDL R/L3232P-425	●	●	32	32	170	32	32	50.0	**4.00**	**50**	GC□ □40○○-□□	1			
GNDL R/L3232P-525	●	●	32	32	170	32	32	50.0	**5.00**	**50**	GC□ N50○○-□□	1			
GNDL R/L3232P-625	●	●	32	32	170	32	32	50.0	**6.00**	**50**	GC□ N60○○-□□	1			
GNDL R/L3232P-725	●	●	32	32	170	32	32	50.0	**7.00**	**50**	GCM N70○○-□□	1			
GNDL R/L3232P-825	●	●	32	32	170	32	32	50.0	**8.00**	**50**	GCM N80○○-□□	1			

Select holders and inserts with matching width of cut (CW). The maximum cut-off diameter indicated above is for inserts with RE = 0.2mm.
Refer to F91 for applicable inserts.

N·m Recommended Tightening Torque (N·m)

GNDL type

Inserts for GNDL type

(Coated Carbide/ Cermet/ Cemented Carbide)

Fig 1

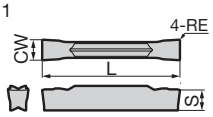
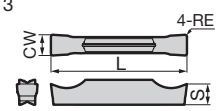


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8	5	1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N7004-MG	●	●		●	●	●		●	—	7.0	±0.04	0.4	28.8	5.5		1
N7008-MG	●	●	●	●	●	●	●	●	—	7.0	±0.04	0.8	28.8	5.5		1
GCM N8004-MG	●	●		●	●	●		●	—	8.0	±0.04	0.4	28.8	6.0		1
N8008-MG	●	●	●	●	●	●	●	●	—	8.0	±0.04	0.8	28.8	6.0		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0		1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N7004-ML	●	●	●	●	●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
N7008-ML	●	●		●	●	●		●	—	7.0	±0.04	0.8	28.8	5.5		1
GCM N8004-ML	●	●	●	●	●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
N8008-ML	●	●		●	●	●		●	—	8.0	±0.04	0.8	28.8	6.0		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.										Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7004-GG		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8004-GG		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6	5	1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7004-GL		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8004-GL		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1
GCM N125005-GF	—	—	—	—	—	—	—	●	—	1.25	±0.03	0.05	17.4	3.2	5	1
GCM N150005-GF	—	—	—	—	—	—	—	●	—	1.5	±0.03	0.05	17.8	3.7		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0		1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N7002-GF		●	●		●	●	●	●	—	7.0	±0.04	0.2	28.8	5.5		1
N7004-GF		●	●		●	●	●	●	—	7.0	±0.04	0.4	28.8	5.5		1
GCM N8002-GF		●	●		●	●	●	●	—	8.0	±0.04	0.2	28.8	6.0		1
N8004-GF		●	●		●	●	●	●	—	8.0	±0.04	0.4	28.8	6.0		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6	5	2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6	5	2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6	5	3
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		3
GCG N4004-GA	●								4.0	±0.025	0.4	26.4	4.0		3
N5004-GA	●								5.0	±0.025	0.4	26.4	4.1		3
N6004-GA	●								6.0	±0.025	0.4	26.4	4.5		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 | Precautions for Use F22 | Recommended Cutting Conditions F19

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDL-J type

Cut-off | Internal Coolant

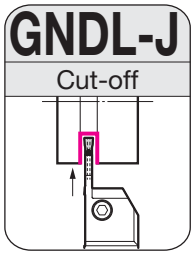


Fig 1

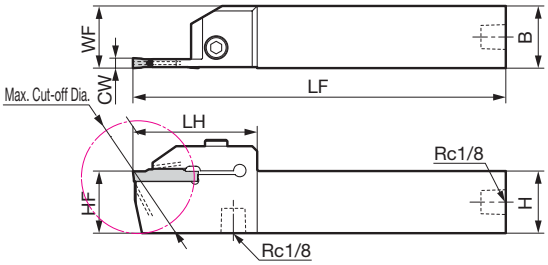


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Cap Screw	Cap Screw N·m	Plug	Wrench
GNDL R/L2020K-220J	●	●	20	20	125	20	20	44.5	**2.00**	**40**	GC□ □20○○-□□	1				
R/L2020K-320J	●	●	20	20	125	20	20	44.5	**3.00**	**40**	GC□ □30○○-□□	1				
R/L2020K-425J	●	●	20	20	125	20	20	50	**4.00**	**50**	GC□ □40○○-□□	1	BX0520	**6.0**	XP02	LH040
R/L2020K-525J	●	●	20	20	125	20	20	50	**5.00**	**50**	GC□ N50○○-□□	1				
R/L2020K-625J	●	●	20	20	125	20	20	50	**6.00**	**50**	GC□ N60○○-□□	1				
GNDL R/L2525K-220J	●	●	25	25	125	25	25	44.5	**2.00**	**40**	GC□ □20○○-□□	1				
R/L2525K-320J	●	●	25	25	125	25	25	44.5	**3.00**	**40**	GC□ □30○○-□□	1				
R/L2525K-425J	●	●	25	25	125	25	25	50	**4.00**	**50**	GC□ □40○○-□□	1	BX0520	**6.0**	XP02	LH040
R/L2525K-525J	●	●	25	25	125	25	25	50	**5.00**	**50**	GC□ N50○○-□□	1				
R/L2525K-625J	●	●	25	25	125	25	25	50	**6.00**	**50**	GC□ N60○○-□□	1				

Select holders and inserts with matching width of cut (CW). The maximum cut-off diameter indicated above is for inserts with RE = 0.2mm.
Refer to F93 for applicable inserts.

Fig 1

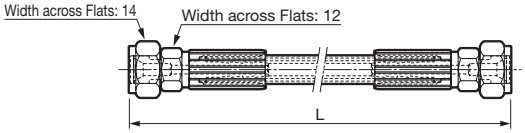


Fig 1

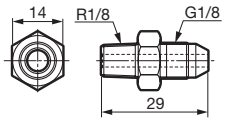
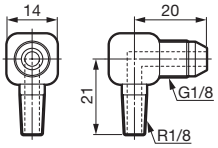


Fig 2



Parts (Hose)

Dimensions (mm)

Cat. No.	Stock	L	Screw Standard	Screw Standard	Fig
J-HOSE-G1/8-G1/8-200	●	200	G1/8	G1/8	1
J-HOSE-G1/8-G1/8-300	●	300	G1/8	G1/8	1

Hoses are sold separately.

Piping Method for Hoses and Connectors F23

Parts (Connector)

Dimensions (mm)

Cat. No.	Stock	Screw Standard	Screw Standard	Fig
J-G1/8-R1/8-00	●	G1/8	R1/8	1
J-G1/8-R1/8-90	●	G1/8	R1/8	2

Connectors are sold separately.

Piping Method for Hoses and Connectors F23

N·m Recommended Tightening Torque (N·m)

GNDL-J type

Inserts for GNDL-J type

(Coated Carbide / Cermet / Cemented Carbide)

Fig 1

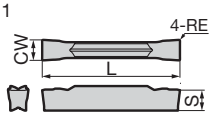
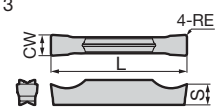


Fig 2 (Figure shows right-handed (R) tool.)

Fig 3



Grooving / Traverse Cutting

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N3002-MG	●	●		●	●	●		●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-MG	●	●	●	●	●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-MG	●	●		●	●	●		●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-MG	●	●		●	●	●		●	—	4.0	±0.03	0.4	26.4	4.0		1
N4008-MG	●	●	●	●	●	●	●	●	—	4.0	±0.03	0.8	26.4	4.0	5	1
GCM N5004-MG	●	●		●	●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-MG	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-MG	●	●		●	●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-MG	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.8	26.4	4.5		1
GCM N2002-ML	—	—	—	—	●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-ML	●	●	●	●	●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-ML	●	●		●	●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-ML	●	●		●	●	●		●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-ML	●	●	●	●	●	●	●	●	●	4.0	±0.03	0.4	26.4	4.0	5	1
N4008-ML	●	●		●	●	●		●	●	4.0	±0.03	0.8	26.4	4.0		1
GCM N5004-ML	●	●	●	●	●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
N5008-ML	●	●		●	●	●		●	—	5.0	±0.03	0.8	26.4	4.1		1
GCM N6004-ML	●	●	●	●	●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
N6008-ML	●	●		●	●	●		●	—	6.0	±0.03	0.8	26.4	4.5		1

Grooving / Cut-off

Dimensions (mm)

Cat. No.	AC8025P	AC8035P	AC830P	AC425K	AC5015S	AC5025S	AC520U	AC530U	T2500A	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
										Width of Cut	Tolerance	RE	L	S		
GCM N2002-GG		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
GCM N3002-GG		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GG		●	●		●	●	●	●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GG		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GG		●	●		●	●	●	●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GG		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GG		●	●		●	●	●	●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GG		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GG		●	●		●	●	●	●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GL		●	●		●	●	●	●	—	2.0	±0.03	0.2	21.1	3.6		1
N2004-GL		●			●	●		●	—	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GL		●	●		●	●	●	●	—	3.0	±0.03	0.2	21.1	3.8		1
N3004-GL		●			●	●		●	—	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GL		●	●		●	●	●	●	—	4.0	±0.03	0.2	26.4	4.0		1
N4004-GL		●			●	●		●	—	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GL		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GL		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GL		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GL		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1
GCM N2002-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.2	21.1	3.6		1
N2004-GF	—	—	—	—	●	●		●	●	2.0	±0.03	0.4	21.1	3.6		1
GCM N3002-GF		●	●		●	●	●	●	●	3.0	±0.03	0.2	21.1	3.8		1
N3004-GF		●			●	●		●	●	3.0	±0.03	0.4	21.1	3.8		1
GCM N4002-GF		●	●		●	●	●	●	●	4.0	±0.03	0.2	26.4	4.0		1
N4004-GF		●			●	●		●	●	4.0	±0.03	0.4	26.4	4.0	5	1
GCM N5002-GF		●	●		●	●	●	●	—	5.0	±0.03	0.2	26.4	4.1		1
N5004-GF		●			●	●		●	—	5.0	±0.03	0.4	26.4	4.1		1
GCM N6002-GF		●	●		●	●	●	●	—	6.0	±0.03	0.2	26.4	4.5		1
N6004-GF		●			●	●		●	—	6.0	±0.03	0.4	26.4	4.5		1

Cut-off (Handed Edge)

Dimensions (mm)

Cat. No.	AC8035P	AC830P	AC5015S	AC5025S	AC520U	AC530U	AC1030U	Lead Angle	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
								PSI	Width of Cut	Tolerance	RE	L	S		
GCM R2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
L2002-CG-05	●	●	●	●	●	●	—	5°	2.0	±0.03	0.2	21.1	3.6		2
GCM R3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8	5	2
L3002-CG-05	●	●	●	●	●	●	—	5°	3.0	±0.03	0.2	21.3	3.8		2
GCM R4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
L4002-CG-05	●	●	●	●	●	●	—	5°	4.0	±0.04	0.2	26.7	4.0		2
GCM R20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-10	—	—	●	●	—	—	●	10°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-10	—	—	●	●	—	—	●	10°	3.0	±0.08	0.03	22.4	3.8	5	2
GCM R20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
L20003-CF-15	—	—	●	●	—	—	●	15°	2.0	±0.08	0.03	22.4	3.6		2
GCM R30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2
L30003-CF-15	—	—	●	●	—	—	●	15°	3.0	±0.08	0.03	22.4	3.8		2

GCMR: Right-handed, GCML: Left-handed

Non-Ferrous Metals

Dimensions (mm)

Cat. No.	H10								Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
									Width of Cut	Tolerance	RE	L	S		
GCG N2002-GA	●								2.0	±0.025	0.2	21.1	3.6		3
N3002-GA	●								3.0	±0.025	0.2	21.1	3.8		3
GCG N4004-GA	●								4.0	±0.025	0.4	26.4	4.0	5	3
N5004-GA	●								5.0	±0.025	0.4	26.4	4.1		3
N6004-GA	●								6.0	±0.025	0.4	26.4	4.5		3

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	MG	Multi-functional / General-purpose
	ML	Multi-functional / Low-feed
Grooving / Cut-off	GG	Grooving / General-purpose
	GL	Grooving / Low-feed
	GF	Grooving / Low cutting force

Type	Symbol	Applications
Cut-off (Handed Edge)	CG	Cut-off / General-purpose
	CF	Cut-off / Low cutting force
Non-Ferrous Metals	GA	Non-Ferrous Metals / General-purpose

Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

Select holders and inserts with matching width of cut (CW). Not usable with GNDXL type / GNDIS type holders.

GNDXL type

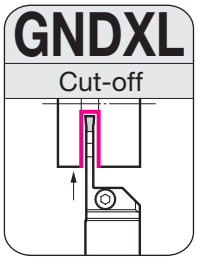


Fig 1

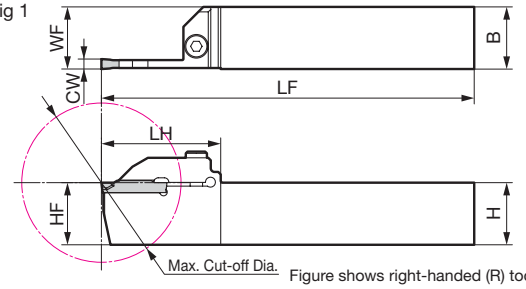


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Width of Cut CW	Max. Cut-off Dia.	Applicable Insert	Fig	Cap Screw	Cap Screw N·m	Wrench
GNDXL R/L2020K-226			20	20	125	20	20	42.0	**2.0**	**52**	GCM N2002-GF1	1			
GNDXL R/L2020K-332	●	●	20	20	125	20	20	48.0	**3.0**	**64**	GCM N30○○-□□1	1			
GNDXL R/L2020K-432	●	●	20	20	125	20	20	48.0	**4.0**	**64**	GCM N40○○-□□1	1	BX0520	**5.0**	LH040
GNDXL R/L2020K-532	●	●	20	20	125	20	20	48.0	**5.0**	**64**	GCM N50○○-□□1	1			
GNDXL R/L2020K-632	●	●	20	20	125	20	20	48.0	**6.0**	**64**	GCM N60○○-□□1	1			
GNDXL R/L2525M-226			25	25	150	25	25	42.0	**2.0**	**52**	GCM N2002-GF1	1			
GNDXL R/L2525M-332	●	●	25	25	150	25	25	48.0	**3.0**	**64**	GCM N30○○-□□1	1			
GNDXL R/L2525M-432	●	●	25	25	150	25	25	48.0	**4.0**	**64**	GCM N40○○-□□1	1	BX0520	**5.0**	LH040
GNDXL R/L2525M-532	●	●	25	25	150	25	25	48.0	**5.0**	**64**	GCM N50○○-□□1	1			
GNDXL R/L2525M-632	●	●	25	25	150	25	25	48.0	**6.0**	**64**	GCM N60○○-□□1	1			

Select holders and inserts with matching width of cut (CW). Only 1-cornered inserts can be used. Refer to F95 for applicable inserts.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item (new product/expanded item)

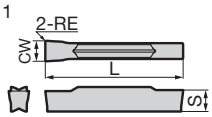
GNDXL type

New

Inserts for GNDXL type (1-cornered)

(Coated Carbide)

Fig 1



Grooving / Traverse Cutting (1-cornered)

Dimensions (mm)

Cat. No.	AC5015S	AC5025S	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
				Width of Cut	Tolerance	RE	L	S		
GCM N3002-ML1	●	●	●	**3.0**	±0.03	0.2	21.1	3.8	5	1
GCM N4004-ML1	●	●	●	**4.0**	±0.03	0.4	26.4	4.0		1
GCM N5004-ML1	●	●	●	**5.0**	±0.03	0.4	26.4	4.1		1
GCM N6004-ML1	●	●	●	**6.0**	±0.03	0.4	26.4	4.5		1

Grooving / Cut-off (1-cornered)

Dimensions (mm)

Cat. No.	AC5015S	AC5025S	AC530U	Width of Cut CW		Corner Radius	Overall Length	Thickness	Pcs/Pack	Fig
				Width of Cut	Tolerance	RE	L	S		
GCM N2002-GF1				**2.0**	±0.03	0.2	21.1	3.6	5	1
GCM N3002-GF1	●	●	●	**3.0**	±0.03	0.2	21.1	3.8		1
GCM N4002-GF1	●	●	●	**4.0**	±0.03	0.2	26.4	4.0		1
GCM N5002-GF1	●	●	●	**5.0**	±0.03	0.2	26.4	4.1		1
GCM N6002-GF1	●	●	●	**6.0**	±0.03	0.2	26.4	4.5		1

Select holders and inserts with matching width of cut (CW). Use in combination with GNDXL type holders. Not usable with GNDIS type holders.

Part Number Suffix Code (Chipbreakers)

Type	Symbol	Applications
Grooving / Traverse Cutting	ML	Multi-functional / Low-feed
Grooving / Cut-off	GF	Grooving / Low cutting force

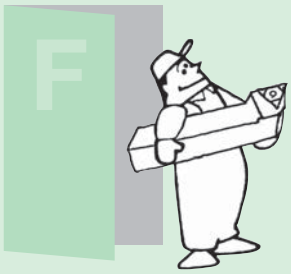
Chipbreaker Selection F13 Precautions for Use F22 Recommended Cutting Conditions F19

● mark: Standard stocked item (new product/expanded item)

MEMO

Threading Tools F

F97 to F119



Threading Tools

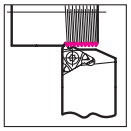
	SEC-Threading Tool series Selection Guide	F98
	Basics of Threads	F101
For External/Internal Threading	SSTE type / SSTI type	F102
	SSTE/SSTI type Guidelines for Depth of Cut and No. of Passes	F108
For External Threading	STH series (Small Pitch)	F110
	GME-TH series (Large Pitch)	F111
	LTE series (General-purpose)	F112
	STE series (General-purpose)	F113
	THE type (General-purpose) / THE type (For Small Lathes)	F114
For Internal Threading	STI series (General-purpose)	F115
	STHI series (Small Diameter / General-purpose)	F116
	THI series (General-purpose)	F117
	Threading Tool Guidelines for Depth of Cut and No. of Passes	F118

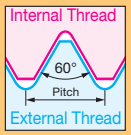
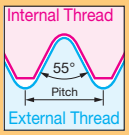
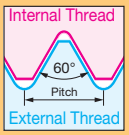
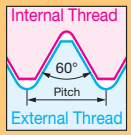
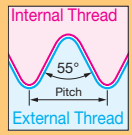
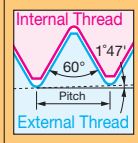
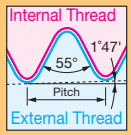
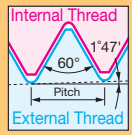
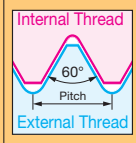
Stock Markings and Symbols

● ● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

Selection Guide

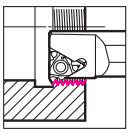
■ External Threading

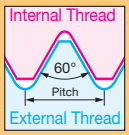
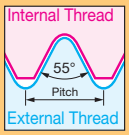
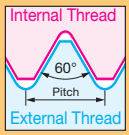
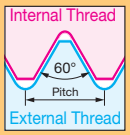
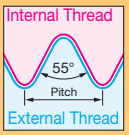
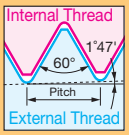
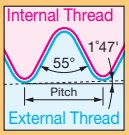
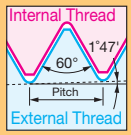
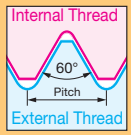


Applications / Thread Ridge Shape / Type	General Industrial Use				Pipe Coupling for Gas, Water and Water Faucets		Pipe Threads for Steam, Gas and Water Supply Pipes		For Aerospace Equipment
									
Type	60° General-purpose Thread	55° General-purpose Thread (Whitworth)	60° ISO Metric Thread	60° Unified Thread	55° Parallel Thread for Pipe/Whitworth	60° American NPT	55° Taper Thread for Pipe BSPT	60° American NPTF	UNJ 60°
Symbol	M / UNC/UNF	W	M	UNC/UNF	G/Rp/W	NPT	R/Rc	NPTF	UNJ
Pitch	mm / Threads/Inch	Threads/Inch	mm	Threads/Inch	Threads/Inch	Threads/Inch	Threads/Inch	Threads/Inch	Threads/Inch
Wiper Edge	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSTE type → F102	0.50 to 3.00 / 48 to 8	48 to 8	0.75, 1.00, 1.25 1.50, 1.75, 2.00 2.50, 3.00	32, 28, 24 20, 18, 16 14, 13, 12 10, 8	36, 32, 28 24, 20, 19 18, 16, 14 12, 11, 10 8	27, 18, 14 11.5, 8	28, 19 14, 11	27, 18, 14 11.5	32, 28, 24 20, 18, 16 14, 12, 10
LTE type → F112	1.00 to 3.00 / 24 to 8	24 to 10	1.00, 1.25, 1.50 1.75, 2.00, 2.50 3.00, 3.50, 4.00	24, 20, 18 16, 14, 12 8	–	–	28, 19 14, 11	–	–
STE type → F113	1.00 to 3.00 / 24 to 8	24 to 10	1.00, 1.25, 1.50 1.75, 2.00, 2.50 3.00	24, 20, 18 16, 14, 12 8	–	–	28, 19 14, 11	–	–
THE type → F114	0.80 to 3.00	24 to 10	0.80, 1.00, 1.25 1.50, 1.75, 2.00 2.50	–	–	–	28, 19	–	–
GME-TH type → F111	3.00 to 6.00	11 to 4.5	–	–	–	–	–	–	–
STH type → F110	0.20 to 1.50	48 to 16	–	–	–	–	–	–	–

Selection Guide

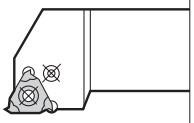
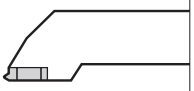
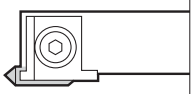
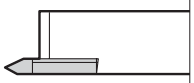
■ Internal Threading



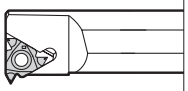
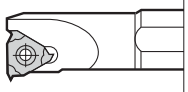
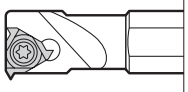
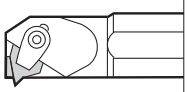
Applications / Thread Ridge Shape / Type	General Industrial Use				Pipe Coupling for Gas, Water and Water Faucets		Pipe Threads for Steam, Gas and Water Supply Pipes		For Aerospace Equipment
									
	60° General-purpose Thread	55° General-purpose Thread (Whitworth)	60° ISO Metric Thread	60° Unified Thread	55° Parallel Thread for Pipe/Whitworth	60° American NPT	55° Taper Thread for Pipe BSPT	60° American NPTF	UNJ 60°
Symbol	M / UNC/UNF	W	M	UNC/UNF	G/Rp/W	NPT	R/Rc	NPTF	UNJ
Pitch	mm / Threads/Inch	Threads/Inch	mm	Threads/Inch	Threads/Inch	Threads/Inch	Threads/Inch	Threads/Inch	Threads/Inch
Wiper Edge	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SSTI type → F102	0.50 to 3.00 / 48 to 8	48 to 8	0.75, 1.00, 1.25 1.50, 1.75, 2.00 2.50, 3.00	32, 28, 24 20, 18, 16 14, 13, 12 10, 8	28, 24 20, 19	27, 18, 14 11.5, 8	28, 19	27, 18, 14 11.5, 8	32, 28, 24 20, 18, 16 14, 12, 10
STI type → F115	1.00 to 3.00 / 24 to 8	—	1.00, 1.25, 1.50 1.75, 2.00, 2.50 3.00	—	—	—	—	—	—
STHI type → F116	0.40 to 1.00	—	—	—	—	—	—	—	—
THI type → F117	0.80 to 2.50	—	1.50, 2.00	—	—	—	—	—	—

Product Range

■ External Threading Tools

Series	Appearance	Structure: Screw-on	Clamp-on	Lever Lock	Drawing Pin	Features	Applicable Thread Symbol
SSTE	→ F102	●				· Adopts a flat 3-cornered insert. Ground cutting edge flank produces superior machined surface with sharp cutting edge. · Stable chip control through use of a 3D molded chipbreaker. · Large lineup of inserts with a wiper edge	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ
LTE/ STE	 → F112, F113	●		●		· Range of lever lock holders with strong clamping force (25 to 32mm square) and screw-on type holders (12 to 16mm square). · M-Class flat-mounted 3-cornered insert is economical · Range of cermet grades · Stable chip control with incorporated chipbreaker	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ
THE	 → F114	●			●	· 3-cornered tangentially-mounted G-class insert with excellent sharpness · The 20mm and 25mm square shanks are the strong drawing pin type, and the 12mm and 16mm square shanks are the screw-on type. · Range of cermet grades for inserts without a wiper edge	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ
GME-TH	 → F111		●			· 2-cornered insert adopted for large-pitch threading of 3 to 6mm · Range of 11 to 4.5 TPI tools for 55° apex angle · Strong clamping through use of clamp plate	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ
STH	 → F110	●				· For small lathes 20mm square or less · 2-cornered tangentially-mounted insert enables space-saving threading · Can also be used for back-turn threading with bar feeder · Can also be used for small-pitch (min. 0.2mm) threading	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ

■ Internal Threading Tools

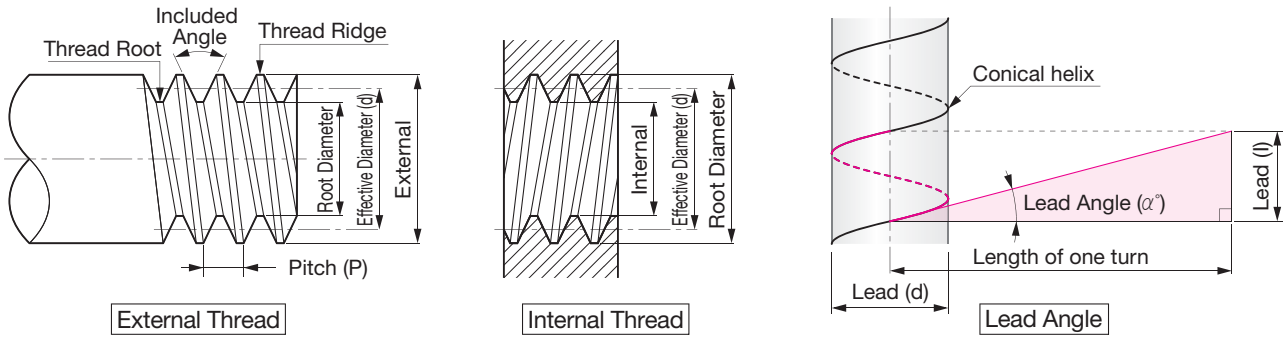
Series	Appearance	Structure: Screw-on	Clamp-on	Lever Lock	Drawing Pin	Features	Min. Bore Dia. (mm)	Applicable Thread Symbol
SSTI	 → F102	●				· Adopts a flat 3-cornered insert. Ground cutting edge flank produces superior machined surface with sharp cutting edge. · Stable chip control through use of a 3D molded chipbreaker. · Large lineup of inserts with a wiper edge	ø18	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ
STI	 → F115	●				· M-Class flat-mounted 3-cornered insert is economical · Stable chip control with incorporated chipbreaker. · Range of cermet grades	ø20	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ
STHI	 → F116	●				· Applicable for small diameter (minimum ø8mm), small pitch (0.4 - 1.0mm) threading · Perfect for small product machining	ø8	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ
THI	 → F117		●			· G-Class 3-cornered insert with good sharpness	ø18	M W UNC/UNF G/Rp/W NPT R/Rc NPTF UNJ

Note: The minimum bore diameter is the diameter of the prepared hole.

M : 60° ISO General-purpose Metric Thread
W : 55° General-purpose Thread (Whitworth)
UNC/UNF : 60° Unified Thread
G/Rp/W : 55° Parallel Thread for Pipe
NPT : 60° American NPT
R/Rc : 55° Taper Thread for Pipe BSPT
NPTF : 60° American NPTF
UNJ : 60° UNJ

Basics of Threads

■ Parts of a Screw



Effective Diameter (d) : Diameter of imaginary cylinder that passes through the thread at the point where the groove and ridge widths are equal
Pitch (P) : Distance between two ridges adjacent to each other
Lead (l) : Distance the screw thread moves axially in one turn
(On a single threaded screw, the lead and pitch are identical.)
Lead Angle (α°) : Angle made by the conical helix of the thread ridge at a pitch diameter with a plane perpendicular to the axis

● Lead Angle Calculation

$$\tan\alpha^\circ = \frac{l}{\pi \times d} = \frac{n \times P}{\pi \times d}$$

α° : Lead Angle
l : Lead
n : No. of Threads
P : Pitch
d : Effective Screw Diameter

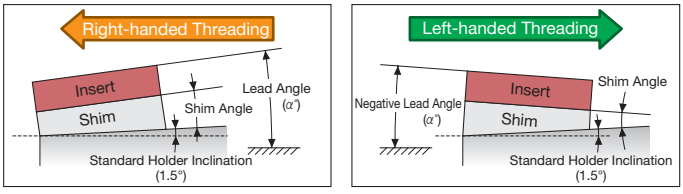
■ Main Screw Types and Standard Thread Patterns

Applications	Symbol	Basic Profile	Applications	Symbol	Basic Profile	Applications	Symbol	Basic Profile	Applications	Symbol	Basic Profile
Metric Thread	M	Internal Thread 1/4P 60° h 1/8P External Thread	Parallel Thread for Pipe	Internal Thread G(PF) Rp(PS) External Thread G(PF)	Internal Thread R0.137P 55° h R0.137P External Thread	Taper Thread for Pipe	Internal Thread Rc(PT) (BSPT) External Thread R(PT) (BSPT)	R0.137P Internal Thread 27.5° 27.5° 90° 1°47' R0.137P External Thread	Unified Thread	UN UNC UNF UNEF	Internal Thread 1/4P 60° h 1/8P External Thread
Whitworth Thread	W BSW BSP	Internal Thread R0.137P 55° h R0.137P External Thread	Thread for Aerospace Instruments	UNJ	Internal Thread 5/16P 60° h R External Thread	American Taper Thread for Pipe	NPT	Internal Thread 30° 30° h 90° 1°47' External Thread	American Taper Thread for Pipe	NPTF	Internal Thread 30° 30° h 90° 1°47' External Thread

■ Tool Holder and Insert Selection Guide (SSTE type / SSTI type)

	External Threads (Normal Spindle Rotation)	Internal Threads (Normal Spindle Rotation)	External Threads (Reverse Spindle Rotation)
Right-handed Threading	External Holder (SSTE type) / External Diameter Insert (16ER type) / Shim (YE3-3P/YE3-2P YE3-1P/YE3/YE3-1N)	Internal Holder (SSTI type) / Internal Diameter Insert (16IR type) / Shim (YI3-3P/YI3-2P YI3-1P/YI3/YI3-1N)	External Holder (SSTE type) / External Diameter Insert (16ER type) / Shim (YE3-3P/YE3-2P YE3-1P/YE3/YE3-1N)
Left-handed Threading	External Holder (SSTE type) / External Diameter Insert (16ER type) / Shim (YE3-2N/YE3-3N)	Internal Holder (SSTI type) / Internal Diameter Insert (16IR type) / Shim (YI3-2N/YI3-3N)	External Holder (SSTE type) / External Diameter Insert (16ER type) / Shim (YE3-2N/YE3-3N)

■ Threading Method and Insert Angle

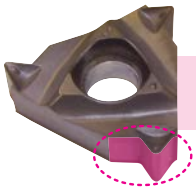


SSTE type/SSTI type

VIDEO OF CUTTING

■ Features

- High-precision inserts with wiper edge for threading, supporting a wide range of applications from general industrial machinery to pipes and aerospace devices
- Stable chip control through use of a 3D molded chipbreaker.
- Ground cutting edge flank for improved cutting edge sharpness, resulting in high quality threads



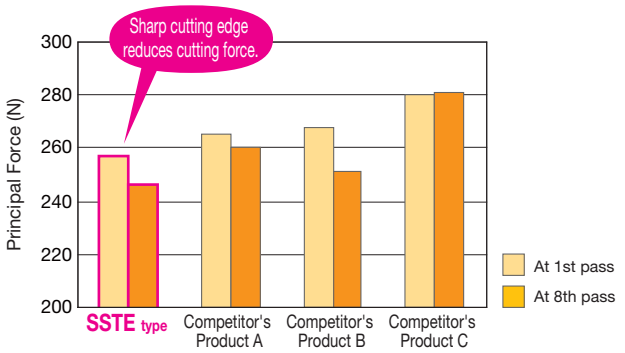
Ground flanks around cutting edge

■ Product Range

Applications	Type	Wiper Edge	External/ Internal	Pitch (mm)	TPI (Threads/Inch) 48 36 32 28 27 24 20 19 18 16 14 13 12 11.5 11 10 8	Insert Cat. No. Example:
General Industrial Use	60° General-purpose Thread	No	External	0.5 – 3.0	48 to 8	16ER A60-CB
			Internal	0.5 – 3.0	48 to 8	16IR A60-CB
	55° General-purpose Thread		External		48 to 8	16ER A55-CB
			Internal		48 to 8	16IR A55-CB
	60° ISO Metric Thread	Yes	External	0.75 1.0 1.25 1.5 1.75 2.0 2.5 3.0		16ER 075ISO-CB
			Internal	0.75 1.0 1.25 1.5 1.75 2.0 2.5 3.0		16IR 075ISO-CB
	60° Unified Thread		External		32 28 24 20 18 16 14 13 12	16ER 32UN-CB
			Internal		32 28 24 20 18 16 14 13 12	16IR 32UN-CB
Pipe Coupling for Gas, Water and Water Faucets	55° Parallel Thread for Pipe/Whitworth		External		36 28 20 19 18 16 14 11	16ER 36W-CB
			Internal		28 20 19 18 16 14 11	16IR 28W-CB
	60° American NPT		External		27 18 14 11.5 8	16ER 27NPT-CB
			Internal		27 18 14 11.5 8	16IR 27NPT-CB
Steam, Gas and Water Supply Pipes	55° Taper Thread for Pipe BSPT		External		28 20 19 14 11	16ER 28BSPT-CB
			Internal		28 20 19 14 11	16IR 28BSPT-CB
	60° American NPTF		External		27 18 14 13 8	16ER 27NPTF-CB
			Internal		27 18 14 13 8	16IR 27NPTF-CB
For Aerospace Equipment	UNJ 60°		External		32 28 24 20 18 16 14 13 12	16ER 32UNJ-CB
			Internal		32 28 24 20 18 16 14 13 12	16IR 32UNJ-CB

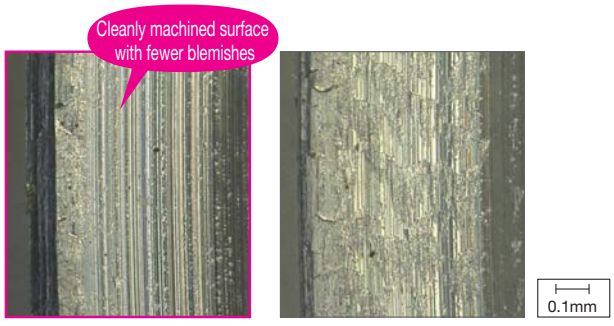
■ Application Examples

● Comparison of Cutting Force



Work Material: S45C M30×1.5
Cutting Conditions: vc=150m/min Wet 8 Passes Thread infeed method: Radial infeed

● Machined Surface Comparison



Work Material: S45C M30×1.5
Cutting Conditions: vc=150m/min Wet 8 Passes Thread infeed method: Radial infeed

SSTE type/SSTI type

External

External Turning
Screw-on

SSTE
External Threading

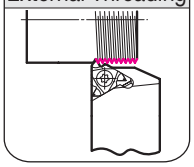
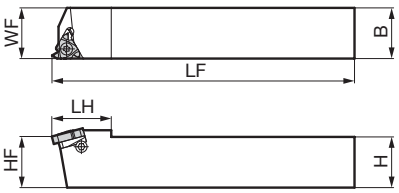
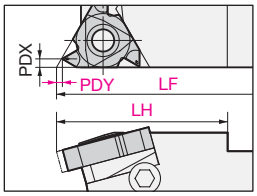


Fig 1





The values for dimensions LF and LH below are only for reference.
The actual value is the value below minus the PDY value for the corresponding insert on F104.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Head LH	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Flat Head Screw	N·m	Shim Screw	Flat Washer	Shim	Wrench
SSTE R1616H16	●	16	16	100	20.5	16	16	1						
SSTE R2020K16	●	20	20	125	30.0	20	20	1	BFTX0312N	**2.0**	BX0304*1	PW3	YE3	TRX10
SSTE R2525M16	●	25	25	150	30.0	25	25	1						

*1: Shim screw wrench is sold separately.

Internal

Internal Boring
Screw-on

SSTI
Internal Threading

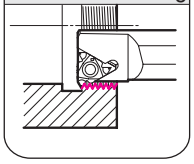


Fig 1

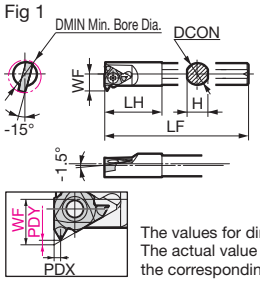


Fig 2

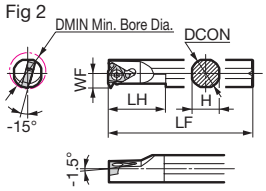
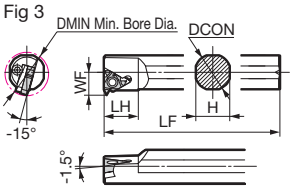


Fig 3



The values for dimension WF below are only for reference.
The actual value is the value below minus the PDY value for the corresponding insert on F105.

Holder

Parts

Dimensions (mm)

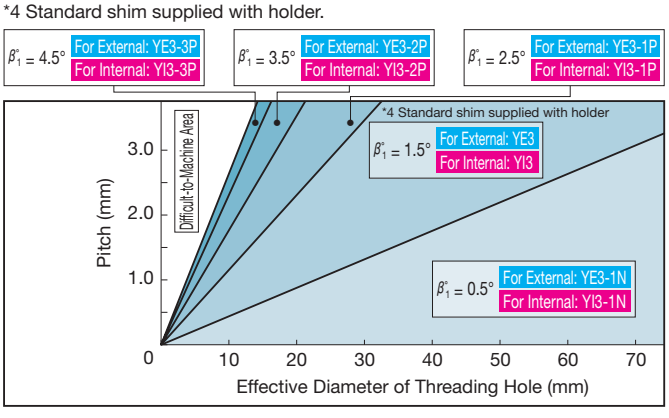
Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Head LH	Cutting Edge Distance WF	Min. Bore Dia. DMIN*2	Fig	Flat Head Screw	N·m	Shim Screw	Flat Washer	Shim	Wrench
SSTI R1812M16*3	●	12	11.0	150	32.0	10.2	18	1	BFTX03085N	**2.0**	—	—	—	TRX10
SSTI R2016M16*3	●	16	15.0	150	63.5	9.2	20	2						
SSTI R2420Q16	●	20	18.0	180	19.0	13.5	24	3						
SSTI R3125S16	●	25	23.0	250	14.3	16.5	31	3	BFTX0312N	**2.0**	BX0304*1	PW3	YI3	
SSTI R3732S16	●	32	30.0	250	14.3	20.0	37	3						

*1: Shim screw wrench is sold separately. *2 The minimum bore diameter is the diameter of the prepared hole. *3 Left-hand threads are not available.

Shim and Selection Criteria

Applications	Recommended Lead Angle (β°_1)	External Turning Cat. No.	External Turning Stock	Internal Boring Cat. No.	Internal Boring Stock
Right-hand Thread	4.5°	YE3-3P	●	YI3-3P	●
	3.5°	YE3-2P	●	YI3-2P	●
	2.5°	YE3-1P	●	YI3-1P	●
	1.5°	YE3*4	●	YI3*4	●
	0.5°	YE3-1N	●	YI3-1N	●
Left-hand Thread	-0.5°	YE3-2N	●	YI3-2N	●
	-1.5°	YE3-3N	●	YI3-3N	●

*4 Standard shim supplied with holder.



Holder Identification Code

Example: **S S T E R 25 25 M 16**

(1) Series Code: SST type

(2) External/Internal

Symbol	Distinction
E	External
I	Internal

(3) Feed Direction

Symbol	Feed Direction
R	Right Hand

(4) Shank Height/Work Dia.

Symbol	(mm)
External Holders (Shank Height) 16	16
20	20
25	25
Internal Holders (Min. Bore Diameter) 18	18
20	20
24	24
31	31
37	37

(5) Shank Width/ Diameter

Symbol	(mm)
External Holders (Shank Width) 16	16
20	20
25	25
Internal Holders (Shank Diameter) 12	12
16	16
20	20
25	25
32	32

(6) Overall Length Symbol

Symbol	(mm)
H	100
K	125
M	150
Q	180
S	250

(7) Insert Size

Symbol	Inscribed Circle (mm)
16	9.525

Details of Shim Selection F106

(N·m) Recommended Tightening Torque (N·m)

SSTE type/SSTI type

External

SSTE type Guidelines for Depth of Cut and No. of Passes F108

Fig 1

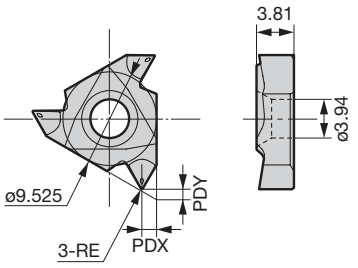
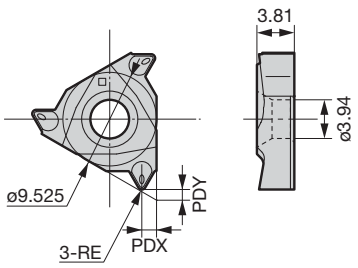


Fig 2



(Coated Carbide)

60°/55° General-purpose Threads (Without Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch mm	Pitch Threads/Inch	X Direction PDX	Y Direction PDY	Corner Radius RE	Pcs/ Pack	Fig
60°	**16ER A60-CB**	●	0.5-1.5	16 - 48	0.8	0.6	0.09	5	1
	16ER AG60-CB	●	0.5-3.0	8 - 48	1.5	1.1	0.10		1
	16ER G60-CB	●	2.0-3.0	8 - 14	1.5	1.1	0.20		1
55°	**16ER A55-CB**	●	—	16 - 48	0.8	0.5	0.05		1
	16ER AG55-CB	●	—	8 - 48	1.5	1.1	0.08	5	1
	16ER G55-CB	●	—	8 - 14	1.5	1.1	0.22		1

60° ISO Metric Thread (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch mm	Pitch Threads/Inch	X Direction PDX	Y Direction PDY	Corner Radius RE	Pcs/ Pack	Fig
60°	**16ER 075 ISO-CB**	●	0.75	—	0.5	1.0	0.09	5	2
	16ER 100 ISO-CB	●	1.00	—	0.8	0.6	0.14		2
	16ER 125 ISO-CB	●	1.25	—	0.8	0.7	0.15		2
	16ER 150 ISO-CB	●	1.50	—	0.8	0.7	0.20		2
	16ER 175 ISO-CB	●	1.75	—	1.5	1.0	0.23		2
	16ER 200 ISO-CB	●	2.00	—	1.5	1.1	0.26		2
	16ER 250 ISO-CB	●	2.50	—	1.5	1.2	0.33		2
	16ER 300 ISO-CB	●	3.00	—	1.5	1.1	0.41		2

60° Unified Thread (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch mm	Pitch Threads/Inch	X Direction PDX	Y Direction PDY	Corner Radius RE	Pcs/ Pack	Fig
60°	**16ER 32UN-CB**	●	—	32	0.5	1.0	0.10	5	2
	16ER 28UN-CB	●	—	28	0.8	0.7	0.11		2
	16ER 24UN-CB	●	—	24	0.8	0.7	0.13		2
	16ER 20UN-CB	●	—	20	0.8	0.7	0.16		2
	16ER 18UN-CB	●	—	18	0.8	0.7	0.18		2
	16ER 16UN-CB	●	—	16	0.8	0.8	0.20		2
	16ER 14UN-CB	●	—	14	1.5	1.2	0.23		2
	16ER 13UN-CB	●	—	13	1.5	1.1	0.26		2
	16ER 12UN-CB	●	—	12	1.5	1.0	0.27		2
	16ER 10UN-CB	●	—	10	1.5	1.2	0.33		2
	16ER 08UN-CB	●	—	8	1.5	1.2	0.42		2

55° Parallel Thread for Pipe/Whitworth (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch mm	Pitch Threads/Inch	X Direction PDX	Y Direction PDY	Corner Radius RE	Pcs/ Pack	Fig
55°	**16ER 36W-CB**	●	—	36	0.5	1.0	0.10	5	2
	16ER 32W-CB	●	—	32	0.5	1.0	0.11		2
	16ER 28W-CB	●	—	28	0.8	0.6	0.12		2
	16ER 24W-CB	●	—	24	0.8	0.6	0.15		2
	16ER 20W-CB	●	—	20	0.8	0.6	0.18		2
	16ER 19W-CB	●	—	19	0.8	0.6	0.18		2
	16ER 18W-CB	●	—	18	0.8	0.6	0.19		2
	16ER 16W-CB	●	—	16	0.8	0.6	0.22		2
	16ER 14W-CB	●	—	14	1.5	1.0	0.25		2
	16ER 12W-CB	●	—	12	1.5	1.1	0.29		2
	16ER 11W-CB	●	—	11	1.5	1.1	0.32		2
	16ER 10W-CB	●	—	10	1.5	1.1	0.35		2
	16ER 08W-CB	●	—	8	1.5	1.1	0.43		2

For these inserts, only SSTE type holders can be used.

60° American NPT (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch mm	Pitch Threads/Inch	X Direction PDX	Y Direction PDY	Corner Radius RE	Pcs/ Pack	Fig
60°	**16ER 27NPT-CB**	●	—	27	0.8	0.6	0.06	5	2
	16ER 18NPT-CB	●	—	18	0.8	0.6	0.06		2
	16ER 14NPT-CB	●	—	14	1.5	1.0	0.08		2
	16ER 115NPT-CB	●	—	11.5	1.5	1.0	0.08		2
	16ER 08NPT-CB	●	—	8	1.5	1.1	0.13		2

55° Taper Thread for Pipe/BSPT (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch mm	Pitch Threads/Inch	X Direction PDX	Y Direction PDY	Corner Radius RE	Pcs/ Pack	Fig
55°	**16ER 28BSPT-CB**	●	—	28	0.8	0.6	0.13	5	2
	16ER 19BSPT-CB	●	—	19	0.8	0.6	0.18		2
	16ER 14BSPT-CB	●	—	14	1.5	1.3	0.25		2
	16ER 11BSPT-CB	●	—	11	1.5	1.0	0.31		2

60° American NPTF (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch mm	Pitch Threads/Inch	X Direction PDX	Y Direction PDY	Corner Radius RE	Pcs/ Pack	Fig
60°	**16ER 27NPTF-CB**	●	—	27	0.8	0.6	0.06	5	2
	16ER 18NPTF-CB	●	—	18	0.8	0.6	0.06		2
	16ER 14NPTF-CB	●	—	14	1.5	1.0	0.13		2
	16ER 115NPTF-CB	●	—	11.5	1.5	1.0	0.12		2

60° UNJ (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch mm	Pitch Threads/Inch	X Direction PDX	Y Direction PDY	Corner Radius RE	Pcs/ Pack	Fig
60°	**16ER 32UNJ-CB**	●	—	32	0.5	1.0	0.13	5	2
	16ER 28UNJ-CB	●	—	28	0.8	0.6	0.15		2
	16ER 24UNJ-CB	●	—	24	0.8	0.6	0.18		2
	16ER 20UNJ-CB	●	—	20	0.8	0.7	0.21		2
	16ER 18UNJ-CB	●	—	18	0.8	0.6	0.23		2
	16ER 16UNJ-CB	●	—	16	0.8	0.6	0.25		2
	16ER 14UNJ-CB	●	—	14	1.5	1.1	0.29		2
	16ER 12UNJ-CB	●	—	12	1.5	1.1	0.34		2
	16ER 10UNJ-CB	●	—	10	1.5	1.1	0.40		2

Insert Identification Code

Example: **16 E R 150 ISO - CB**

(1) Insert Size	
Symbol	Inscribed Circle (mm)
16	9.525

(2) External/Internal	
Symbol	Distinction
E	External
I	Internal

(3) Feed Direction	
Symbol	Feed Direction
R	Right Hand

(4) Pitch or TPI

With Wiper Edge	Symbol	Pitch/TPI
		Metric = Pitch x 100 Inch=TPI (115 only for 11.5) (Example) 075: Pitch 0.75mm 150: Pitch 1.5mm 20: 20TPI
Without Wiper Edge	A	Pitch : 0.5 to 1.5mm TPI : 16 to 48
	AG	Pitch : 0.5 to 3.0mm TPI : 8 to 48
	G	Pitch : 2.0 to 3.0mm TPI : 8 to 14

(5) Thread type

Wiper Edge	Symbol	Type
Yes	ISO	Metric Thread
	UN	Unified Thread
	W	Whitworth
	NPT	American Taper Thread for Pipe
	BSPT	Taper Thread for Pipe
	NPTF	American Taper Thread for Pipe
	UNJ	For Aerospace Equipment
No	60	60° General-purpose Thread
	55	55° General-purpose Thread

(6) Chipbreaker	
Symbol	Description
CB	With Chipbreaker

SSTE type/SSTI type

Internal

SSTI type Guidelines for Depth of Cut and No. of Passes F109

Fig 1

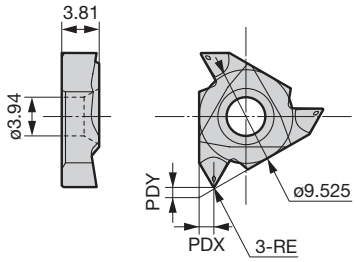
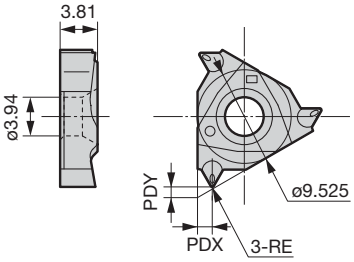


Fig 2



(Coated Carbide)

60°/55° General-purpose Threads (Without Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch		X Direction	Y Direction	Corner Radius	Pcs/ Pack	Fig
			mm	Threads/Inch	PDX	PDY	RE		
60°	**16IR A60-CB**	●	0.5-1.5	16 - 48	0.8	0.5	0.09	5	1
	16IR AG60-CB	●	0.5-3.0	8 - 48	1.5	1.1	0.10		1
	16IR G60-CB	●	2.0-3.0	8 - 14	1.5	1.1	0.18		1
55°	**16IR A55-CB**	●	—	16 - 48	0.8	0.5	0.05	5	1
	16IR AG55-CB	●	—	8 - 48	1.5	1.1	0.08		1
	16IR G55-CB	●	—	8 - 14	1.5	1.1	0.20		1

60° ISO Metric Thread (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch		X Direction	Y Direction	Corner Radius	Pcs/ Pack	Fig
			mm	Threads/Inch	PDX	PDY	RE		
60°	**16IR 075 ISO-CB**	●	0.75	—	0.5	0.9	0.04	5	2
	16IR 100 ISO-CB	●	1.00	—	0.8	0.6	0.06		2
	16IR 125 ISO-CB	●	1.25	—	0.8	0.6	0.07		2
	16IR 150 ISO-CB	●	1.50	—	0.8	0.6	0.09		2
	16IR 175 ISO-CB	●	1.75	—	1.5	1.0	0.10		2
	16IR 200 ISO-CB	●	2.00	—	1.5	1.1	0.13		2
	16IR 250 ISO-CB	●	2.50	—	1.5	1.1	0.15		2
	16IR 300 ISO-CB	●	3.00	—	1.5	1.1	0.19		2

60° Unified Thread (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch		X Direction	Y Direction	Corner Radius	Pcs/ Pack	Fig
			mm	Threads/Inch	PDX	PDY	RE		
60°	**16IR 32UN-CB**	●	—	32	0.5	0.9	0.04	5	2
	16IR 28UN-CB	●	—	28	0.8	0.6	0.06		2
	16IR 24UN-CB	●	—	24	0.8	0.7	0.06		2
	16IR 20UN-CB	●	—	20	0.8	0.6	0.08		2
	16IR 18UN-CB	●	—	18	0.8	0.6	0.08		2
	16IR 16UN-CB	●	—	16	0.8	0.7	0.09		2
	16IR 14UN-CB	●	—	14	1.5	1.1	0.13		2
	16IR 13UN-CB	●	—	13	1.5	1.1	0.11		2
	16IR 12UN-CB	●	—	12	1.5	1.1	0.13		2
	16IR 10UN-CB	●	—	10	1.5	1.1	0.15		2
	16IR 08UN-CB	●	—	8	1.5	1.1	0.20		2

55° Parallel Thread for Pipe/Whitworth (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch		X Direction	Y Direction	Corner Radius	Pcs/ Pack	Fig
			mm	Threads/Inch	PDX	PDY	RE		
55°	**16IR 28W-CB**	●	—	28	0.8	0.6	0.12	5	2
	16IR 24W-CB	●	—	24	0.8	0.6	0.14		2
	16IR 20W-CB	●	—	20	0.8	0.6	0.18		2
	16IR 19W-CB	●	—	19	0.8	0.6	0.18		2

60° American NPT (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch		X Direction	Y Direction	Corner Radius	Pcs/ Pack	Fig
			mm	Threads/Inch	PDX	PDY	RE		
60°	**16IR 27NPT-CB**	●	—	27	0.8	0.6	0.06	5	2
	16IR 18NPT-CB	●	—	18	0.8	0.6	0.06		2
	16IR 14NPT-CB	●	—	14	1.5	1.1	0.08		2
	16IR 115NPT-CB	●	—	11.5	1.5	1.0	0.08		2
	16IR 08NPT-CB	●	—	8	1.5	1.0	0.13		2

55° Taper Thread for Pipe/BSPT (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch		X Direction	Y Direction	Corner Radius	Pcs/ Pack	Fig
			mm	Threads/Inch	PDX	PDY	RE		
55°	**16IR 28BSPT-CB**	●	—	28	0.8	0.6	0.13	5	2
	16IR 19BSPT-CB	●	—	19	0.8	0.6	0.18		2

60° American NPTF (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch		X Direction	Y Direction	Corner Radius	Pcs/ Pack	Fig
			mm	Threads/Inch	PDX	PDY	RE		
60°	**16IR 27NPTF-CB**	●	—	27	0.8	0.6	0.06	5	2
	16IR 18NPTF-CB	●	—	18	0.8	0.6	0.08		2
	16IR 14NPTF-CB	●	—	14	1.5	1.0	0.13		2
	16IR 115NPTF-CB	●	—	11.5	1.5	1.0	0.08		2
	16IR 08NPTF-CB	●	—	8	1.5	1.1	0.13		2

60° UNJ (With Wiper Edge)

Dimensions (mm)

Thread Ridge Angle	Cat. No.	AC530U	Pitch		X Direction	Y Direction	Corner Radius	Pcs/ Pack	Fig
			mm	Threads/Inch	PDX	PDY	RE		
60°	**16IR 32UNJ-CB**	●	—	32	0.5	0.9	0.04	5	2
	16IR 28UNJ-CB	●	—	28	0.8	0.6	0.05		2
	16IR 24UNJ-CB	●	—	24	0.8	0.6	0.06		2
	16IR 20UNJ-CB	●	—	20	0.8	0.6	0.06		2
	16IR 18UNJ-CB	●	—	18	0.8	0.6	0.06		2
	16IR 16UNJ-CB	●	—	16	0.8	0.6	0.09		2
	16IR 14UNJ-CB	●	—	14	1.5	1.1	0.09		2
	16IR 12UNJ-CB	●	—	12	1.5	1.1	0.11		2
	16IR 10UNJ-CB	●	—	10	1.5	1.1	0.15		2

Insert Identification Code

Example: **16 I R 150 ISO - CB**

(1) Insert Size	
Symbol	Inscribed Circle (mm)
16	9.525

(2) External/Internal	
Symbol	Distinction
E	External
I	Internal

(3) Feed Direction	
Symbol	Feed Direction
R	Right Hand

(4) Pitch or TPI

Metric = Pitch x 100
Inch=TPI
(115 only for 11.5)
(Example) 075: Pitch 0.75mm
150: Pitch 1.5mm
20: 20TPI

With Wiper Edge		
Symbol	Pitch/TPI	
Without Wiper Edge	A	Pitch : 0.5 to 1.5mm TPI : 16 to 48
	AG	Pitch : 0.5 to 3.0mm TPI : 8 to 48
	G	Pitch : 2.0 to 3.0mm TPI : 8 to 14

(5) Thread type

Wiper Edge	Symbol	Type
Yes	ISO	Metric Thread
	UN	Unified Thread
	W	Whitworth
	NPT	American Taper Thread for Pipe
	BSPT	Taper Thread for Pipe
	NPTF	American Taper Thread for Pipe
	UNJ	For Aerospace Equipment
No	60	60° General-purpose Thread
	55	55° General-purpose Thread

(6) Chipbreaker	
Symbol	Description
CB	With Chipbreaker

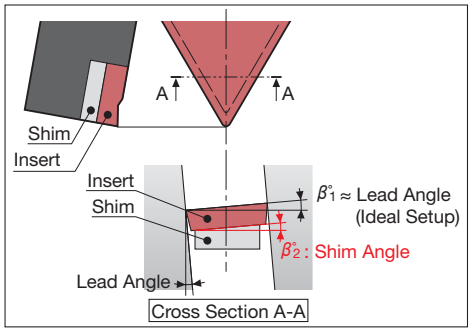
For these inserts, only SSTI type holders can be used.

SSTE type/SSTI type

■ Shim Selection

If the pitch is large or thread diameter is small, the lead angle of the thread becomes larger and the effective relief angle of the leading edge becomes smaller. It is ideal to set the threading insert so that both right and left relief angles are equal.

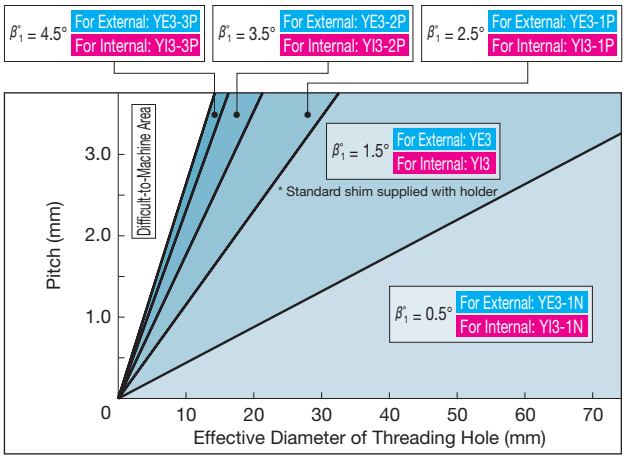
Therefore, it is necessary to select an appropriate shim based on the thread pitch and effective diameter using the table below.



■ Shim Selection Procedure

(1) Choose from [Right-Hand Thread / Left-Hand Thread] in the table.
(2) Locate the required threading "pitch".
(3) Locate the cell with the required "Effective Diameter" range.
(4) Confirm the part no. at the "Shim" row above the corresponding "Effective Diameter" cell located previously. If the shim part no. is different from the one currently in use, change to the correct one.

Example: When turning an M16×2.0 external right-hand thread, the pitch diameter is 14.701mm. In the table below, locate [2.0]mm under the "Pitch" column and then move along the row to the right to locate the required "Effective Diameter" range [11.4 - 17.4]mm. As such, the correct shim should be [YE3-1P], shown in the corresponding cell under the "External" row below.



● Pitch (mm)

Right-hand/Left-hand Thread		For Right-hand Thread					For Left-hand Thread	
Lead Angle		4.5°	3.5°	2.5°	1.5°	0.5°	-0.5°	-1.5°
Shim	External Turning	YE3-3P	YE3-2P	YE3-1P	YE3*	YE3-1N	YE3-2N	YE3-3N
	Internal Boring	YI3-3P	YI3-2P	YI3-1P	YI3*	YI3-1N	YI3-2N	YI3-3N
	Shim Angle (β°_1)	3°	2°	1°	0°	-1°	-2°	-3°
Pitch (mm)		Effective Diameter (mm)						
0.5		1.9 - 2.2	2.2 - 2.8	2.8 - 4.3	4.3 - 11.4	> 11.4	> 11.4	11.4 - 4.3
0.75		2.8 - 3.3	3.3 - 4.3	4.3 - 6.5	6.5 - 17.1	> 17.1	> 17.1	17.1 - 6.5
1.0		3.8 - 4.3	4.3 - 5.7	5.7 - 8.7	8.7 - 22.8	> 22.8	> 22.8	22.8 - 8.7
1.25		4.7 - 5.4	5.4 - 7.1	7.1 - 10.9	10.9 - 28.5	> 28.5	> 28.5	28.5 - 10.9
1.5		5.7 - 6.5	6.5 - 8.5	8.5 - 13.0	13.0 - 34.2	> 34.2	> 34.2	34.2 - 13.0
1.75		6.6 - 7.6	7.6 - 10.0	10.0 - 15.2	15.2 - 39.9	> 39.9	> 39.9	39.9 - 15.2
2.0		7.6 - 8.7	8.7 - 11.4	11.4 - 17.4	17.4 - 45.6	> 45.6	> 45.6	45.6 - 17.4
2.5		9.5 - 10.8	10.8 - 14.2	14.2 - 21.7	21.7 - 57.0	> 57.0	> 57.0	57.0 - 21.7
3.0		11.4 - 13.0	13.0 - 17.1	17.1 - 26.0	26.0 - 68.4	> 68.4	> 68.4	68.4 - 26.0

● TPI (threads/inch)

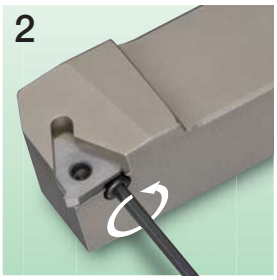
Right-hand/Left-hand Thread		For Right-hand Thread					For Left-hand Thread	
Lead Angle		4.5°	3.5°	2.5°	1.5°	0.5°	-0.5°	-1.5°
Shim	External Turning	YE3-3P	YE3-2P	YE3-1P	YE3*	YE3-1N	YE3-2N	YE3-3N
	Internal Boring	YI3-3P	YI3-2P	YI3-1P	YI3*	YI3-1N	YI3-2N	YI3-3N
	Shim Angle (β°_1)	3°	2°	1°	0°	-1°	-2°	-3°
TPI (Threads/Inch)		Effective Diameter (mm)						
32		3.0 - 3.3	3.3 - 4.6	4.6 - 6.9	6.9 - 18.0	> 18.0	> 18.0	18.0 - 6.9
28		3.0 - 3.8	3.8 - 5.1	5.1 - 7.9	7.9 - 20.8	> 20.8	> 20.8	20.8 - 7.9
27		3.6 - 4.1	4.1 - 5.3	5.3 - 8.1	8.1 - 21.3	> 21.3	> 21.3	21.3 - 8.1
24		4.1 - 4.6	4.6 - 6.1	6.1 - 9.1	9.1 - 24.4	> 24.4	> 24.4	24.4 - 9.1
20		4.8 - 5.6	5.6 - 7.1	7.1 - 10.9	10.9 - 29.0	> 29.0	> 29.0	29.0 - 10.9
18		5.3 - 6.1	6.1 - 8.1	8.1 - 12.4	12.4 - 32.5	> 32.5	> 32.5	32.5 - 12.4
16		5.8 - 6.9	6.9 - 8.9	8.9 - 13.7	13.7 - 35.8	> 35.8	> 35.8	35.8 - 13.7
14		6.9 - 7.9	7.9 - 10.2	10.2 - 15.7	15.7 - 41.1	> 41.1	> 41.1	41.1 - 15.7
13		7.4 - 8.4	8.4 - 11.2	11.2 - 17.0	17.0 - 44.7	> 44.7	> 44.7	44.7 - 17.0
12		8.1 - 9.1	9.1 - 12.2	12.2 - 18.5	18.5 - 48.8	> 48.8	> 48.8	48.8 - 18.5
11.5		8.4 - 9.7	9.7 - 12.4	12.4 - 19.3	19.3 - 50.3	> 50.3	> 50.3	50.3 - 19.3
11		8.9 - 9.9	9.9 - 13.2	13.2 - 20.1	20.1 - 52.6	> 52.6	> 52.6	52.6 - 20.1
10		9.7 - 10.9	10.9 - 14.5	14.5 - 22.1	22.1 - 57.9	> 57.9	> 57.9	57.9 - 22.1
9		10.7 - 12.2	12.2 - 16.0	16.0 - 24.4	24.4 - 64.3	> 64.3	> 64.3	64.3 - 24.4
8		11.9 - 13.7	13.7 - 18.0	18.0 - 27.7	27.7 - 72.4	> 72.4	> 72.4	72.4 - 27.7

* SSTE type / SSTI type holders are shipped with shims for a lead angle of β°_1 = 1.5° (SSTE type: YE3, SSTI type: YI3).
Shims for lead angles of β°_1 = -1.5°, -0.5°, 0.5°, 2.5°, 3.5°, and 4.5° are sold separately.
* Shims are not needed for SSTI R1812M16 and SSTI R2016M16. (The holders are already provided with the standard holder inclination of 1.5°.)

SSTE type/SSTI type

■ Shim Replacement

Remove the insert to expose the shim.

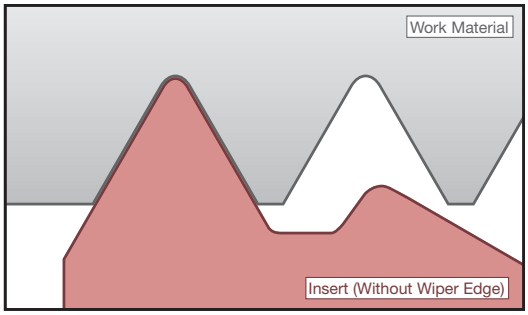
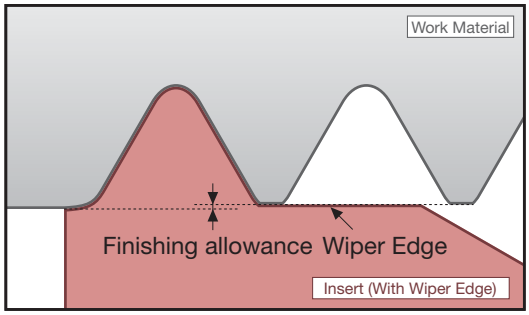


Loosen the shim set screw by one to two turns.

Remove the shim and attach a different shim that matches the lead.

Tighten the shim set screw. (Recommended Tightening Torque 1.0 to 1.5N·m)

■ Wiper Edge

Without Wiper Edge	With Wiper Edge
	
· Performs threading without machining thread ridges (the machined surface from the previous process is left unworked.) · Enables machining of threads with different pitch widths with the same insert. · Finishing of the internal (or external) diameter is required before the threading process. · Fine burrs are easily formed on edges of ridges.	· Enables turning of workpieces into shapes compliant with thread standards. · Only specific thread specifications and pitch can be machined. · In order to finish a thread with the wiper edge, a finishing allowance of 0.1mm on each side is required. · Edges of ridges can be rounded off.

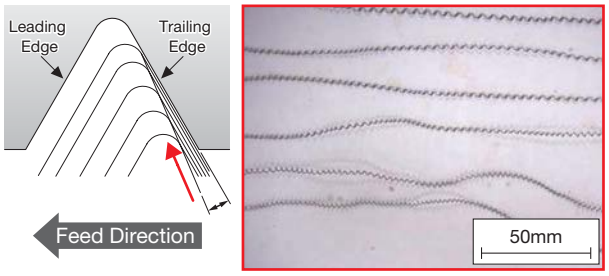
■ Infeed Method

The modified flank infeed is recommended for the SSTE type / SSTI type.
This infeed method, which features reduced chip curl diameters and stable chip control, can also decrease chipping on trailing edges that often occurs in radial infeed machining. (1° is recommended for the modification angle.)

● Impact of Infeed Method on Chip Shapes

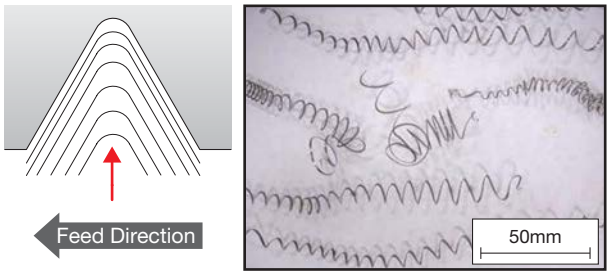
Work Material: SUS316, M30 x 1.5 Cutting Conditions: vc = 60m/min Wet, 8 Passes

Modified Flank Infeed



Reduced curl diameters ensure smooth, stable chip control (performance).

Radial Infeed Machining



Large curl diameters cause unstable chip control.

Guide to Depth of Cut and No. of Passes

SSTE type Guidelines for Depth of Cut

External Metric Threads (Depth of cut per pass: mm)

Pitch (mm)	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00
Overall Depth of Cut (mm)	0.48	0.64	0.80	0.92	1.10	1.26	1.57	1.87
No. of Passes	4	5	7	8	10	12	14	16
1	0.24	0.25	0.25	0.28	0.28	0.30	0.38	0.40
2	0.12	0.15	0.15	0.15	0.15	0.16	0.19	0.22
3	0.07	0.11	0.12	0.12	0.12	0.13	0.15	0.15
4	0.05	0.08	0.09	0.10	0.10	0.10	0.10	0.13
5		0.05	0.08	0.09	0.10	0.09	0.10	0.12
6			0.06	0.07	0.09	0.09	0.09	0.10
7			0.05	0.06	0.08	0.08	0.09	0.10
8				0.05	0.07	0.07	0.08	0.09
9					0.06	0.07	0.08	0.09
10					0.05	0.06	0.07	0.08
11						0.06	0.07	0.08
12						0.05	0.06	0.07
13							0.06	0.07
14							0.05	0.06
15								0.06
16								0.05

External Unified Threads (Depth of cut per pass: mm)

Threads/Inch	32	28	24	20	18	16	14	13	12	11	10	9	8
Overall Depth of Cut (mm)	0.50	0.57	0.67	0.80	0.89	1.00	1.15	1.23	1.34	1.46	1.60	1.78	2.00
No. of Passes	4	4	5	7	8	10	11	12	12	14	14	16	16
1	0.24	0.25	0.25	0.26	0.26	0.28	0.28	0.30	0.30	0.30	0.38	0.38	0.40
2	0.14	0.17	0.19	0.15	0.15	0.15	0.15	0.18	0.18	0.18	0.20	0.20	0.25
3	0.07	0.10	0.12	0.10	0.12	0.10	0.12	0.13	0.13	0.13	0.15	0.13	0.19
4	0.05	0.05	0.06	0.09	0.10	0.09	0.10	0.10	0.12	0.12	0.12	0.12	0.16
5			0.05	0.08	0.08	0.08	0.10	0.08	0.11	0.11	0.10	0.11	0.14
6				0.07	0.07	0.07	0.09	0.08	0.10	0.10	0.09	0.10	0.12
7				0.05	0.06	0.07	0.08	0.07	0.09	0.08	0.09	0.10	0.11
8					0.05	0.06	0.07	0.07	0.08	0.08	0.08	0.09	0.10
9						0.05	0.06	0.06	0.07	0.07	0.08	0.09	0.09
10						0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08
11							0.05	0.05	0.05	0.06	0.07	0.08	0.07
12								0.05	0.05	0.06	0.06	0.07	0.07
13										0.05	0.06	0.07	0.06
14										0.05	0.05	0.06	0.06
15												0.05	0.05
16												0.05	0.05

No. of passes and depths of cut in the table above are general guidelines only. Increase or decrease depending on conditions. However, the maximum depth of cut should be kept to 0.5mm or less.
When using an insert with a wiper edge, add machining allowance to the total depth of cut.

Recommended Cutting Conditions

Work Material	P Carbon Steel	P Alloy Steel (up to 330HB)	M Stainless Steel	K Grey Cast Iron (up to 330HB)	K Ductile Cast Iron	S Titanium Alloy
Cutting Speed vc (m/min)	75 to 150	75 to 135	60 to 120	90 to 180	75 to 135	24 to 90

Guide to Depth of Cut and No. of Passes

SSTI type Guidelines for Depth of Cut

■ Internal Metric Threads (Depth of cut per pass: mm)

Pitch (mm)	0.75	1.00	1.25	1.50	1.75	2.00	2.50	3.00
Overall Depth of Cut (mm)	0.49	0.58	0.74	0.89	1.04	1.18	1.47	1.76
No. of Passes	4	5	8	10	11	12	14	16
1	0.20	0.22	0.22	0.25	0.25	0.25	0.30	0.30
2	0.12	0.14	0.14	0.12	0.17	0.18	0.19	0.20
3	0.12	0.10	0.09	0.08	0.10	0.12	0.15	0.17
4	0.05	0.07	0.07	0.08	0.08	0.10	0.12	0.14
5		0.05	0.06	0.07	0.08	0.09	0.10	0.12
6			0.06	0.07	0.07	0.08	0.09	0.11
7			0.05	0.06	0.07	0.07	0.08	0.10
8			0.05	0.06	0.06	0.07	0.08	0.10
9				0.05	0.06	0.06	0.07	0.08
10				0.05	0.05	0.06	0.07	0.08
11					0.05	0.05	0.06	0.07
12						0.05	0.06	0.07
13							0.05	0.06
14							0.05	0.06
15								0.05
16								0.05

■ Internal Unified Threads (Depth of cut per pass: mm)

Threads/Inch	32	28	24	20	18	16	14	13	12	11	10	9	8
Overall Depth of Cut (mm)	0.43	0.49	0.57	0.69	0.76	0.86	0.98	1.06	1.15	1.25	1.37	1.53	1.72
No. of Passes	4	4	5	7	8	10	11	12	12	14	14	16	16
1	0.20	0.20	0.20	0.22	0.22	0.22	0.25	0.25	0.27	0.27	0.27	0.30	0.30
2	0.10	0.16	0.16	0.12	0.13	0.13	0.15	0.15	0.16	0.16	0.18	0.18	0.22
3	0.08	0.08	0.09	0.09	0.10	0.08	0.10	0.10	0.12	0.12	0.16	0.16	0.18
4	0.05	0.05	0.07	0.08	0.08	0.08	0.08	0.08	0.10	0.10	0.12	0.11	0.15
5			0.05	0.07	0.07	0.07	0.07	0.08	0.09	0.08	0.10	0.09	0.12
6				0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.09	0.09	0.11
7				0.05	0.05	0.06	0.06	0.07	0.07	0.07	0.08	0.08	0.10
8					0.05	0.06	0.06	0.06	0.06	0.07	0.07	0.08	0.09
9						0.05	0.05	0.06	0.06	0.06	0.06	0.07	0.08
10						0.04	0.05	0.05	0.05	0.06	0.06	0.07	0.07
11							0.04	0.05	0.05	0.05	0.05	0.06	0.06
12								0.04	0.04	0.05	0.05	0.06	0.06
13										0.04	0.04	0.05	0.05
14										0.04	0.04	0.05	0.05
15												0.04	0.04
16												0.04	0.04

No. of passes and depths of cut in the table above are general guidelines only. Increase or decrease depending on conditions. However, the maximum depth of cut should be kept to 0.5mm or less.
When using an insert with a wiper edge, add machining allowance to the total depth of cut.

■ Recommended Cutting Conditions

Work Material	P Carbon Steel	P Alloy Steel (up to 330HB)	M Stainless Steel	K Grey Cast Iron (up to 330HB)	K Ductile Cast Iron	S Titanium Alloy
Cutting Speed vc (m/min)	75 to 150	75 to 135	60 to 120	90 to 180	75 to 135	24 to 90

STH series

External

External Turning
Screw-on

M Metric Thread
W Whitworth Thread

SumiSmall

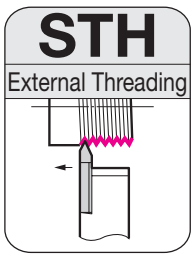


Fig 1

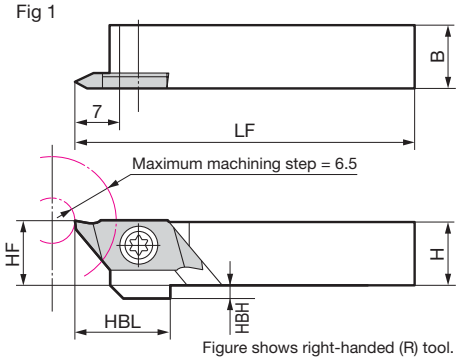


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Height HF	Step HBH	Bottom Offset HBL	Applicable Insert	Fig	Flat Head Screw	Wrench
STH R/L0810	●	●	8	10	120	8	4	15	TH R/L type	1	BFTX0410NTW	RT08
STH R/L1010	●	●	10	10	120	10	2	15		1		
STH R/L1212F	●	●	12	12	85	12	—	15		1	BFTX0412NTW	
STH R/L1212	●	●	12	12	120	12	—	15		1		
STH R/L1616H	●	●	16	16	100	16	—	15		1		
STH R/L1616	●	●	16	16	120	16	—	15		1		
STH R/L2020	●	●	20	20	80	20	—	15		1	BFTX0410NT	LT25NT

Insert (Coated Carbide)

Dimensions (mm)

Cat. No.	ACZ150 R	ACZ150 L	Pitch mm	Pitch Threads/Inch	Overall Length L	Height W1	Corner Radius RE	X Direction PDX	Included Angle PNA	Cutting Edge Shape	Applicable Holder	Fig
TH R/L6002075A	●	●	0.20 to 0.75	—	20	8	—	0.40	60	(A)	STH type	1
TH R/L6002075B	●	●	0.20 to 0.75	—	20	8	—	0.40	60	(A)		2
TH R/L6005125A	●	●	0.50 to 1.25	—	20	8	0.05	0.80	60	(B)		1
TH R/L6005125B	●	●	0.50 to 1.25	—	20	8	0.05	0.80	60	(B)		2
TH R/L601015N	●	●	1.00 to 1.50	—	20	8	0.10	1.25	60	(B)		3
TH R/L550515A	●	●	0.529 to 1.58	48 to 16	20	8	0.05	0.80	55	(B)		1
TH R/L550515B	●	●	0.529 to 1.58	48 to 16	20	8	0.05	0.80	55	(B)		2

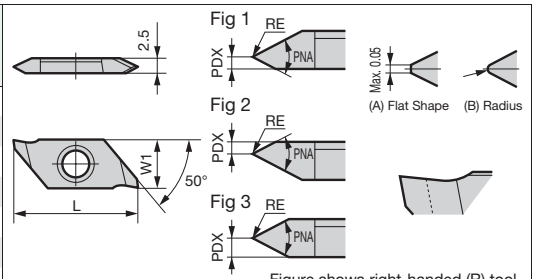
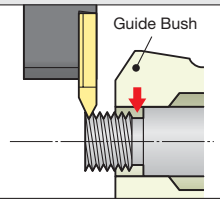
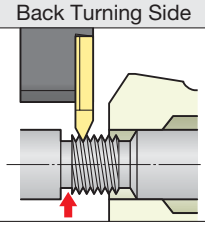
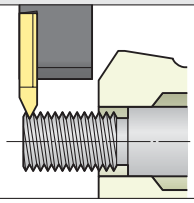
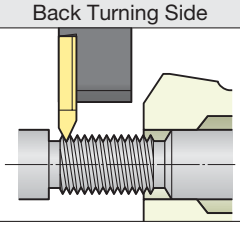


Figure shows right-handed (R) tool.

Recommended Cutting Conditions A24

Holder/Insert Combinations

Feed Direction	Right-handed		Left-handed	
Cutting Edge Position	Guide Bush Side	Back Turning Side	Guide Bush Side	Back Turning Side
Turning Condition				
Holders	STH R (Right-Hand)	STH R (Right-Hand)	STH L (Left-Hand)	STH L (Left-Hand)
Insert	TH R····A	TH R····B	TH L····B	TH L····A
Features	Often used in common tooling for workpieces that have a thread at their top end. In this type of tooling, the necking width indicated with the arrow can be reduced since the cutting edge point is placed closer to the guide bush side.	Often used when a thread is at the middle of the workpiece or at the rear. In this type of tooling, the necking width indicated with the arrow can be reduced since the cutting edge point is placed closer to the back turning side.	With a left hand holder used, a sufficient cutting distance can be kept since the cutting edge position is separate from the guide bush. For the left-hand holder, the selection of A type and B type is the reverse of the right-hand holder. (B indicates the guide bush side while A indicates the back turning side.)	

GME-TH series

External

Clamp-on
for Large External Pitch

M Metric Thread
W Whitworth Thread

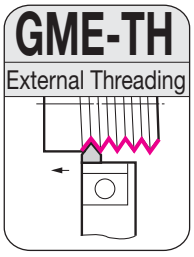


Fig 1

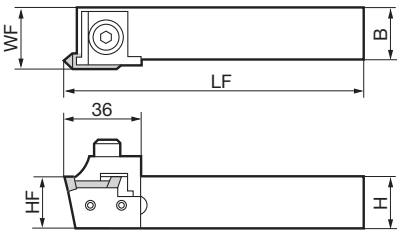


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

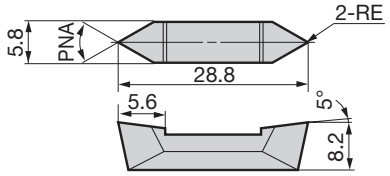
Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Clamp Plate	Support	Cap Screw	Wrench
GME R/L2525TH			25	25	144.7	29.3	25	1	GTC R/L	GT R/L	BX0414 (For Support) BX0820 (For Clamp Plate)	LH030 (For Support) LH060 (For Clamp Plate)
GME R/L2525THL			25	25	150.0	29.3	25	1				
GME R/L3232TH			32	32	170.0	36.3	32	1				

Inserts (□ Cemented Carbide)

Dimensions (mm)

Cat. No.	ST20E	A30	G10E	Pitch mm	Pitch Threads/Inch	Thread Ridge PNA	Corner Radius RE	Fig
MTG 40				3 to 4	—	60	0.3	1
MTG 50				5	—	60	0.4	1
MTG 60				6	—	60	0.5	1
MWG 40				—	11 to 9.0	55	0.3	1
MWG 50				—	8 to 6.0	55	0.4	1
MWG 60				—	5 to 4.5	55	0.6	1

Fig 1



Recommended Cutting Conditions

Work Material	P Carbon Steel	P Alloy Steel	M Stainless Steel
Cutting Speed vc (m/min)	70 to 120	70 to 100	70 to 100

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

SEC-External Threading Tool Holders LTE series

External

External Turning
Screw-on / Lever Lock

M Metric Thread
W Whitworth Thread
UNC/UNF Unified Thread
R/Rc Taper Thread for Pipe

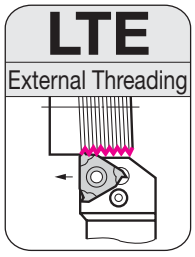
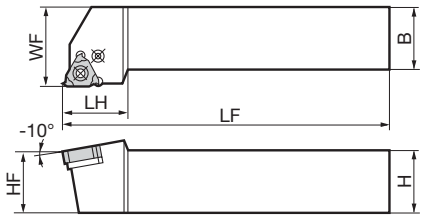


Fig 1



Holder

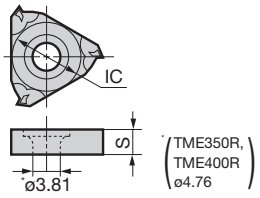
Parts

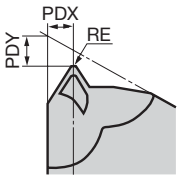
Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Head LH	Fig	Lever Pin	Bolt	Shim	Shim Retainer	Wrench
LTE R2020	●	20	20	125	25	20	25	1	LCL3S	LCS3TE	LSTE31-0	LSP3	LH025
LTE R2525	●	25	25	150	32	25	25	1					
LTE R2525M22	●	25	25	150	32	25	28	1	LCL4S	LCS4	LSTE42-0	LSP4	LH030
LTE R3232P22	●	32	32	170	40	32	28	1					

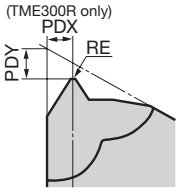
Refer to F119 for shim selection.

Fig 1





Close-up of Cutting Edge



Close-up of Cutting Edge

Inserts (Cermet)

Dimensions (mm)

Type	Cat. No.	Reference Cat. No.	Pitch mm	Pitch Threads/Inch	T1500A	T130A	Corner Radius RE	X Direction PDX	Y Direction PDY	Inscribed Circle IC	Thickness S	Wiper Edge	Applicable Holder	Fig
60° Metric Thread	**TME 100R**	16ER100ISO-TE	1.00	—	●	●	0.11	0.8	1.2	9.525	3.65	Yes	LTE R2020 LTE R2525	1
	TME 125R	16ER125ISO-TE	1.25	—	●	●	0.15	0.8	1.2	9.525	3.65	Yes		1
	TME 150R	16ER150ISO-TE	1.50	—	●	●	0.19	1.0	1.2	9.525	3.65	Yes		1
	TME 175R	16ER175ISO-TE	1.75	—	●	●	0.22	1.2	1.2	9.525	3.65	Yes		1
	TME 200R	16ER200ISO-TE	2.00	—	●	●	0.26	1.4	1.2	9.525	3.65	Yes		1
	TME 250R	16ER250ISO-TE	2.50	—	●	●	0.33	1.4	1.2	9.525	3.65	Yes		1
	TME 300R	16ER300ISO-TE	3.00	—	●	●	0.40	1.8	1.2	9.525	3.65	Yes		1
	TME 350R	22ER350ISO-TE	3.50	—	●	●	0.47	2.5	1.7	12.70	4.60	Yes	LTE R2525M22	1
	TME 400R	22ER400ISO-TE	4.00	—	●		0.54	2.5	1.7	12.70	4.60	Yes	LTE R3232P22	1
	TME 1020R	16ER102060-TE	1.00 to 2.00	24 to 12	●	●	0.11	1.1	1.2	9.525	3.65	No		1
	TME 1530R	16ER153060-TE	1.50 to 3.00	16 to 8	●	●	0.19	1.6	1.0	9.525	3.65	No		1
55° Whitworth Thread	**TWE 1410R**	16ER141055-TE	—	14 to 10	●		0.21	1.4	1.2	9.525	3.65	No		1
	TWE 2416R	16ER241655-TE	—	24 to 16	●		0.11	1.1	1.2	9.525	3.65	No		1
60° Unified Thread	**TUE 24R**	16ER24UN-TE	—	24	●		0.12	0.8	1.2	9.525	3.65	Yes		1
	TUE 20R	16ER20UN-TE	—	20			0.15	0.8	1.2	9.525	3.65	Yes		1
	TUE 18R	16ER18UN-TE	—	18			0.17	1.0	1.2	9.525	3.65	Yes		1
	TUE 16R	16ER16UN-TE	—	16	●		0.20	1.2	1.2	9.525	3.65	Yes	LTE R2020 LTE R2525	1
	TUE 14R	16ER14UN-TE	—	14	●		0.23	1.2	1.2	9.525	3.65	Yes		1
	TUE 12R	16ER12UN-TE	—	12	●		0.28	1.4	1.2	9.525	3.65	Yes		1
	TUE 08R	16ER08UN-TE	—	8			0.43	1.8	1.2	9.525	3.65	Yes		1
55° Taper Thread for Pipe	**TPE 28R**	16ER28BSPT-TE	—	28			0.09	0.9	0.7	9.525	3.65	Yes		1
	TPE 19R	16ER19BSPT-TE	—	19	●		0.15	0.9	0.7	9.525	3.65	Yes		1
	TPE 14R	16ER14BSPT-TE	—	14	●		0.22	1.6	1.2	9.525	3.65	Yes		1
	TPE 11R	16ER11BSPT-TE	—	11	●		0.29	1.6	1.2	9.525	3.65	Yes		1

For these inserts, only LTE/STE type holders can be used.

SEC-External Threading Tool Holders STE series

External

External Turning
Screw-on / Lever Lock

STE
External Threading

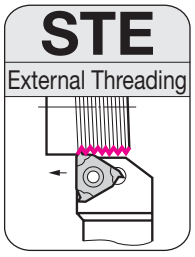
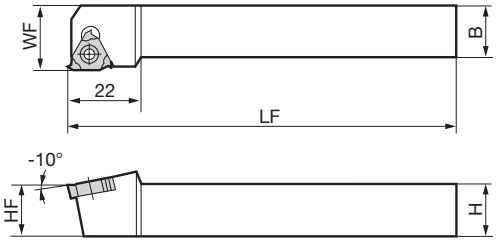


Fig 1



- M Metric Thread
- W Whitworth Thread
- UNC/UNF Unified Thread
- R/Rc Taper Thread for Pipe

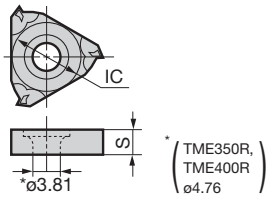
Holder

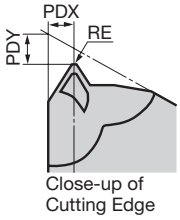
Parts

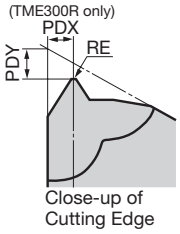
Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Flat Head Screw	N·m	Wrench
STE R1212	●	12	12	100	16	12	1	BFTX03508	2.0	TRX10
STE R1616	●	16	16	100	20	16	1			

Fig 1







Inserts (Cermet)

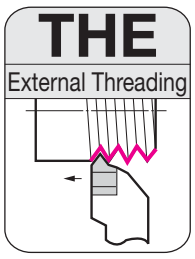
Dimensions (mm)

Type	Cat. No.	Reference Cat. No.	Pitch mm	Pitch Threads/Inch	T1500A	T130A	Corner Radius RE	X Direction PDX	Y Direction PDY	Inscribed Circle IC	Thickness S	Wiper Edge	Applicable Holder	Fig
60° Metric Thread	**TME 100R**	16ER100ISO-TE	1.00	—	●	●	0.11	0.8	1.2	9.525	3.65	Yes	STE R1212 STE R1616	1
	TME 125R	16ER125ISO-TE	1.25	—	●	●	0.15	0.8	1.2	9.525	3.65	Yes		1
	TME 150R	16ER150ISO-TE	1.50	—	●	●	0.19	1.0	1.2	9.525	3.65	Yes		1
	TME 175R	16ER175ISO-TE	1.75	—	●	●	0.22	1.2	1.2	9.525	3.65	Yes		1
	TME 200R	16ER200ISO-TE	2.00	—	●	●	0.26	1.4	1.2	9.525	3.65	Yes		1
	TME 250R	16ER250ISO-TE	2.50	—	●	●	0.33	1.4	1.2	9.525	3.65	Yes		1
	TME 300R	16ER300ISO-TE	3.00	—	●	●	0.40	1.8	1.2	9.525	3.65	Yes		1
	TME 1020R	16ER102060-TE	1.00 to 2.00	24 to 12	●	●	0.11	1.1	1.2	9.525	3.65	No		1
	TME 1530R	16ER153060-TE	1.50 to 3.00	16 to 8	●	●	0.19	1.6	1.0	9.525	3.65	No		1
55° Whitworth Thread	**TWE 1410R**	16ER141055-TE	—	14 to 10	●		0.21	1.4	1.2	9.525	3.65	No		1
	TWE 2416R	16ER241655-TE	—	24 to 16	●		0.11	1.1	1.2	9.525	3.65	No		1
60° Unified Thread	**TUE 24R**	16ER24UN-TE	—	24	●		0.12	0.8	1.2	9.525	3.65	Yes		1
	TUE 20R	16ER20UN-TE	—	20			0.15	0.8	1.2	9.525	3.65	Yes		1
	TUE 18R	16ER18UN-TE	—	18			0.17	1.0	1.2	9.525	3.65	Yes		1
	TUE 16R	16ER16UN-TE	—	16	●		0.20	1.2	1.2	9.525	3.65	Yes		1
	TUE 14R	16ER14UN-TE	—	14	●		0.23	1.2	1.2	9.525	3.65	Yes		1
	TUE 12R	16ER12UN-TE	—	12	●		0.28	1.4	1.2	9.525	3.65	Yes		1
	TUE 08R	16ER08UN-TE	—	8			0.43	1.8	1.2	9.525	3.65	Yes		1
55° Taper Thread for Pipe	**TPE 28R**	16ER28BSPT-TE	—	28			0.09	0.9	0.7	9.525	3.65	Yes		1
	TPE 19R	16ER19BSPT-TE	—	19	●		0.15	0.9	0.7	9.525	3.65	Yes		1
	TPE 14R	16ER14BSPT-TE	—	14	●		0.22	1.6	1.2	9.525	3.65	Yes		1
	TPE 11R	16ER11BSPT-TE	—	11	●		0.29	1.6	1.2	9.525	3.65	Yes		1

For these inserts, only LTE/STE type holders can be used.

External

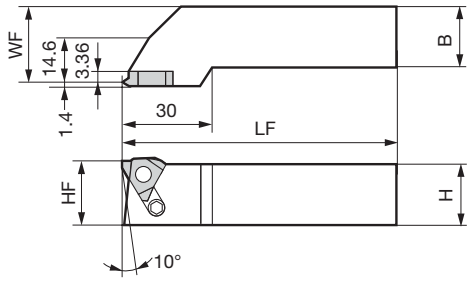
THE
External Threading



External Turning
Screw-on / Drawing Pin

M Metric Thread
W Whitworth Thread
R/Rc Taper Thread for Pipe

Fig 1



Holder

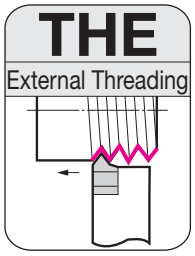
Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Drawing Pin	Set Screw	Wrench
THE R-33	●	20	20	125	25.0	20	1	SR124	BTD0510	LH025
THE R-44	●	25	25	150	32.2	25	1			

External

THE
External Threading

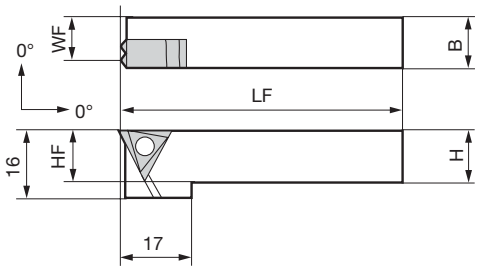


Screw-on / Drawing Pin for SEC-External Diameter (Mini Holders)

M Metric Thread
W Whitworth Thread
R/Rc Taper Thread for Pipe

SumiSmall

Fig 1



Holder

Parts

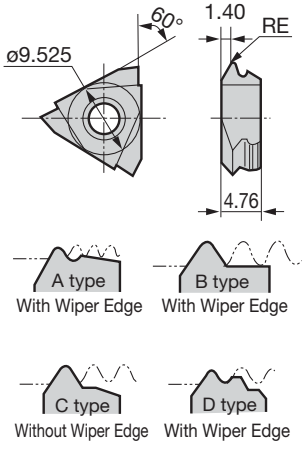
Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Flat Head Screw	Wrench
THE R1010-33	●	10	10	100	8.6	10	1	BFX0410R	TH025
THE R1212-33	●	12	12	100	10.6	12	1		

Inserts (Cermet / Cemented Carbide)

Dimensions (mm)

Cat. No.	T1500A	ST10P	A30	Pitch mm	Pitch Threads/Inch	Corner Radius RE	Included Angle PNA	Cutting edge design	Applicable Holder
NE R080		●	●	0.80	—	0.08	60	A	THE R-33 THE R-44 THE R1010-33 THE R1212-33
NE R100		●	●	1.00	—	0.11	60	A	
NE R125		●	●	1.25	—	0.15	60	B	
NE R150		●	●	1.50	—	0.18	60	B	
NE R175		●	●	1.75	—	0.22	60	B	
NE R200		●	●	2.00	—	0.25	60	B	
NE R250		●	●	2.50	—	0.33	60	B	
NE R0815	●	●	●	0.80 to 1.50	—	0.08	60	C	
NE R1530	●	●	●	1.50 to 3.00	—	0.18	60	C	
WE R1410	●			—	14 to 10	0.21	55	C	
WE R2416	●			—	24 to 16	0.11	55	C	
PTE R28				—	28	0.09	55	D	
PTE R19				—	19	0.15	55	D	



Internal Threading Tools STI series

Internal

Internal Boring
Screw-on

M Metric Thread
UNC/UNF Unified Thread

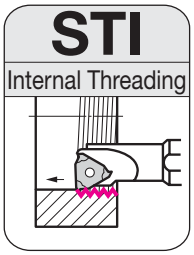
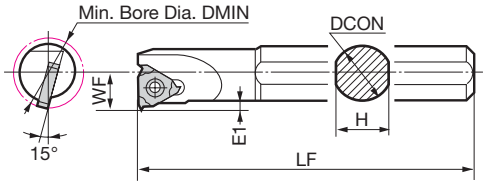


Fig 1



Holder

Parts

Dimensions (mm)

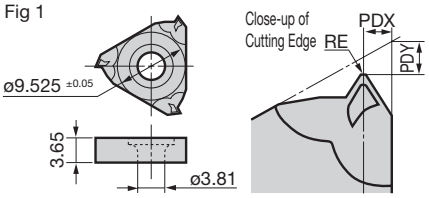
Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Distance E1	Min. Bore Dia. DMIN	Fig	Flat Head Screw	N·m	Wrench
STI R316	●	16	15	150	11	3.5	20	1	BFTX03508	2.0	TRX10
STI R320	●	20	18	180	14	5.0	25	1			

Inserts (Cermet)

Dimensions (mm)

Cat. No.	Reference Cat. No.	Pitch mm	Pitch Threads/Inch	T1500A	Corner Radius RE	Included Angle PNA	X Direction PDX	Y Direction PDY	Fig
TMI 100R	16IR100ISO-TI	1.00	—	●	0.04	60	0.8	1.2	1
TMI 125R	16IR125ISO-TI	1.25	—	●	0.05	60	0.8	1.2	1
TMI 150R	16IR150ISO-TI	1.50	—	●	0.07	60	1.0	1.2	1
TMI 175R	16IR175ISO-TI	1.75	—	●	0.09	60	1.2	1.2	1
TMI 200R	16IR200ISO-TI	2.00	—	●	0.10	60	1.4	1.2	1
TMI 250R	16IR250ISO-TI	2.50	—	●	0.14	60	1.4	1.2	1
TMI 300R	16IR300ISO-TI	3.00	—	●	0.18	60	1.8	1.2	1
TMI 1020R	16IR102060-TI	1.00 to 2.00	24 to 12	●	0.04	60	1.0	1.2	1
TMI 1530R	16IR153060-TI	1.50 to 3.00	16 to 8	●	0.07	60	1.5	1.2	1

Fig 1



For these inserts, only STI type holders can be used.

STHI series

Internal

Internal Boring
Screw-on

M Metric Thread

SumiSmall

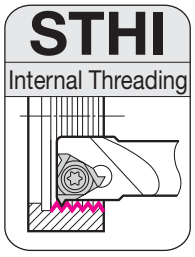
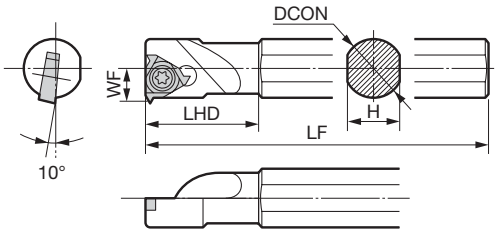


Fig 1



Holder

Parts

Dimensions (mm)

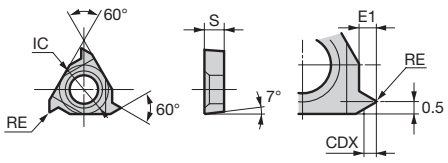
Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Head LHD	Min. Bore Dia.	Applicable Insert	Fig	Flat Head Screw	Wrench
STHI 06	●	6	5.5	100	3.8	13.0	8.0	TI R06	1	BFTX0204NS	RT06
STHI 08	●	8	7.0	125	4.7	17.0	10.0	TI R08	1	BFTX0205NS	
STHI 10	●	10	9.0	150	6.0	20.0	12.0	TI R09	1	BFTX02206NT	

Insert (Coated Carbide)

Dimensions (mm)

Cat. No.	Reference Cat. No.	ACZ150	Pitch (mm)	Corner Radius RE	Inscribed Circle IC	Thickness S	Cutting Edge Distance E1	Maximum Depth of Cut CDX	Applicable Holder	Fig
TI R06	06IR041060-HI	●	0.4 to **0.5** to 1.0	0.03	3.97	1.59	0.7	0.5	STHI06	1
TI R08	08IR041060-HI	●	0.4 to **0.5** to 1.0	0.03	4.76	2.38	0.7	0.5	STHI08	1
TI R09	09IR041060-HI	●	0.4 to **0.5** to 1.0	0.03	5.56	2.38	0.7	0.5	STHI10	1

Fig 1



· For these inserts, only STHI type holders can be used.
· Recommended pitch is 0.5mm.

Recommended Cutting Conditions A24

THI series

Internal

Internal Boring
Clamp-on

M Metric Thread

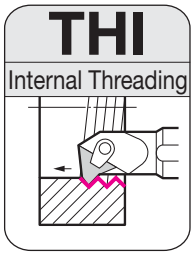
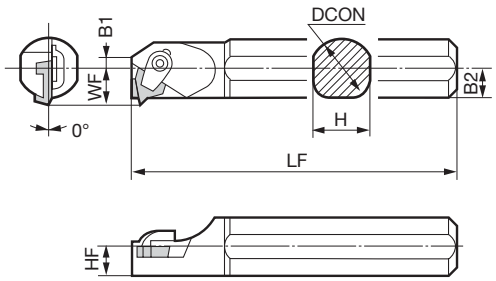


Fig 1



Holder

Parts

Dimensions (mm)

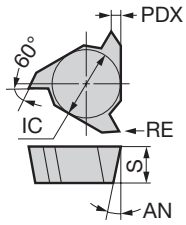
Cat. No.	Stock	Diameter DCON	Height H	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Width B1	Width B2	Min. Pilot Hole Diameter	Applicable Insert	Fig	Clamp Plate	Double Screw	Wrench
														TH025 LH030
THI R216	●	16	15	160	9.3	7.5	4	7.5	ø18	NI R2○○○	1	CCM5BSL	WB5-10	TH025
THI R320	●	20	18	160	11.7	9.0	6	9.0	ø22	NI R3○○○	1		WB5-12	
THI R325	●	25	23	180	14.2	11.5	5	11.5	ø27	NI R3○○○	1	CCM6BL	WB6-16	LH030

Inserts (□ Cemented Carbide)

Dimensions (mm)

Cat. No.	ST10P	Pitch (mm)	Inscribed Circle IC	Thickness S	X Direction PDX	Corner Radius RE	Main Blade Relief Angle AN	Cutting edge design	Applicable Holder	Fig
NI R2000	●	0.8 to 1.5	6.350	3.18	0.85	0.05	12	C	THI R216	1
NI R2150	●	1.5	6.350	3.18	0.85	0.07	12	B		1
NI R3000	●	0.8 to 2.5	9.525	3.18	1.35	0.05	10	C	THI R320	1
NI R3150	●	1.5	9.525	3.18	0.85	0.07	10	B	THI R325	1
NI R3200	●	2.0	9.525	3.18	1.10	0.11	10	B		1

Fig 1



B type
With Wiper Edge

C type
Without Wiper Edge

· The cutting edge honing of the inserts can be enlarged for threading at a pitch of 1.5mm or more with the NIR2000 and a pitch of 2.5mm or more with the NIR3000. The honing amount must be within the threading tolerance.
· Inserts use 3 corners.

Guide to Depth of Cut and No. of Passes

Threading Tool Depth of Cut Guide

■ With Wiper Edge

Applications		Cat. No.	Reference Cat. No.	Pitch	Depth of Cut	No. of Passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14
60° Metric Thread	External Threading	**TME 100R**	16ER 100ISO-TE	1.00mm	0.68	5	0.20	0.16	0.14	0.11	0.07									
		TME 125R	16ER 125ISO-TE	1.25	0.83	6	0.20	0.18	0.15	0.12	0.11	0.07								
		TME 150R	16ER 150ISO-TE	1.50	0.96	7	0.22	0.18	0.14	0.13	0.12	0.10	0.07							
		TME 175R	16ER 175ISO-TE	1.75	1.12	8	0.22	0.19	0.16	0.14	0.13	0.12	0.09	0.07						
		TME 200R	16ER 200ISO-TE	2.00	1.25	8	0.25	0.21	0.18	0.16	0.15	0.13	0.10	0.07						
		TME 250R	16ER 250ISO-TE	2.50	1.55	10	0.27	0.24	0.20	0.18	0.16	0.13	0.11	0.10	0.09	0.07				
		TME 300R	16ER 300ISO-TE	3.00	1.85	12	0.28	0.25	0.20	0.19	0.17	0.15	0.13	0.12	0.10	0.10	0.09	0.07		
		TME 350R	22ER 350ISO-TE	3.50	2.25	13	0.30	0.27	0.24	0.22	0.20	0.18	0.16	0.15	0.14	0.12	0.11	0.09	0.07	
		TME 400R	22ER 400ISO-TE	4.00	2.57	14	0.35	0.32	0.29	0.26	0.23	0.20	0.17	0.15	0.14	0.12	0.10	0.09	0.08	0.07
	Internal Threading	**TMI 100R**	16IR 100ISO-TI	1.00mm	0.63	5	0.18	0.16	0.12	0.10	0.07									
		TMI 125R	16IR 125ISO-TI	1.25	0.77	6	0.18	0.16	0.14	0.12	0.10	0.07								
		TMI 150R	16IR 150ISO-TI	1.50	0.90	7	0.20	0.16	0.14	0.13	0.11	0.09	0.07							
		TMI 175R	16IR 175ISO-TI	1.75	1.03	8	0.20	0.18	0.15	0.14	0.11	0.10	0.08	0.07						
		TMI 200R	16IR 200ISO-TI	2.00	1.18	8	0.22	0.19	0.17	0.15	0.14	0.13	0.11	0.07						
		TMI 250R	16IR 250ISO-TI	2.50	1.44	10	0.25	0.22	0.19	0.16	0.14	0.12	0.10	0.10	0.09	0.07				
		TMI 300R	16IR 300ISO-TI	3.00	1.70	12	0.27	0.24	0.20	0.17	0.14	0.12	0.12	0.10	0.10	0.09	0.08	0.07		
60° Unified Thread	External Threading	**TUE 24R**	16ER 24UN-TE	24TPI	0.72	5	0.20	0.18	0.15	0.12	0.07									
		TUE 20R	16ER 20UN-TE	20	0.85	6	0.21	0.18	0.16	0.13	0.10	0.07								
		TUE 18R	16ER 18UN-TE	18	0.95	6	0.22	0.20	0.18	0.16	0.12	0.07								
		TUE 16R	16ER 16UN-TE	16	1.05	7	0.22	0.20	0.17	0.15	0.13	0.11	0.07							
		TUE 14R	16ER 14UN-TE	14	1.20	8	0.22	0.20	0.18	0.16	0.14	0.12	0.11	0.07						
		TUE 12R	16ER 12UN-TE	12	1.38	9	0.25	0.22	0.19	0.17	0.15	0.13	0.11	0.09	0.07					
		TUE 08R	16ER 08UN-TE	8	2.05	12	0.28	0.25	0.23	0.21	0.19	0.17	0.15	0.14	0.13	0.12	0.11	0.07		
55° Taper Thread for Pipe	External Threading	**TPE 28R**	16ER 28BSPT-TE	28TPI	0.62	5	0.18	0.15	0.13	0.10	0.06									
		TPE 19R	16ER 19BSPT-TE	19	0.92	6	0.22	0.20	0.17	0.15	0.11	0.07								
		TPE 14R	16ER 14BSPT-TE	14	1.04	7	0.22	0.20	0.17	0.15	0.13	0.10	0.07							
		TPE 11R	16ER 11BSPT-TE	11	1.50	9	0.25	0.22	0.21	0.19	0.17	0.15	0.13	0.11	0.07					

* When pitch becomes smaller, decrease the cutting speed. In the case of inserts for internal threading without wiper edge, the number of passes should be increased.

■ Recommended Cutting Speeds

(Units: m/min)

Work Material \ Tool Grade		T1500A / T130A	A30	ST10P
P	Mild Steel	100 - 150	70 - 120	120 - 180
P	Low-carbon Steel	80 - 130	70 - 100	90 - 150
P	Alloy Steel	80 - 120	70 - 100	80 - 130
M	Stainless Steel	—	70 - 100	—

Guide to Depth of Cut and No. of Passes

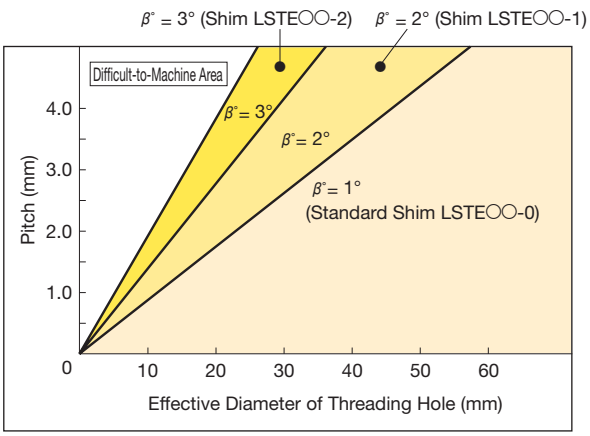
Threading Tool Depth of Cut Guide

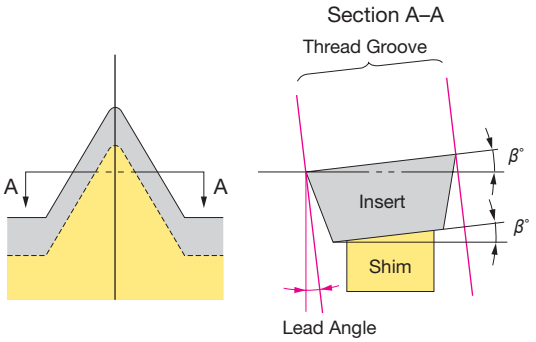
■ Without Wiper Edge

Applications		Cat. No.	Reference Cat. No.	Corner Radius	Pitch	Depth of Cut	No. of Passes	1	2	3	4	5	6	7	8	9	10	11	12	13	14
60° Metric Thread	External Threading	**TME 1020R**	16ER 102060-TE	0.13	1.00mm	0.65	5	0.20	0.16	0.12	0.10	0.07									
					1.25	0.84	6	0.20	0.18	0.16	0.13	0.10	0.07								
					1.50	1.03	7	0.22	0.20	0.17	0.15	0.12	0.10	0.07							
					1.75	1.22	8	0.22	0.21	0.18	0.16	0.15	0.13	0.10	0.07						
					2.00	1.41	10	0.22	0.20	0.18	0.16	0.14	0.13	0.12	0.10	0.09	0.07				
		TME 1530R	16ER 153060-TE	0.20	1.50mm	0.95	7	0.22	0.17	0.14	0.13	0.12	0.10	0.07							
					1.75	1.14	8	0.22	0.18	0.16	0.15	0.14	0.12	0.10	0.07						
					2.00	1.33	9	0.25	0.20	0.18	0.16	0.15	0.13	0.10	0.09	0.07					
					2.50	1.71	12	0.25	0.22	0.19	0.17	0.15	0.14	0.13	0.12	0.10	0.09	0.08	0.07		
					3.00	2.09	14	0.25	0.22	0.20	0.20	0.18	0.17	0.15	0.14	0.14	0.10	0.10	0.09	0.08	0.07
	Internal Threading	**TMI 1020R**	16IR 102060-TI	0.06	1.00mm	0.59	6	0.16	0.12	0.10	0.08	0.08	0.05								
					1.25	0.75	7	0.16	0.14	0.12	0.10	0.10	0.08	0.05							
					1.50	0.92	8	0.18	0.15	0.14	0.12	0.10	0.10	0.08	0.05						
					1.75	1.08	9	0.18	0.16	0.14	0.13	0.12	0.12	0.10	0.08	0.05					
					2.00	1.24	10	0.20	0.18	0.15	0.14	0.12	0.12	0.10	0.10	0.08	0.05				
		TMI 1530R	16IR 153060-TI	0.09	1.50mm	0.91	8	0.18	0.14	0.14	0.12	0.10	0.10	0.08	0.05						
					1.75	1.07	9	0.18	0.16	0.13	0.13	0.12	0.12	0.10	0.08	0.05					
					2.00	1.23	10	0.20	0.18	0.14	0.14	0.12	0.12	0.10	0.10	0.08	0.05				
					2.50	1.56	12	0.20	0.18	0.16	0.16	0.15	0.13	0.13	0.11	0.11	0.10	0.08	0.05		
					3.00	1.88	14	0.22	0.20	0.18	0.18	0.16	0.16	0.14	0.14	0.10	0.10	0.10	0.08	0.07	0.05
55° Whitworth Thread	External Threading	**TWE 2416R**	16ER 241655-TE	0.13	20TPI	0.80	6	0.20	0.17	0.15	0.12	0.09	0.07								
					19	0.84	6	0.20	0.18	0.16	0.13	0.10	0.07								
					18	0.90	7	0.20	0.18	0.15	0.12	0.10	0.08	0.07							
					16	1.03	7	0.22	0.20	0.17	0.15	0.12	0.10	0.07							
					14TPI	1.07	8	0.20	0.17	0.15	0.14	0.13	0.12	0.09	0.07						
		TWE 1410R	16ER 141055-TE	0.23	12	1.29	9	0.22	0.20	0.17	0.15	0.14	0.13	0.12	0.09	0.07					
					11	1.43	10	0.22	0.21	0.18	0.16	0.14	0.13	0.12	0.11	0.09	0.07				
					10	1.60	11	0.22	0.21	0.18	0.17	0.16	0.14	0.13	0.12	0.11	0.09	0.07			

* When pitch becomes smaller, decrease the cutting speed. In the case of inserts for internal threading without wiper edge, the number of passes should be increased.

■ Shim Selection for External Threading Tool LTE type Holder





Standard shim that comes with LTE has β° = 1°.
β° = 2°, 3° shims are sold separately.
STE and STI type holders do not come with shims.

Tooling Systems Cartridges G1 to G27

G

General Features of Tooling Systems ····· G2
ICTM HSK Tooling System ····· G3
Polygonal Taper Shank SumiPolygon ····· G8
2 Locating Faces Modular Taper Shank ····· G18
2 Locating Faces HSK Tooling System ····· G18
Smart Damper™ for Milling ····· G20
IGETALLOY ABS System ····· G22
SEC-Micro Units ····· G24
Expansion SEC-Cartridge Units ····· G25
Boring Quills / Carbide Line Boring Bars ····· G27

Stock Markings and Symbols

● ● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

General Features of Tooling Systems

■ Tooling Systems

Application	System Name		Feature	Ref. Page
Turning	ICTM STANDARD HSK Tooling System		Shanks for turning applications in multi-tasking machines, conforming to the ICTM (Interface Committee for Turning Mill) Standard. Compatible with HSK-A type, tools can be shared between multi-tasking machines and machining centres. Compliant with ISO standard ISO12164-3:2008.	G3 ~
Turning / Milling	Polygon Taper Shank SumiPolygon		Polygonal keyless coupling system achieves an indexing accuracy of ±2μm. Supports both turning and rotating tools. Compliant with ISO standard ISO26623-1:2008.	G8 ~
Milling	Modular Taper Shank		Achieving high-precision machining by increasing rigidity at high-speed rotations with two locating faces on the taper and flange, along with an excellent clamping mechanism. Compliant with ISO standard ISO 26622-1:2008.	G18
Milling	HSK Tooling System		The ISO standard for milling shanks with 2 locating faces.	G18
Milling	Smart Damper™		A special anti-vibration mechanism is built in to realize high-efficiency and high quality machining with a long overhang.	G20 ~
Milling	IGETALLOY ABS System		This quick change system for round tools uses an unique mechanism with a strong holding force. The system offers high rigidity and precision, and exhibits good indexing accuracy during tool changes.	G22 ~

HSK Tooling System

ICTM STANDARD

■ Features

The HSK tooling system has been adopted by Japan's 17 major machine tool manufacturers as the interface for turning tools in multi-tasking machines. It is based on the ICTM (Interface Committee for Turning Mill) standard.
Based on the ISO standard HSK shank, this system is designed to improve precision in turning applications, and is compatible with the HSK-A type that is widely use on machining centres.

* Catalogue numbers have been changed due to ISO standardisation (ISO 12164-3:2008).

For support with non-standard specifications, contact us directly.

General External Turning and Profiling
Double Clamp

DCLN

General Turning and Facing

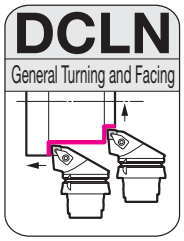


Fig 1

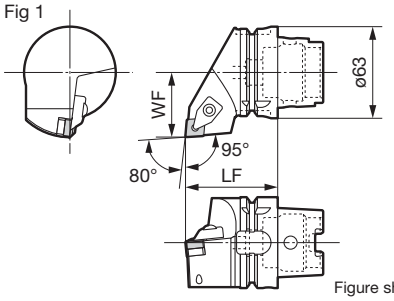
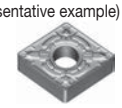


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
CN□□1204○○	B16 ~

(Representative example)



CNMG120408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Overhang LF	Cutting Edge WF	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Wrench
HSK63TH-DCLN R/L-DX12	H63A-WH-DCLN R/L-DX12			65	45	1	SCP-2	**5.0**	CNS1204	BFTX0409N	TRX15(*)	LH040

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

General External Turning and Profiling
Double Clamp

DCMN

General Turning and Facing

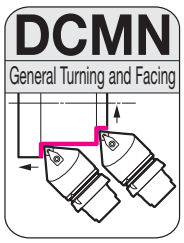
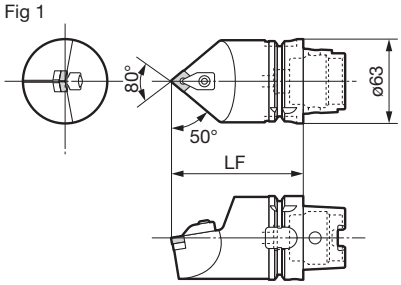


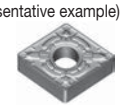
Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
CN□□1204○○	B16 ~

(Representative example)



CNMG120408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock	Overhang LF	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Wrench
HSK63TH-DCMN N-H12	H63A-WH-DCMN N-H12		100	1	SCP-2	**5.0**	CNS1204	BFTX0409N	TRX15(*)	LH040
HSK63TH-DCMN N-L12	H63A-WH-DCMN N-L12		140	1						

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

N·m Recommended Tightening Torque (N·m)

HSK Tooling System

General External Turning and Profiling
Double Clamp

DDJN
External Turning and Profiling

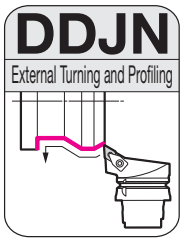


Fig 1

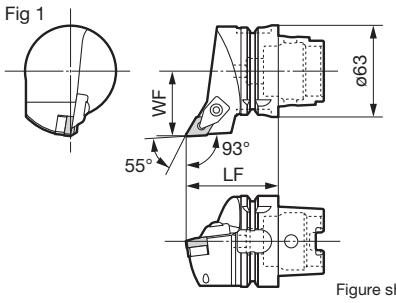


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
DN□□1504○○	B25 ~

(Representative example)

DNMG150408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Overhang LF	Cutting Edge WF	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim	Wrench
HSK63TH-DDJN R/L-DX15	H63A-WH-DDJN R/L-DX15			65	45	1	SCP-2	5.0	DNS1504	BFTX0409N	TRX15(*)	LH040

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

General External Turning and Profiling
Double Clamp

DDNN
External Turning and Profiling

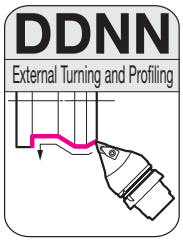
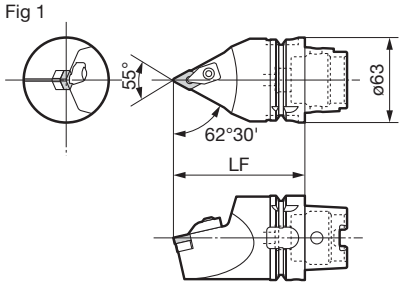


Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
DN□□1504○○	B25 ~

(Representative example)

DNMG150408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock	Overhang LF	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim	Wrench
HSK63TH-DDNN N-H15	H63A-WH-DDNN N-H15		100	1	SCP-2	5.0	DNS1504	BFTX0409N	TRX15(*)	LH040
HSK63TH-DDNN N-L15	H63A-WH-DDNN N-L15		140	1						

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

General External Turning and Profiling
Double Clamp

DVPN
Necking

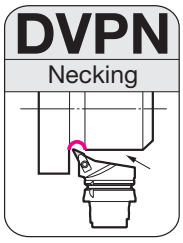


Fig 1

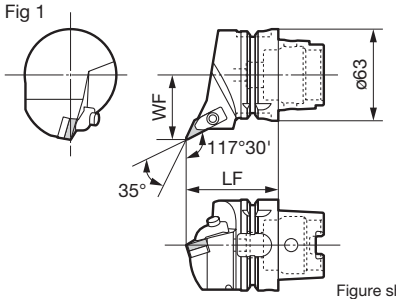


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
VN□□1604○○	B60 ~

(Representative example)

VNMG 160408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Overhang LF	Cutting Edge WF	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim	Wrench
HSK63TH-DVPN R/L-DX16	H63A-WH-DVPN R/L-DX16			65	45	1	SCP-4	5.0	VNS1604	BFTX0307N	TRX10(*)	LH040

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

N·m Recommended Tightening Torque (N·m)

General External Turning and Profiling
Double Clamp

DVVN
External Turning and Profiling

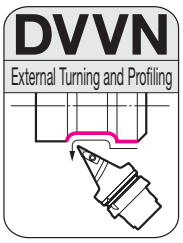
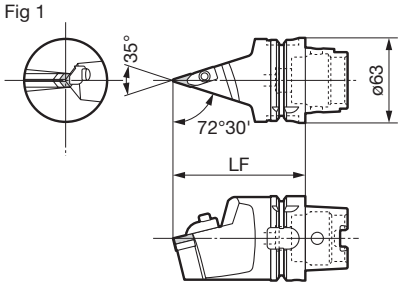


Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
VN□□1604○○	B60 ~

(Representative example)

VNMG 160408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock	Overhang LF	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Wrench
HSK63TH-DVVN N-H16	H63A-WH-DVVN N-H16		100	1	SCP-4	5.0	VNS1604	BFTX0307N	TRX10(*)	LH040

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

General External Turning and Profiling
Screw-on

SVVC
External Turning and Profiling

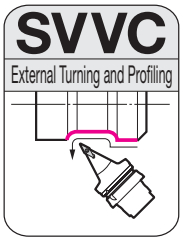
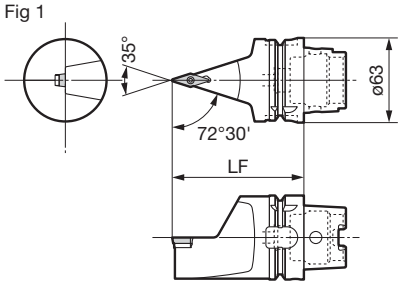


Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
VC□□1604○○	B122 ~

(Representative example)

VCMT160404N-SU

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock	Overhang LF	Fig	Pin	Nut	Shim	Flat Insert Screw	Wrench for Shim	Wrench
HSK63TH-SVVC N-H16	H63A-WH-SVVCN-H16		100	1	VP25	CPV33N	SVP32	BFTX03508	TRX10(*)	LH025
HSK63TH-SVVC N-L16	H63A-WH-SVVCN-L16		140	1						

*Wrench for shim is sold separately from the main body.

General External Turning and Profiling
Screw-on

SVPC
Necking

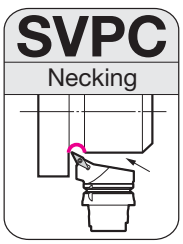


Fig 1

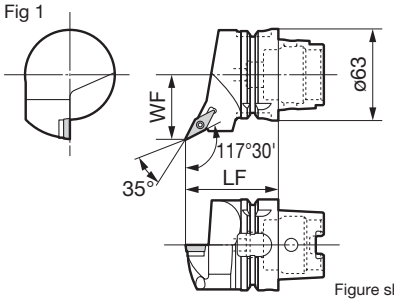


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
VC□□1604○○	B122 ~

(Representative example)

VCMT160404N-SU

Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock R	Stock L	Overhang LF	Cutting Edge WF	Fig	Pin	Nut	Shim	Flat Insert Screw	Wrench for Shim	Wrench
HSK63TH-SVPC R/L-DX16	H63A-WH-SVPCL-DX16			65	45	1	VP20	CPV33N	SVP32	BFTX03508	TRX10(*)	LH025

*Wrench for shim is sold separately from the main body.

HSK Tooling System

General External Turning and Profiling
Double Clamp

DTR
External Turning and Profiling

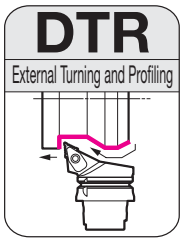
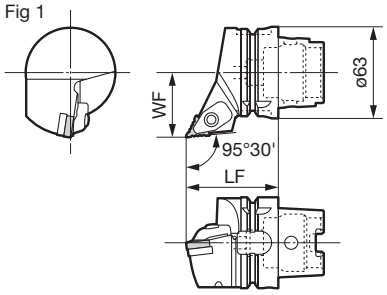


Fig 1



SumiTurn T-REX

Insert

Applicable Insert Cat. No.	Ref. Page
TRM5517○○	C18

(Representative example)

TRM551708-LU

Holder

Parts

Dimensions (mm)

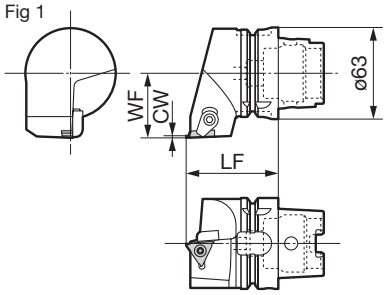
Cat. No.	Previous Cat. No.	Stock	Overhang LF	Cutting Edge WF	Fig	Clamp Plate	Spring	Cap Screw	Cap Screw N·m	Shim	Shim Screw	Wrench	Wrench for Shim
HSK63TH-DTR55C R-DX17	H63A-WH-DTR55C R-DX17		65	45	1	TRCP3	S-SP4-20	BX0520	3.5 to 4.5	TRW5505	BFTX0307N	TSW040	TRX10(*)

*Wrench for shim is sold separately from the main body.
Refer to TRM series inserts on C18 for applicable inserts.

External Grooving
Double Clamp

GWC
External Grooving

Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
TGAR4○○○□	F6 to F7
TGAR4○○○BF	F8

(Representative example)

TGAR4150

Holder

Parts

Dimensions (mm)

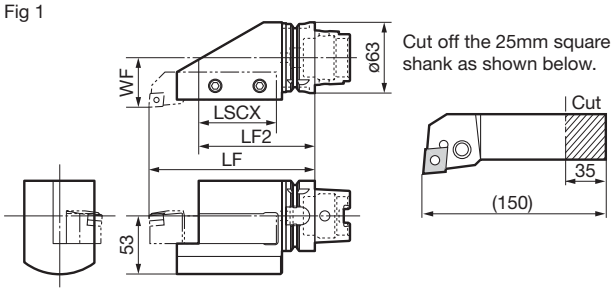
Cat. No.	Previous Cat. No.	Stock	Overhang LF	Cutting Edge WF	Width of Cut CW	Group No.	Fig	Flat Insert Screw	Flat Insert Screw N·m	Clamp Plate	Double Screw	Wrench	Wrench
HSK63TH-GWC R-DX412	H63A-WH-GWC R-DX412		65	45	1.25 to 1.45	2	1						
HSK63TH-GWC R-DX415	H63A-WH-GWC R-DX415		65	45	1.50 to 2.30	3	1	BFTX0511N	5.0	CCM8UL	WB8-22T	TRX20	LT27
HSK63TH-GWC R-DX425	H63A-WH-GWC R-DX425		65	45	2.50 to 4.80	4	1						

Refer to TGA series insert group numbers on F6, F7 and F8 for applicable inserts. Select applicable inserts for the holders by using matching group numbers.

N·m Recommended Tightening Torque (N·m)

Square Shank Holder

Fig 1



Holder

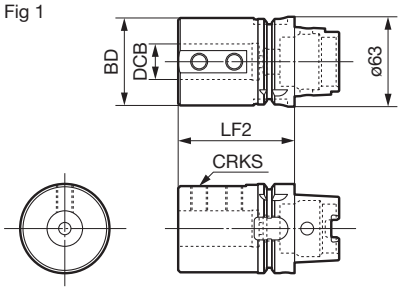
Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock	Overhang LF	Overhang LF2	Clamping Length LSCX	Cutting Edge WF	Fig	Set Screw	Wrench
HSK63TH-S2525 R-105	H63A-WH-S2525 R-105		150	105	70	45	1	BTD0809	LH040

Holder for Boring Bar

Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Previous Cat. No.	Stock	Shank Dia. DCB	Body Dia. BD	Min. Clamping Length LF2	Screw CRKS	Fig	Set Screw	Wrench
HSK63TH-C08-65	H63A-WH-C08-65		8	28	65	M8	1	BTD0809	LH040
HSK63TH-C10-70	H63A-WH-C10-70		10	35	70	M8	1	BTD0812	
HSK63TH-C12-70	H63A-WH-C12-70		12	42	70	M8	1		
HSK63TH-C16-75	H63A-WH-C16-75		16	48	75	M10	1	BTD1015	LH050
HSK63TH-C20-75	H63A-WH-C20-75		20	52	75	M10	1		
HSK63TH-C25-83	H63A-WH-C25-83		25	62	83	M12	1	BTD1218	LH060
HSK63TH-C32-87	H63A-WH-C32-87		32	62	87	M12	1	BTD1215	
HSK63TH-C40-97	H63A-WH-C40-97		40	65	97	M16	1	BTD1610	LH080

Cut the boring bar to fit.

SumiPolygon

■ Features

SumiPolygon is a keyless coupling with a characteristic polygonal shape, which bear cutting torque evenly on three surfaces, providing high rigidity and high indexing accuracy.

For support with non-standard design specifications, contact us directly.

■ Features

● Sizes

· Supports shank sizes PSC32 (DCSFMS = 32mm) through PSC80 (DCSFMS = 80mm)

● High Rigidity and High Precision

· 1/20 polygon tapered shape supported on 2 faces for high rigidity

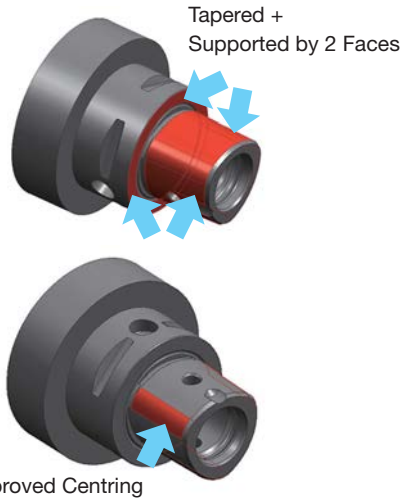
· Keyless coupling distributes cutting torque uniformly to 3 faces, reducing fluctuations in cutting edge height

· Repeatability when tools are changed is within ±2μm on all 3 axes

● Reduced Tool Change Time

· No need to change inserts on the machine, so the tool change time is significantly reduced

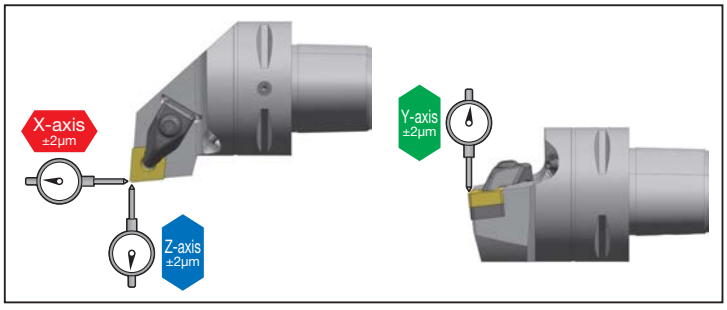
● Coupling Structure

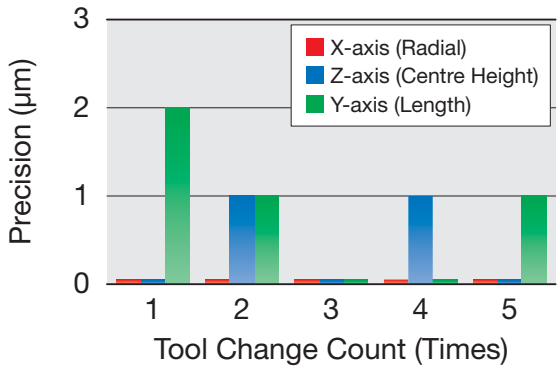


● Coolant supported (up to 1MPa)

■ Repetitive Accuracy

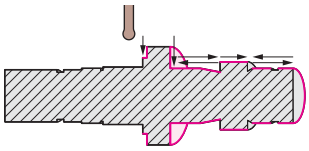
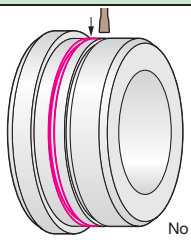
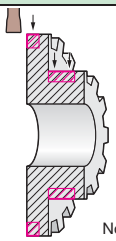
Repeatability when tools are changed is within ±2μm on all 3 axes: X-axis (Radial Direction) Y-axis (Centre Height Direction), Z-axis (Lengthwise Direction)





SumiPolygon

Application Examples

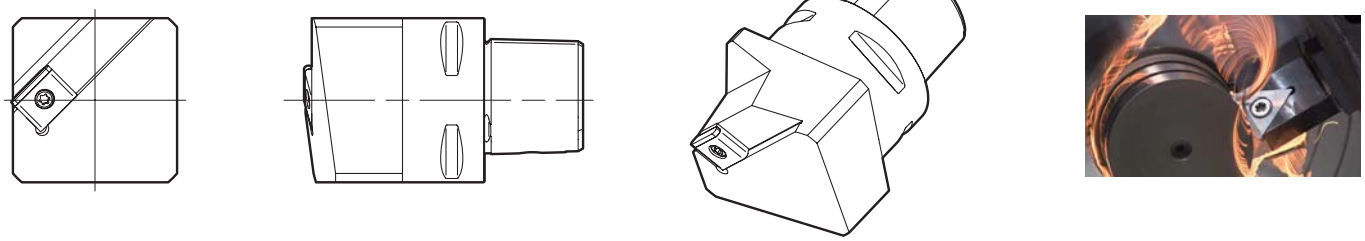
Nickel-Chromium Molybdenum Alloy Output Shaft Grooving	Stainless Steel Socket Joint Grooving	Sintered Alloy Sprocket Grooving/Facing
 No Abnormal Chatter or Vibration	 No Abnormal Chatter or Vibration	 No Abnormal Chatter or Vibration
Holders : PSC40 Special type Insert : GCMN4020-RG (AC425K) Cutting Conditions : vc = 120 to 140m/min, f = 0.2 to 0.35mm/rev ap = 2mm Wet	Holders : PSC40 Special type Insert : GCMN4008-MG (AC530U) Cutting Conditions : vc=100m/min, f=0.1mm/rev ap = 3mm Wet	Holders : PSC40 Special type Insert : Special Insert (Diameter 6.35mm) MG (AC530U) Cutting Conditions : Grooving vc = 180m/min, f = 0.16mm/rev, ap = 4mm x 2 passes Wet Facing vc = 190m/min, f = 0.18mm/rev, ap = 0.2mm Wet

Made-to-Order Product Design Example

For support with non-standard design specifications, contact us directly.

Hard Skiving Tool

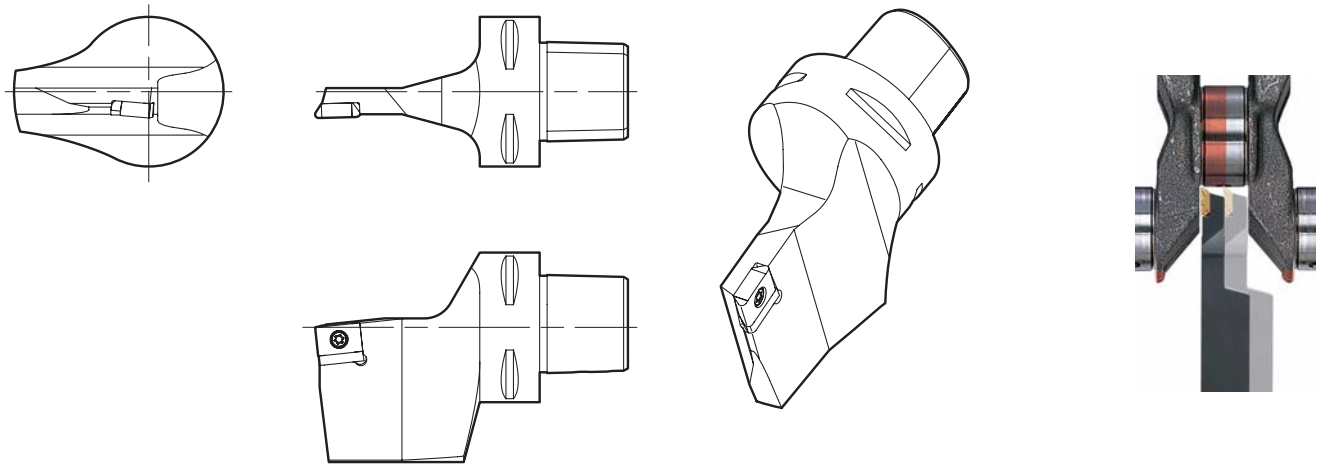
High-efficiency Hardened Steel Machining Tool



SEC-XD series Holders

For details on SEC-XD series Tool Holders (holders and inserts), see the separate "Tools for Machining Automotive Engine Parts" catalogue.

Tools for Crank Shaft Machining



SumiPolygon

External | C 80° | 95° 95° | Internal Coolant

External Turning
Double Clamp

DCLN

External Turning and Facing

Fig 1

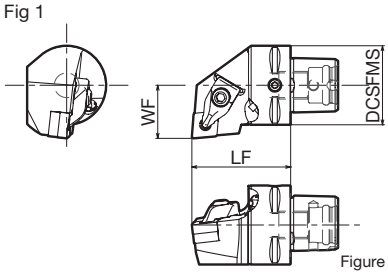


Figure shows right hand (R) tool

Insert

Applicable Insert Cat. No.	Ref. Page
CN□□1204○○	B16 ~

(Representative example)

CNMG120408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Coolant Nozzle
PSC40 DCLN R/L 27050-12	●	●	27	50	40	1	SCP-2	5.0	CNS1204	BFTX0409N	TRX15(*)	LH040	LH025	C4-CNZ
PSC50 DCLN R/L 35060-12	●	●	35	60	50	1								
PSC63 DCLN R/L 45065-12	●	●	45	65	63	1								

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

External | C 80° | 95° 95° | Internal Coolant

External Turning
Lever Lock

PCLN

External Turning and Facing

Fig 1

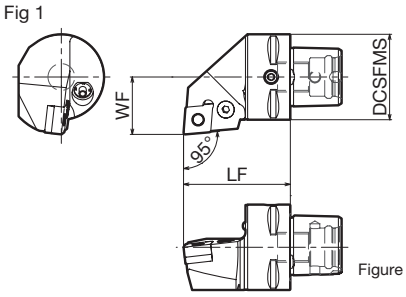
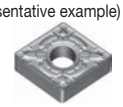


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
CN□□1204○○	B16 ~

(Representative example)



CNMG120408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Lever Pin	Set Screw	Shim	Shim Retainer	Wrench	Coolant Nozzle
PSC40 PCLN R/L 27050-12	●	●	27	50	40	1	LCL4	LCS4	LSC42	LSP4	LH030	C4-CNZ
PSC50 PCLN R/L 35060-12	●	●	35	60	50	1						
PSC63 PCLN R/L 45065-12	●	●	45	65	63	1						

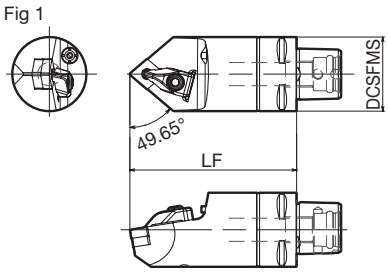
External | C 80° | 49.5° | Internal Coolant

External Turning
Double Clamp

DCMN

External Turning and Facing

Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
CN□□1204○○	B16 ~

(Representative example)

CNMG120408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Stock N	Overhang LF	Mounting DCSFMS	Fig	Clamp Set	Clamp Set N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Coolant Nozzle
PSC40 DCMN N 00090-12	●	90	40	1	SCP-2	5.0	CNS1204	BFTX0409N	TRX15(*)	LH040	LH025	C4-CNZ
PSC50 DCMN N 00105-12	●	105	50	1								
PSC63 DCMN N 00140-12	●	140	63	1								

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

N·m Recommended Tightening Torque (N·m)

SumiPolygon

External | D 55° | 93° | Internal Coolant

External Turning
Double Clamp

DDJN
External/Profiling

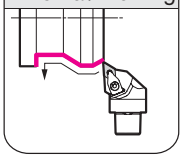


Fig 1

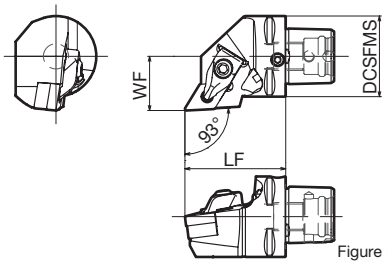


Figure shows right hand (R) tool

Insert

Applicable Insert Cat. No.	Ref. Page
DN□□1504○○	B26 ~

(Representative example)

DNMG150408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Coolant Nozzle
PSC40 DDJN R/L 27050-15*	●	●	27	50	40	1	SCP-2	5.0	DNS1504	BFTX0409N	TRX15(*)	LH040	LH025	C4-CNZ
PSC50 DDJN R/L 35060-15	●	●	35	60	50	1								
PSC63 DDJN R/L 45065-15	●	●	45	65	63	1								
PSC63 DDJN R/L 45130-15	●	●	45	130	63	1								

*Depending on the design, ATC and extension bars may not be usable in some cases. Contact your local sales office prior to use.
*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

External | D 55° | 93° | Internal Coolant

External Turning
Lever Lock

PDJN
External/Profiling

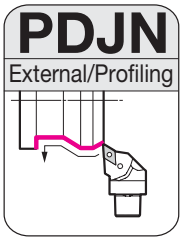


Fig 1

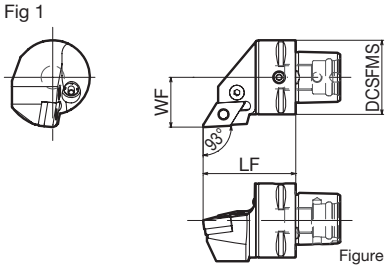


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
DN□□1504○○	B26 ~

(Representative example)

DNMG150408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Lever Pin	Set Screw	Shim	Shim Retainer	Wrench	Coolant Nozzle
PSC40 PDJN R/L 27050-15	●	●	27	50	40	1	LCL4	LCS4	LSD42	LSP4	LH030	C4-CNZ
PSC50 PDJN R/L 35060-15	●	●	35	60	50	1						
PSC63 PDJN R/L 45065-15	●	●	45	65	63	1						

External | D 55° | 63° | Internal Coolant

External Turning
Double Clamp

DDNN
External/Profiling

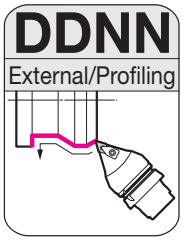
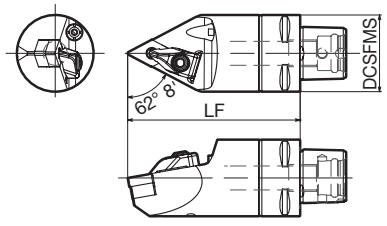


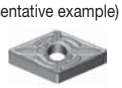
Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
DN□□1504○○	B26 ~

(Representative example)



DNMG150408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Stock N	Overhang LF	Mounting DCSFMS	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Coolant Nozzle
PSC40 DDNN N 00090-15	●	90	40	1	SCP-2	5.0	DNS1504	BFTX0409N	TRX15(*)	LH040	LH025	C4-CNZ
PSC50 DDNN N 00090-15	●	90	50	1								
PSC50 DDNN N 00125-15	●	125	50	1								
PSC63 DDNN N 00100-15	●	100	63	1								
PSC63 DDNN N 00140-15	●	140	63	1								

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

N·m Recommended Tightening Torque (N·m)

SumiPolygon

External | S 90° | 75° | Internal Coolant

External Turning
Double Clamp

DSBN
External Turning

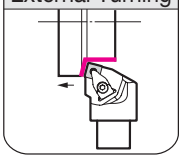


Fig 1

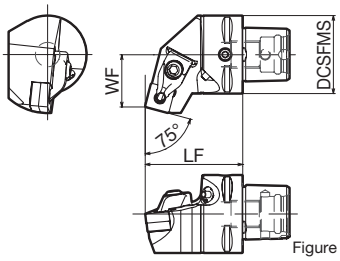


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
SN□□1204○○	B35 ~

(Representative example)

SNMG120404N-GU

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Coolant Nozzle
PSC40 DSBN R/L 27050-12	●	●	27	50	40	1	SCP-2	5.0	SNS1204	BFTX0409N	TRX15(*)	LH040	LH025	C4-CNZ
PSC50 DSBN R/L 35060-12	●	●	35	60	50	1								
PSC63 DSBN R/L 45065-12	●	●	45	65	63	1								

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

External | T 60° | 93° | Internal Coolant

External Turning
Double Clamp

DTJN
External/Profiling

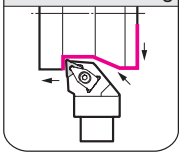


Fig 1

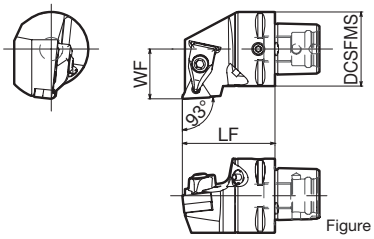


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
TN□□1604○○	B50 ~

(Representative example)

TNMG160404N-GU

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Coolant Nozzle
PSC40 DTJN R/L 27050-16	●	●	27	50	40	1	SCP-1	5.0	TNS1604	BFTX0307N	TRX10(*)	LH040	LH025	C4-CNZ
PSC50 DTJN R/L 35060-16	●	●	35	60	50	1								

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

N·m Recommended Tightening Torque (N·m)

SumiPolygon

External | V 35° | 93° | Internal Coolant

External Turning
Screw-on

SVJC
External/Profiling

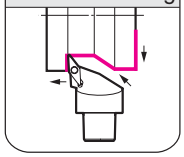


Fig 1

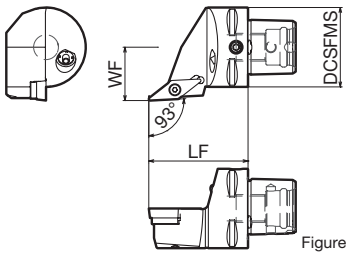


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
VC□□1604○○	B122 ~

(Representative example)

VCMT160404N-SU

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Pin	Nut	Shim	Flat Insert Screw	N·m	Wrench for Shim	Wrench	Coolant Nozzle
PSC40 SVJC R/L 27050-16*	●	●	27	50	40	1	VP20	CPV33N	SVP32	BFTX03508	2.0	LH025	TRX10	C4-CNZ
PSC50 SVJC R/L 35060-16	●	●	35	60	50	1	VP25							
PSC63 SVJC R/L 45065-16	●	●	45	65	63	1								

*Depending on the design, ATC and extension bars may not be usable in some cases. Contact your local sales office prior to use.

External | V 35° | 72.5° | Internal Coolant

External Turning
Screw-on

SVVC
External/Profiling

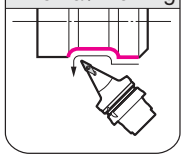
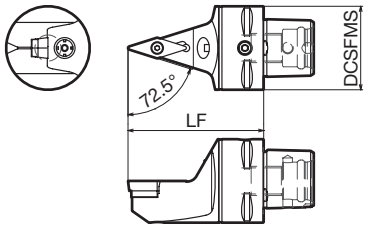


Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
VC□□1604○○	B122 ~

(Representative example)

VCMT160404N-SU

Holder

Parts

Dimensions (mm)

Cat. No.	Stock N	Overhang LF	Mounting DCSFMS	Fig	Pin	Nut	Shim	Flat Insert Screw	N·m	Wrench for Shim	Wrench	Coolant Nozzle
PSC40 SVVC N 00065-16	●	65	40	1	VP20	CPV33N	SVP32	BFTX03508	2.0	LH025	TRX10	C4-CNZ
PSC50 SVVC N 00090-16	●	90	50	1								
PSC50 SVVC N 00125-16	●	125	50	1	VP25							
PSC63 SVVC N 00100-16	●	100	63	1								
PSC63 SVVC N 00140-16	●	140	63	1								

External | W 80° | 95° | 95° | Internal Coolant

External Turning
Double Clamp

DWLN
External Turning and Facing

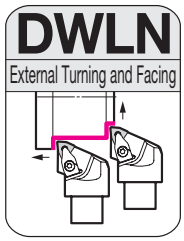


Fig 1

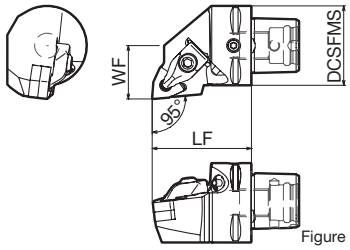


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
WN□□0804○○	B65 ~

(Representative example)

WNMG080404N-GU

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench	Coolant Nozzle
PSC40 DWLN R/L 27050-08	●	●	27	50	40	1	SCP-2	5.0	WNS0804	BFTX0409N	TRX15(*)	LH040	LH025	C4-CNZ

*Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

N·m Recommended Tightening Torque (N·m)

SumiPolygon

Internal | C 80° | 95° | Internal Coolant

Internal Boring
Lever Lock

PCLN
Bottom Facing

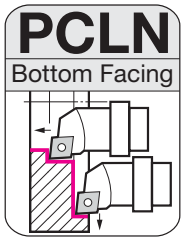


Fig 1

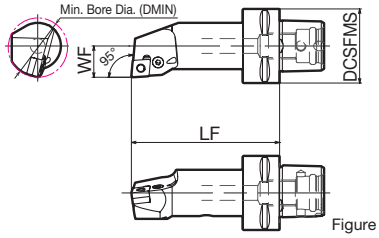


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
CN□□0903○○	B14

(Representative example)

CNMG090308N-GU

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Lever Pin	Set Screw	Shim	Shim Retainer	Wrench
PSC40 PCLN R/L 17080-09	●	●	32	17	80	40	1	LCL3	LCS3	LSC32	LSP3	LH025

Internal | D 55° | 93° | Internal Coolant

Internal Boring
Double Clamp

DDUN
Profiling

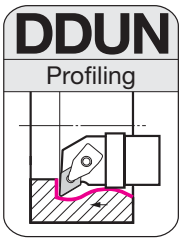


Fig 1

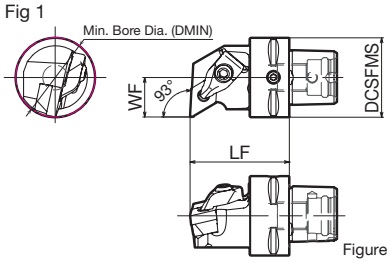


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
DN□□1504○○	B26 ~

(Representative example)

DNMG150408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Clamp Set		Shim	Shim Screw	Wrench for Shim	Top Hex Wrench	Bottom Hex Wrench
									N·m					
PSC40 DDUN R/L 20050-15	●	●	40	20	50	40	1							
PSC40 DDUN R/L 20070-15	●	●	40	20	70	40	1	SCP-2	5.0	DNS1504B	BFTX0409N	TRX15(*)	LH040	LH025
PSC40 DDUN R/L 27090-15	●	●	54	27	90	40	1							

*Wrench for shim is sold separately from the main body.

Clamp Set Parts E82

Internal | D 55° | 93° | Internal Coolant

Internal Boring
Lever Lock

PDUN
Profiling

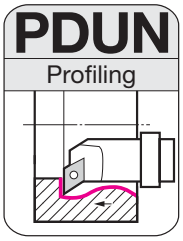


Fig 1

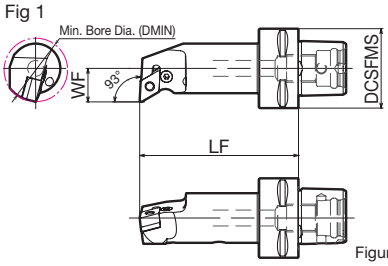


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
DN□□1104○○	B25 ~

(Representative example)

DNMG150408N-GE

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig	Lever Pin	Set Screw	Shim	Shim Retainer	Wrench
PSC40 PDUN R/L 17080-11	●	●	32	17	80	40	1	LCL3	LCS3	LSD317	LSP3	LH025

N·m Recommended Tightening Torque (N·m)

SumiPolygon

Internal | T 60° | 91° | Internal Coolant

Internal Boring
Lever Lock

PTFN
Stop Boring

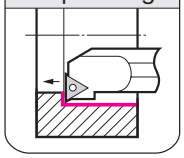


Fig 1

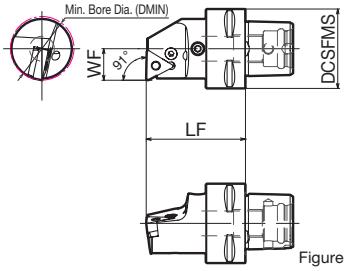


Figure shows right hand (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
TN□□1604○○	B50 ~

(Representative example)

TNMG160404N-GU

Holder

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig
PSC40 PTFN R/L 16050-16	●	●	32	16	50	40	1

Parts

Lever Pin	Set Screw	Shim	Shim Retainer	Wrench
LCL3	LCS3	LST317CA	LSP3	LH025

External | Internal Coolant | External

External Threading
Screw-on

SSTE
External Threading

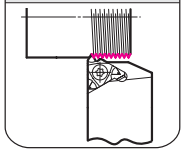
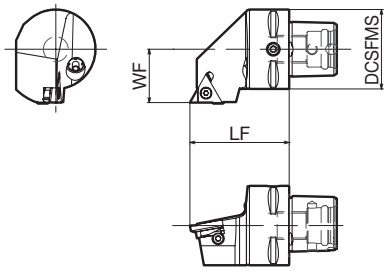


Fig 1



Insert

Applicable Insert Cat. No.	Ref. Page
16ER□□○○CB	F104

(Representative example)

16ERA60-CB

Holder

Dimensions (mm)

Cat. No.	Stock R	Cutting Edge WF	Overhang LF	Mounting DCSFMS	Fig
PSC40 SSTE R 27050-16ER	●	27	50	40	1
PSC50 SSTE R 35060-16ER	●	35	60	50	1
PSC63 SSTE R 45065-16ER	●	45	65	63	1

Parts

Shim	Shim Retainer	Flat Insert Screw	N·m	Wrench for Shim	Wrench	Flat Washer	Coolant Nozzle
YE3	BX0304	BFTX0312N	2.0	LH025(*)	TRX10	PW3	C4-CNZ

*Wrench for shim is sold separately from the main body.

Clamp Set Parts

Applicable Clamp Set Cat. No.	Spring	Stock	Cap Screw	Stock	N·m
SCP-1	CSP08	●	CP-M5-20-1	●	5.0
SCP-2	CSP08	●	CP-M5-20-1	●	

CP-M5-20-1 can also be fastened from the other end of the screw.

SumiPolygon

External | External

SumiPolygon Cassette for External Grooving
Clamp-on

GNDCM
External Grooving

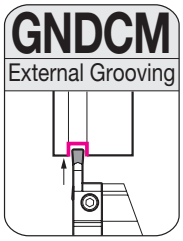


Fig 1

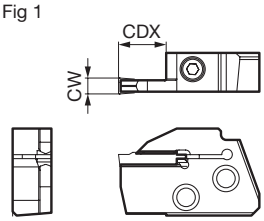


Figure shows right-handed (R) tool.

Insert

Applicable Insert Cat. No.	Ref. Page
GC□□OOOO-□□	F51

(Representative example)

GCMN2002-GG

SumiPolygon GND series Cassette

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Width of Cut CW	Maximum Groove Depth CDX	Applicable Holder	Fig	Cap Screw	N·m	Wrench
GNDCM R/L 212	●	●	2	12	PSCOOGNDOOOO00 R/L	1	BX0512	5.0	LH040
GNDCM R/L 312	●	●	3	12		1			
GNDCM R/L 418	●	●	4	18	PSCOOGNDOOOO90 R/L	1			
GNDCM R/L 518	●	●	5	18		1			
GNDCM R/L 618	●	●	6	18		1			

Select holders and inserts with matching width of cut (CW). Refer to F51 for applicable inserts.
The maximum groove depth CDX is the figure during grooving. For maximum depth of cut during traverse cutting and profiling, refer to F19.

Identification Code Cassette

GNDCM R 2 12

- GNDCM: Series Code
- R: Feed Direction
- 2: Width of Cut (mm)
- 12: Maximum Groove Depth (mm)

Fig 1

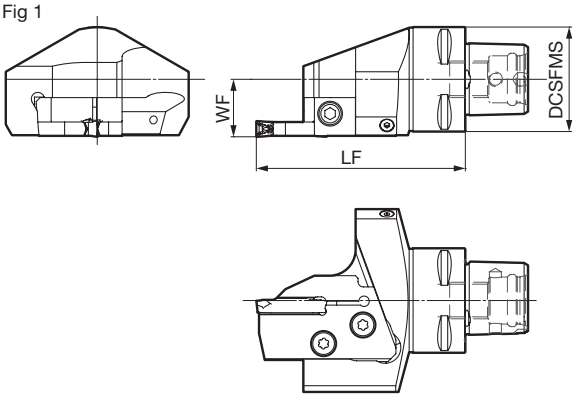


Figure shows right-handed (R) tool.

Fig 1

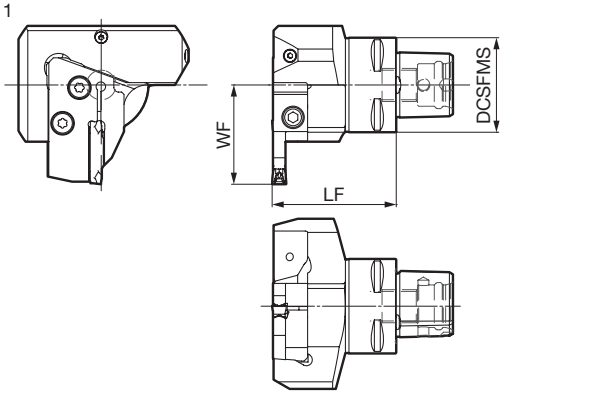


Figure shows right-handed (R) tool.

SumiPolygon GND series Tool Holder (Straight) Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCS-FMS	Applicable Cassettes	Fig	Flat Head Screw	N·m	Wrench
PSC40 GND 228000 R/L	●	●	22	80	40	GNDCM R/LOOO	1	BFTX0619N	7.5	TT25
PSC50 GND 278000 R/L	●	●	27	80	50		1			
PSC63 GND 338000 R/L	●	●	33	80	63		1			

Inserts and cassettes are not included with the holders.

SumiPolygon GND series Tool Holder (L type) Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge WF	Overhang LF	Mounting DCS-FMS	Applicable Cassettes	Fig	Flat Head Screw	N·m	Wrench
PSC40 GND 425290 R/L	●	●	42	52.5	40	GNDCM L/ROOO	1	BFTX0619N	7.5	TT25
PSC50 GND 475590 R/L	●	●	47	55	50		1			
PSC63 GND 545790 R/L	●	●	54	57	63		1			

Inserts and cassettes are not included with the holders.

Identification Code Holder

PSC40 GND 42 52 90 R

- PSC40: SumiPolygon Shank Size
- GND: Series Code: GND series
- 42: WF Dimension (mm)
- 52: LF Dimension (mm)
- 90: 00: Straight 90: L type
- R: Feed Direction

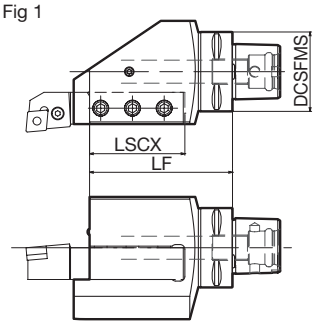
N·m Recommended Tightening Torque (N·m)

SumiPolygon

Square Shank Holder

Adapter

Fig 1



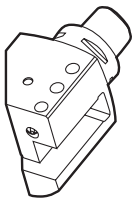


Figure shows right hand (R) tool.

Holder

Parts

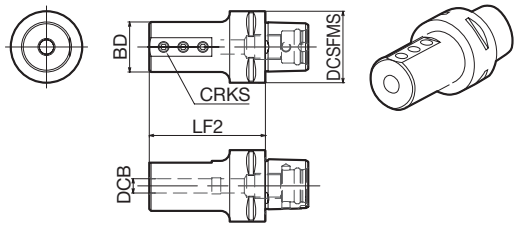
Dimensions (mm)

Cat. No.	Stock R	Stock L	Cutting Edge LSCX	Overhang LF	Mounting DCSFMS	Fig	Set Screw	Wrench	Coolant Nozzle
PSC50 S2020 R/L -90	●	●	60	90	50	1	BTD1012	LH050	C4-CNZ
PSC63 S2525 R/L -100	●	●	70	100	63	1			

Holder for Boring Bar

Adapter

Fig 1



Holder

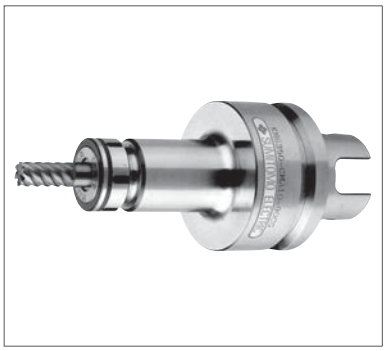
Parts

Dimensions (mm)

Cat. No.	Stock N	Cutting Edge BD	Overhang LF2	Shank Dia. DCB	Screw CRKS	Mounting DCSFMS	Fig	Set Screw	Wrench
PSC40 C08-65	●	28	65	8	M6	40	1	BTD0609	LH030
PSC40 C10-70	●	35	70	10	M8	40	1	BTD0812	LH040
PSC40 C12-70	●	42	70	12	M10	40	1		
PSC40 C16-75	●	48	75	16	M10	40	1		
PSC40 C20-75	●	52	75	20	M10	40	1	BTD1012	LH050
PSC40 C25-83	●	62	83	25	M10	40	1		
PSC40 C32-87	●	62	87	32	M10	40	1		
PSC50 C08-65	●	28	65	8	M6	50	1	BTD0609	LH030
PSC50 C10-70	●	35	70	10	M8	50	1	BTD0812	LH040
PSC50 C12-70	●	42	70	12	M10	50	1		
PSC50 C16-75	●	48	75	16	M10	50	1		
PSC50 C20-75	●	52	75	20	M10	50	1		
PSC50 C25-83	●	62	83	25	M10	50	1		
PSC50 C32-87	●	62	87	32	M10	50	1	BTD1012	LH050
PSC63 C12-70	●	42	70	12	M10	63	1		
PSC63 C16-75	●	48	75	16	M10	63	1		
PSC63 C20-75	●	52	75	20	M10	63	1		

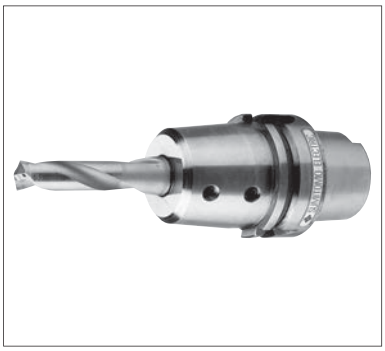
Modular Taper Shank/HSK Tooling System

*Catalogue numbers have been changed due to the establishment of ISO standard ISO 26622-1:2008.



Modular Taper Shank

This has widespread use throughout Europe and the United States.



HSK Tooling System

This hollow shank was developed by RWTH Aachen University and the German Industry Association, and has been adopted as an ISO standard.

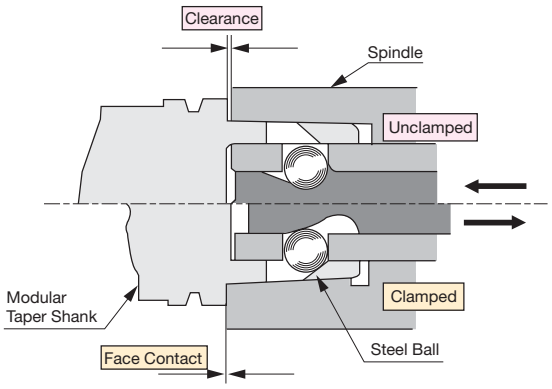
Features

- Tool shape suitable for high-speed rotations.
- Achieving high-precision machining by increasing rigidity at high-speed rotations with two locating faces on the taper and flange, along with an excellent clamping mechanism.
- Hollow and short taper reduces weight and shortens ATC time when changing tools.

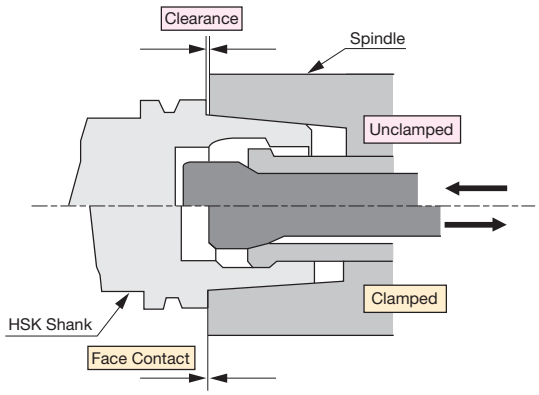
Feature

- DIN standard with 2 locating faces.
- Two locating faces on the taper and flange for high precision and high rigidity machining.
- Hollow and short taper reduces weight and allows for high-speed ATC.

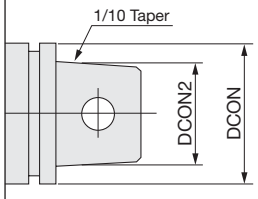
Mechanism



Mechanism

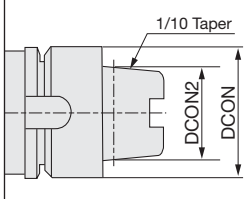


Size



Cat. No.	Mounting Dia. DCON	Mounting Dia. DCON2
TS32	32	24
TS40	40	30
TS50	50	40
TS63	63	50
TS80	80	64

Size



Cat. No.	Mounting Dia. DCON	Mounting Dia. DCON2
HSK A32	32	24
HSK A40	40	30
HSK A50	50	38
HSK A63	63	48
HSK A80	80	60
HSK A100	100	75

MEMO

Smart Damper™

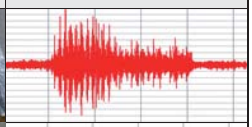
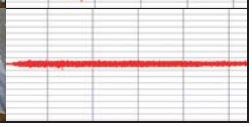
■ Features

Smart Damper™ is arbors equipped with a special anti-vibration mechanism that has both counter damping and friction damping effects.
This suppresses chattering when machining with a large overhang, to prevent reduction of machined surface quality and tool life.

Expanded Internal Boring Lineup Smart Damper™ for Internal Boring E10

- Used in combination with a basic holder and damper head.
- Basic holder lineup supports **BBT50** (**BIG-PLUS™**) Arbor and **HSK-A100** arbors in different lengths.
- Through-centre coolant compatible.

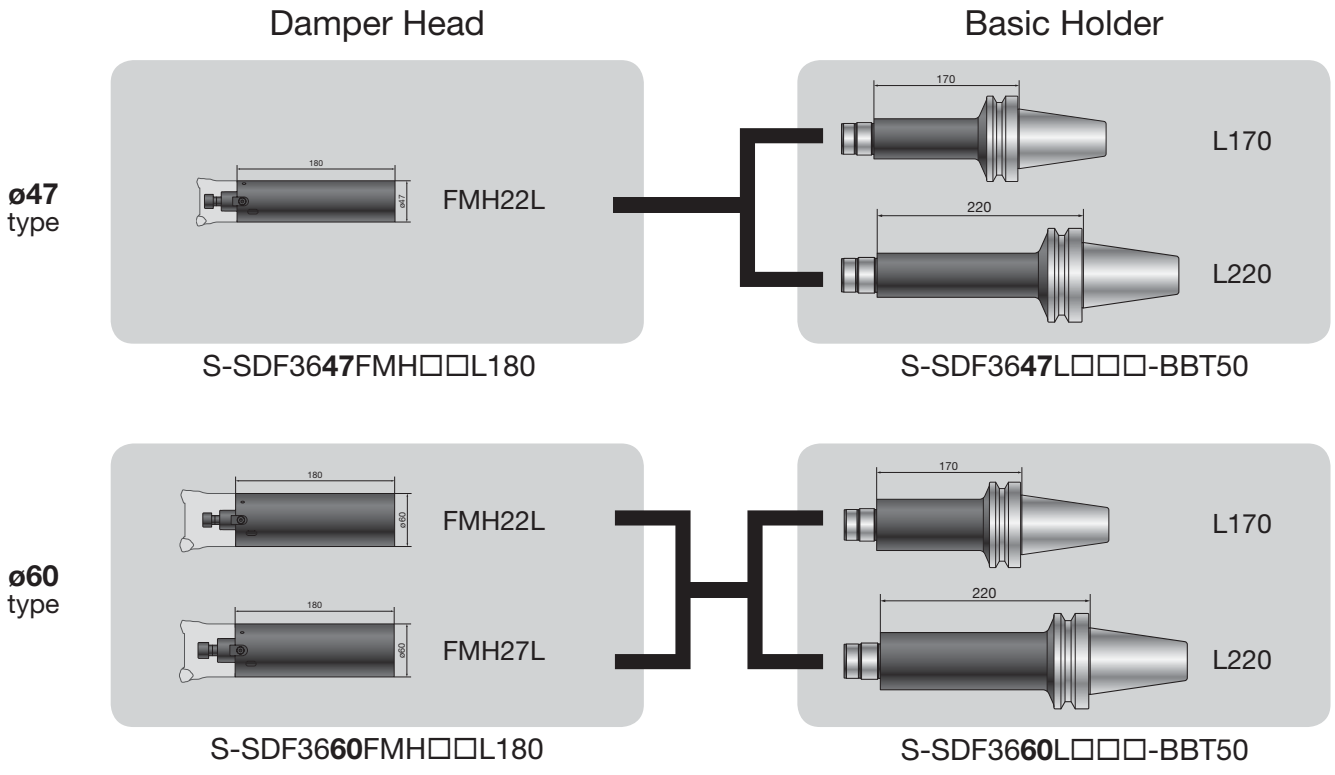
Face Milling Example with 347mm Overhang

Arbor	Results	
	Machined Surface	Vibration
Competitor's Arbor No Anti-Vibration Mechanism		
Smart Damper™ With Anti-Vibration Mechanism		

Suppress chatter by using a Smart Damper™!!

Work Material: S50C
Tool: Tool Diameter ø63 (5-teeth)
Cutting Conditions: vc = 100m/min, fz = 1.0mm/t, ap = 1.4mm, ae = 30mm

■ Smart Damper™ Combination Example (**BBT50** type)

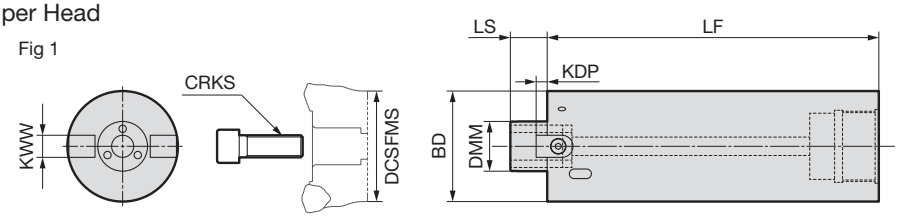


*Smart Damper™ and BIG-PLUS™ are registered trademarks of BIG DAISHOWA Co., Ltd.

Smart Damper™

Damper Head

Fig 1



Damper Head

Dimensions (mm)

Cat. No.	Stock	Connecting Dia. DMM	Body Dia. BD	Overall Length LF	Connection Length LS	Keyway Width KWW	Keyway Depth KDP	Screw CRKS	Weight (kg)	Mounting DCSFMS	Fig
S-SDF3647FMH22L180	●	22	47	180	18	10	5	M10	3.0	36 up	1
S-SDF3660FMH22L180	●	22	60	180	18	10	5	M10	4.5	49 up	1
S-SDF3660FMH27L180	●	27	60	180	20	12	6	M12	4.5	46 up	1

Refer to the user's manual for methods of mounting to basic tool holders.
The cutter is not included in the weight.
A hook wrench and clamp bolt for tightening the cutter are included.
DCSFMS shows the cutter mounting surface diameter. Take care if the mounting surface diameter is small relative to the cutter outer diameter.

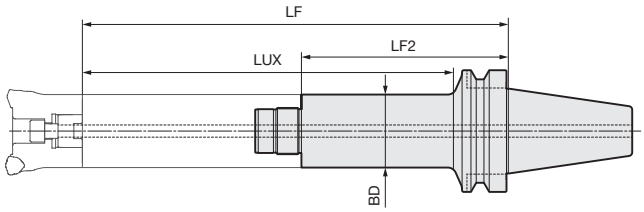
Identification Code

S-SDF36 47 FMH 22 L180

S-SDF36: Connection Method
47: Body Dia.
FMH: Series Code
22: Connecting Dia.
L180: Overall Length

Basic Holder BBT50 type

Fig 1



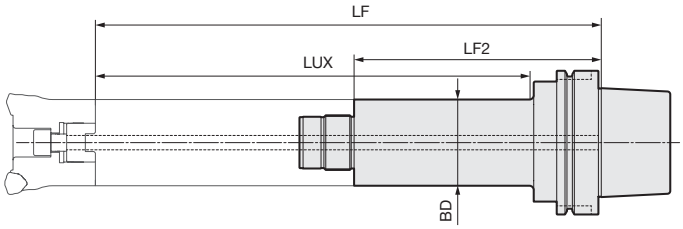
Holder (BBT50)

Dimensions (mm)

Cat. No.	Stock	Body Dia. BD	Overhang LF	Min. Clamping Length LF2	Effective Overhang LUX	Weight (kg)	Applicable Damper Head	Fig
S-SDF3647L170-BBT50	●	47	350	170	297	5.6	S-SDF3647FMH○○L○○○	1
S-SDF3647L220-BBT50	●	47	400	220	347	6.3	S-SDF3647FMH○○L○○○	1
S-SDF3660L170-BBT50	●	60	350	170	297	6.7	S-SDF3660FMH○○L○○○	1
S-SDF3660L220-BBT50	●	60	400	220	347	7.8	S-SDF3660FMH○○L○○○	1

Basic Holder HSK-A100 type

Fig 1



Holder (HSK-A100)

Dimensions (mm)

Cat. No.	Stock	Body Dia. BD	Overhang LF	Min. Clamping Length LF2	Effective Overhang LUX	Weight (kg)	Applicable Damper Head	Fig
S-SDF3647L170-HSKA100	●	47	350	170	310	4.4	S-SDF3647FMH○○L○○○	1
S-SDF3647L220-HSKA100	●	47	400	220	360	5.0	S-SDF3647FMH○○L○○○	1
S-SDF3660L170-HSKA100	●	60	350	170	310	5.5	S-SDF3660FMH○○L○○○	1
S-SDF3660L220-HSKA100	●	60	400	220	360	6.0	S-SDF3660FMH○○L○○○	1

Identification Code

S-SDF36 47 L170 - BBT50

S-SDF36: Connection Method
47: Body Dia.
L170: Min. Clamping Length
BBT50: Shank type

Note: The values in red have been changed from those in the 2021-2022 General Catalogue.

*Smart Damper™ is a registered trademark of BIG DAISHOWA Co., Ltd.

ABS System

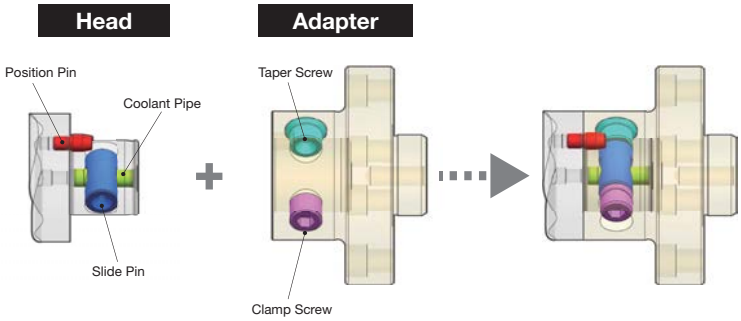
■ Features

The IGETALLOY ABS system has received high acclamation worldwide for its strong clamping force, high rigidity and high precision. ABS is one of the quick change systems for round tools, which increases our customers' productivity in special tooling applications, while simplifying and standardising these special tools.
The SBA system is also available. For details, please contact us.

■ Applications

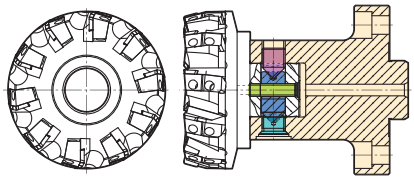
- The clamp screw, taper screw and slide pin act as a wedge for strong holding force.
- High rigidity, high precision. High indexing accuracy during tool changes.
- A wide array of sizes are available to cover a variety of tools.
- Easy handling allows short tool change times.
- Allows coolant supply from inside the spindle.
- Strong clamping force even with small diameters.

■ Clamp Mechanism

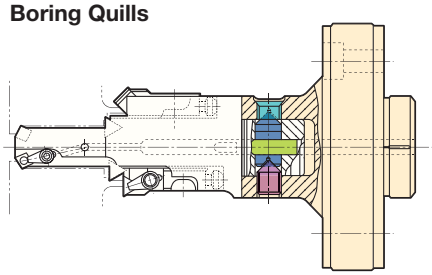


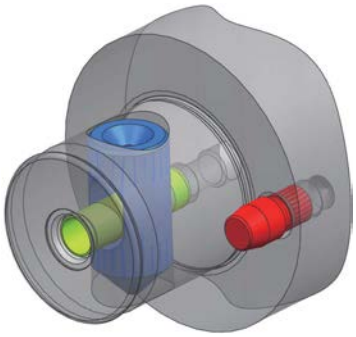
■ ABS System Design Examples

Indexable Cutters



Boring Quills





■ ABS Standard (Head)

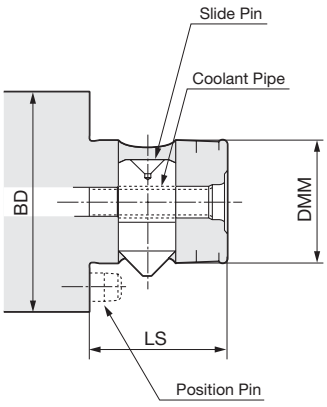
Head Dimensions

Dimensions (mm)

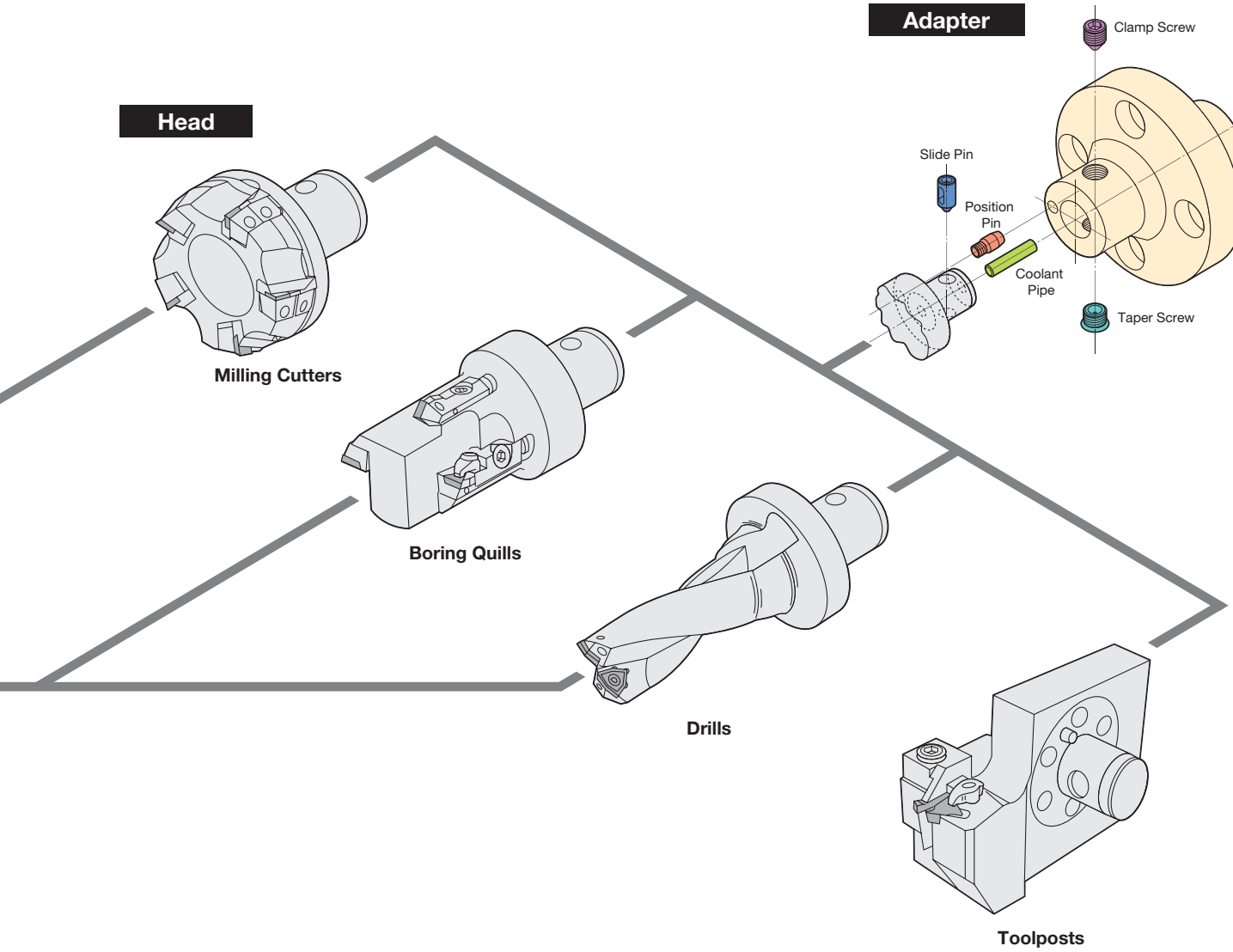
Cat. No.	Body Dia. BD	Shank Dia. DMM	Shank Length LS
ABS 25M	25	13	20
ABS 32M	32	16	23
ABS 40M	40	20	26
ABS 50M	50	28	31
ABS 63M	63	34	38
ABS 80M	80	46	43

Spare Parts

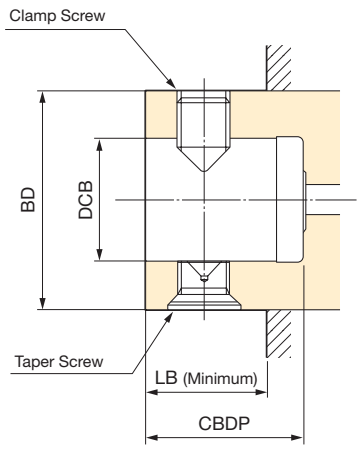
Set Cat. No.	Slide Pin	Position Pin	Coolant Pipe
ABS 25-ES-M3	ABS 25-E3.2	ABS 25-E4	ABS 25-E6
ABS 32-ES-M3	ABS 32-E3.2	ABS 32-E4	ABS 32-E6
ABS 40-ES-M3	ABS 40-E3.2	ABS 40-E4	ABS 40-E6
ABS 50-ES-M3	ABS 50-E3.2	ABS 50-E4	ABS 50-E6
ABS 63-ES-M3	ABS 63-E3.2	ABS 63-E4	ABS 63-E6
ABS 80-ES-M3	ABS 80-E3.2	ABS 80-E4	ABS 80-E6



ABS System



■ ABS Standard (Adapter)



Adapter Dimensions

Dimensions (mm)

Cat. No.	Body Dia. BD	Shank Dia. DCB	Shank Length CBDP	Min. Clamping Length LB
ABS 25W	25	13	22	13.0
ABS 32W	32	16	25	16.0
ABS 40W	40	20	30	18.5
ABS 50W	50	28	34	22.0
ABS 63W	63	34	41	28.0
ABS 80W	80	46	48	34.0
ABS100W	100	56	58	40.5
ABS125W	125	70	76	51.0
ABS160W	160	90	96	53.0
ABS200W	200	112	116	82.0

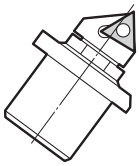
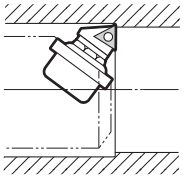
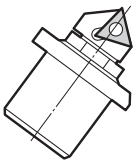
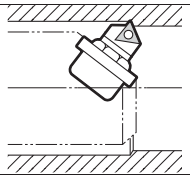
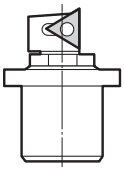
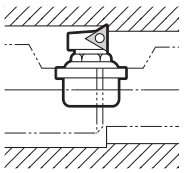
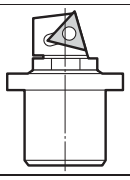
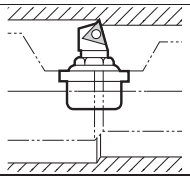
Spare Parts

Set Cat. No.	Clamp Screw	Taper Screw
ABS 25-FS-W	**ABS 25-F1**	**ABS 25-F2**
ABS 32-FS-W	**ABS 32-F1**	**ABS 32-F2**
ABS 40-FS-W	**ABS 40-F1**	**ABS 40-F2**
ABS 50-FS-W	**ABS 50-F1**	**ABS 50-F2**
ABS 63-FS-W	**ABS 63-F1**	**ABS 63-F2**
ABS 80-FS-W	**ABS 80-F1**	**ABS 80-F2**
ABS100-FS-W	**ABS100-F1**	**ABS100-F2**
ABS125-FS-W	**ABS125-F1**	**ABS125-F2**
ABS160-FS-W	**ABS160-F1**	**ABS160-F2**
ABS200-FS-W	**ABS200-F1**	**ABS200-F2**

SEC-Micro Units

This section introduces an overview of the series.
Refer to the separate "SEC-Cartridge Unit/Micro Unit" catalogue for details on Micro Units (holders, inserts, spare parts) and quill unit seat machining.

■ Micro Unit Cat. No. by Model/Tooling type

Illustrations	Tooling	MUP series Cat. No.	Min. Bore Dia. (mm)	Stock	MUN series Cat. No.	Min. Bore Dia. (mm)	Stock
		MUP1-A0	25	●	MUN2 -A0	36	
		MUP2-A0	36	●	MUN3 -A0	47	
		MUP3-A0	47	●	MUN3L-A0	54	
		MUP4-A0	73		MUN4 -A0	73	
					MUN4L-A0	78	
		MUP1-A15	25		MUN2 -A15	36	
		MUP2-A15	36		MUN3 -A15	47	
		MUP3-A15	47		MUN3L-A15	54	
		MUP4-A15	73		MUN4 -A15	73	
					MUN4L-A15	78	
		MUP1-V0	25	●	MUN2 -V0	36	
		MUP2-V0	36	●	MUN3 -V0	47	
		MUP3-V0	47	●	MUN3L-V0	54	
		MUP4-V0	73		MUN4 -V0	73	
					MUN4L-V0	78	
		MUP1-V15	25		MUN2 -V15	36	
		MUP2-V15	36		MUN3 -V15	47	
		MUP3-V15	47		MUN3L-V15	54	
		MUP4-V15	73		MUN4 -V15	73	
					MUN4L-V15	78	

*If a left hand unit is required, include "LH" after the catalogue number. (Ex.: MUP1-A0-LH, MUP1-V0-LH)
*Inserts and wrenches are not included with Micro Units.

SEC-Cartridge Units

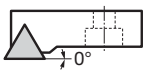
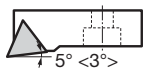
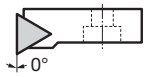
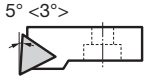
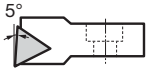
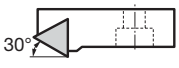
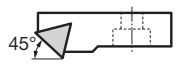
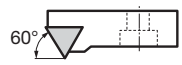
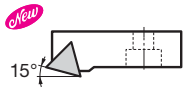
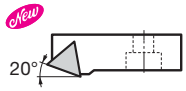
This section introduces an overview of the series.
Refer to the separate "SEC-Cartridge Unit/Micro Unit" catalogue for details on Micro Units (holders, inserts, spare parts) and quill unit seat machining.

■ Features of Each Model

Classification	Standard type	MINIT type		ISO type			
Cat. No.	BU type	MINIT P24 type	MINIT N38 type	SP type/SX type/SC type	CP type	CE type	PN type
Shape / Items	The most common type of cartridge units	Mini type with good edge sharpness and chip control	Compact type for multi-tooling configurations	Screw-on type positive cutting edge with excellent sharpness and chip evacuation	Positive cutting edge type for low-rigidity work	High rake cutting edge type for non-ferrous metal machining	Negative cutting edge type with excellent compatibility and economy
Clamp Mechanism	Pin Lock	Screw-on	Pin Lock	Screw-on	Clamp-on	Clamp-on	Pin Lock
Adjustability	Yes	Axial: No Radial: Yes	No (By using shims)	Yes	Yes	Yes	Yes
Rake Angle	Neg.	Pos.	Neg.	Pos.	Pos.	Pos.	Neg.
Applicable Insert Relief Angle	0°	11°	0°	11° (SP type) 7° (SX type/SC type)	11°	20°	0°
Cutting Edge Position	Above centre	Above centre and on centre	Above centre	On Centre	On Centre	On Centre	On Centre
Min. Bore Dia. (mm)	ø24	ø24	ø38	ø30	ø30	ø30	ø38

■ Cartridge Unit Cat. No. (For Triangular Inserts) by Model/Tooling type

( ) shows the min. bore diameter (mm).

Configuration	BU type	Stock R	Stock L	MINIT P24 type	Stock R	Stock L	MINIT N38 type	Stock R	Stock L	SP type/SX type/SC type	Stock R	Stock L	CP type	Stock R	Stock L	CE type	Stock R	Stock L	PN type	Stock R	Stock L
 0°							MTGN3 R/L(38)	●	●	STGP R/L-10CA(38)	●	●	CTGP R/L10CA(38)	●	●	CTGE R/L10CA(38)			PTGN R/L10CA(38)	●	●
										STGP R/L-12CA(50)	●	●	CTGP R/L12CA(50)	●	●	CTGE R/L12CA(50)			PTGN R/L12CA(50)	●	●
										STGP R/L-16CA(60)	●	●	CTGP R/L16CA(60)	●	●				PTGN R/L16CA(60)	●	●
																			PTGN R/L20CA(70)		●
 5° <3°> <>: MINIT P24	BU224 R/L(48)	●		MTJP22 R/L(24)	●	●	MTJN3 R/L(38)	●		STJP R/L-10CA(38)	●	●	CTJP R/L10CA(38)	●		CTJE R/L10CA(38)	●				
	BU225 R/L(60)	●								STJP R/L-12CA(50)	●	●	CTJP R/L12CA(50)	●		CTJE R/L12CA(50)	●				
										STJP R/L-16CA(55)	●	●	CTJP R/L16CA(55)								
 0°	BU252 R/L(24)	●	●	MTFP22 R/L(24)	●	●	MTFN3 R/L(38)	●	●	STFP R/L- 8CA(30)	●	●	CTFP R/L 8CA(30)	●	●	CTFE R/L 8CA(30)	●	●	PTFN R/L10CA(38)	●	●
	BU253 R/L(30)	●								STFP R/L-10CA(38)	●	●	CTFP R/L10CA(38)	●	●	CTFE R/L10CA(38)	●	●	PTFN R/L12CA(50)	●	●
	BU254 R/L(38)	●								STFP R/L-12CA(50)	●	●	CTFP R/L12CA(50)	●	●	CTFE R/L12CA(50)	●	●	PTFN R/L16CA(55)	●	●
	BU255 R/L(48)	●	●							STFP R/L-16CA(55)	●	●	CTFP R/L16CA(55)	●	●	CTFE R/L16CA(55)	●		PTFN R/L20CA(70)	●	●
	BU256 R/L(55)	●											CTFP R/L20CA(70)	●	●	CTFE R/L20CA(70)	●				
5° <3°>  <>: MINIT P24/N38	BU293 R/L(30)	●		MTUP22 R/L(24)	●	●	MTUN3 R/L(38)	●	●	STUP R/L-10CA(38)	●	●	CTUP R/L10CA(38)	●	●	CTUE R/L10CA(38)	●				
	BU294 R/L(38)	●								STUP R/L-12CA(50)	●	●	CTUP R/L12CA(50)	●		CTUE R/L12CA(50)					
	BU295 R/L(48)	●	●							STUP R/L-16CA(55)	●	●	CTUP R/L16CA(55)	●							
5° 	BU295ER/L(48)		●																		
30° 										STTP R/L- 8CA(30)	●	●	CTTP R/L 8CA(30)	●		CTTE R/L 8CA(30)	●		PTTN R/L10CA(38)	●	
										STTP R/L-10CA(38)	●	●	CTTP R/L10CA(38)	●	●	CTTE R/L10CA(38)	●		PTTN R/L12CA(50)	●	●
										STTP R/L-12CA(50)	●	●	CTTP R/L12CA(50)	●	●	CTTE R/L12CA(50)	●		PTTN R/L16CA(60)	●	
										STTP R/L-16CA(60)	●	●	CTTP R/L16CA(60)	●	▲	CTTE R/L16CA(60)					
45° 										STSP R/L-10CA(38)	●	●	CTSP R/L10CA(38)	●		CTSE R/L 8CA(30)	●				
										STSP R/L-12CA(50)	●	●	CTSP R/L12CA(50)	●		CTSE R/L10CA(38)	●				
										STSP R/L-16CA(55)	●	●	CTSP R/L16CA(55)	●		CTSE R/L12CA(50)	●				
																CTSE R/L16CA(55)					
60° 				MTWP22 R/L(24)	●	●	MTWN3 R/L(38)	●		STWP R/L- 8CA(30)	●	●	CTWP R/L 8CA(30)	●		CTWE R/L 8CA(30)	●				
										STWP R/L-10CA(38)	●	●	CTWP R/L10CA(38)	●	●	CTWE R/L10CA(38)	●				
										STWP R/L-12CA(50)	●	●	CTWP R/L12CA(50)	●	●	CTWE R/L12CA(50)	●				
										STWP R/L-16CA(55)	●	●	CTWP R/L16CA(55)			CTWE R/L16CA(55)					
New 15° 										STRP R/L 8CA(30)	●	●	CTRP R/L 8CA(30)	●		CTRE R/L 8CA(30)	●				
										STRP R/L 10CA(38)	●	●	CTRP R/L 10CA(38)	●	●	CTRE R/L 10CA(38)	●				
New 20° 										STXP R/L 8CA(30)	●	●	CTXP R/L 8CA(30)	●	●	CTXE R/L 8CA(30)	●	●			
										STXP R/L 10CA(38)	●	●	CTXP R/L 10CA(38)	●	●	CTXE R/L 10CA(38)	●	●			

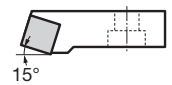
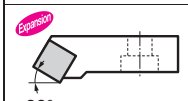
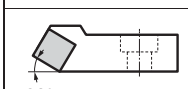
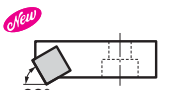
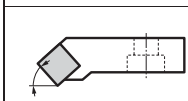
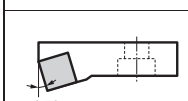
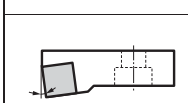
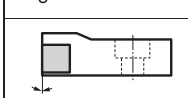
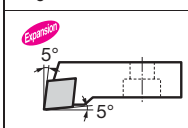
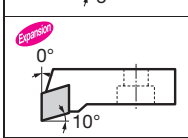
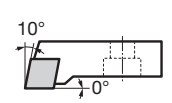
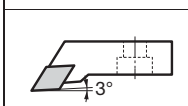
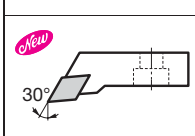
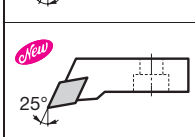
*Inserts and wrenches are not included with Cartridge Units.

● mark: Standard stocked item (new product/expanded item)

SEC-Cartridge Units

■ Tool Holder Cat. No. (For Square Inserts, 80°, 55°, Diamond Inserts)

( ) shows the min. bore diameter (mm).

Configuration	BU type	Stock R	Stock L	MINIT P24 type	Stock R	Stock L	MINIT N38 type	Stock R	Stock L	SP type/SX type/SC type	Stock R	Stock L	CP type	Stock R	Stock L	CE type	Stock R	Stock L	PN type	Stock R	Stock L
 15°	BU113 R/L(30)	●					MSRN4 R/L(38)	●	●	SSRP R/L-10CA(38)	●	●	CSRP R/L10CA(38)	●		CSRE R/L10CA(38)	●				
	BU114 R/L(38)	●											CSRP R/L12CA(50)	●		CSRE R/L12CA(50)	●				
	BU115 R/L(48)	●											CSRP R/L16CA(55)	●							
 30°	BU133 R/L(30)	●		MSTP04 R/L(24)	●	●	MSTN4 R/L(38)	●	●	SSTP R/L 10CA(38)	●	●	CSTP R/L 8CA(30)	●	●	CSTE R/L 8CA(30)	●	●			
	BU134 R/L(38)	●	●										CSTP R/L 10CA(38)	●	●	CSTE R/L 10CA(38)	●	●			
	BU135 R/L(48)	●	●																		
 30°	BU134E R/L(30)		●																		
	BU135E R/L(38)		●																		
 60°										SSWP R/L 10CA(38)	●	●	CSWP R/L 8CA(30)	●	●	CSWE R/L 8CA(30)	●	●			
													CSWP R/L 10CA(38)	●	●	CSWE R/L 10CA(38)	●	●			
 45°	BU142 R/L(24)	●	●	MSSP04 R/L(24)	●	●	MSSN4 R/L(38)	●	●	SSSP R/L- 8CA(30)	●	●	CSSP R/L 8CA(30)	●		CSSE R/L 8CA(30)	●		PSSN R/L10CA(38)	●	●
	BU143 R/L(30)	●								SSSP R/L-10CA(38)	●	●	CSSP R/L10CA(38)	●	●	CSSE R/L10CA(38)	●	●	PSSN R/L12CA(50)	●	●
	BU144 R/L(38)	●	●										CSSP R/L12CA(50)	●	●	CSSE R/L12CA(50)			PSSN R/L16CA(55)	●	●
	BU145 R/L(48)	●	●										CSSP R/L16CA(55)	●		CSSE R/L16CA(55)					
 15°	BU152 R/L(24)	●	●				MSKN4 R/L(38)	●	●	SSKP R/L- 8CA(30)	●	●	CSKP R/L 8CA(30)	●		CSKE R/L 8CA(30)	●	●	PSKN R/L10CA(38)	●	
	BU153 R/L(30)	●	●							SSKP R/L-10CA(38)	●	●	CSKP R/L10CA(38)	●	●	CSKE R/L10CA(38)	●	●	PSKN R/L12CA(50)	●	●
	BU154 R/L(38)	●	●										CSKP R/L12CA(50)	●		CSKE R/L12CA(50)	●		PSKN R/L16CA(55)	●	
	BU155 R/L(48)	●	●										CSKP R/L16CA(55)	●		CSKE R/L16CA(55)	●		PSKN R/L20CA(70)	●	
 5°	BU183 R/L(30)	●		MSYP04 R/L(24)	●	●	MSYN4 R/L(38)	●	●	SSYP R/L- 8CA(30)	●	●	CSYP R/L 8CA(30)	●		CSYE R/L 8CA(30)	●		PSYN R/L10CA(38)	●	
	BU184 R/L(38)	●								SSYP R/L-10CA(38)	●	●	CSYP R/L10CA(38)	●		CSYE R/L10CA(38)	●		PSYN R/L12CA(50)	●	●
	BU185 R/L(48)	●											CSYP R/L12CA(50)	●		CSYE R/L12CA(50)	●		PSYN R/L16CA(55)	●	●
													CSYP R/L16CA(55)			CSYE R/L16CA(55)			PSYN R/L20CA(70)	●	
 0°	BU194 R/L(30)		●																		
	BU195 R/L(38)		●																		
 5° 5°							MCLN4 R/L(38)	●	●	SXLP R 8CA(30)	●	—							PCLN R/L12CA(50)	●	●
										SXLP R 10CA(38)	●	—							PCLN R/L16CA(55)	●	●
										SCLC R/L 10CA(56)	●	●							PCLN R/L20CA(70)	●	●
 0° 10°							MCFN4 R/L(38)	●	●	SXFP R 8CA(30)	●	—									
										SXFP R 10CA(38)	●	—									
										SCFC R/L 10CA(56)	●	●									
 10° 0°							MCGN4 R/L(38)	●	●												
 3°							MDJN4 R/L(38)	●	●												
 30°										SDAC R/L 10CA(56)	●	●									
 25°										SDBC R/L 10CA(56)	●	●									

*Inserts and wrenches are not included with Cartridge Units.

● mark: Standard stocked item (new product/expanded item)

Boring Quills / Carbide Line Boring Bars

This section introduces an overview of the series.
Refer to the separate "SEC-Cartridge Unit/Micro Unit" catalogue for details on Micro Units (holders, inserts, spare parts) and quill unit seat machining.

Indexable Cartridges and Boring Quills

Carbide Line Boring Bar

Carbide Line Bar Equipped with Cartridges

Milling Cutters H

H1 to H251

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Selection Guide for Modular Tools H9
Selection Guide for Modular Tools / Cast Iron High-Feed and Milling Cutters (Special Purpose) ... H10
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XCS2000/ACS2500/ACS3000 ..... H16
Cutter Identification Code H18
Insert Identification Code H19

Face Milling	For General Milling of Steel, Die Steel, Cast Iron, Stainless Steel, Exotic Alloys, and Non-Ferrous Metal	SEC-WaveMill WGX series	H20
	For General Milling of Steel, Die Steel, Cast Iron, Stainless Steel, Exotic Alloys, and Non-Ferrous Metal	SEC-WaveMill WGC series	H26
	For General Milling of Steel, Die Steel, Cast Iron, Stainless Steel, Exotic Alloys, and Non-Ferrous Metal	SEC-Sumi Dual Mill DGC series	H30
	For General Milling of Steel and Exotic Alloy	SEC-SUMI UFO MILL UFO series	H36
	For General Milling of Stainless Steel and Exotic Alloy	SEC-MILL GRC series	H39
	For General Milling of Steel and Exotic Alloy	SEC-ACE MILL FPG series	H40
	For General Milling of Steel and Exotic Alloy	SEC-Multi Use Endmill FPE series	H41
	For General Milling of Steel and Exotic Alloy	SEC-ACE MILL EHG series	H42
	For High-efficiency Cast Iron/Cast Steel Milling	SEC-DNX(F) series / DNH series, DNHS series	H44
	For General Milling of Steel and Cast Iron	SEC-ACE MILL DNF series	H47
	For General Milling of Non-Ferrous Metal	SEC-ACE MILL APG series	H48
	For General Milling of Steel, Cast Iron and Stainless Steel	SEC-ACE MILL DPG series / DPGF series	H49
Shoulder Milling	For High-precision Milling of Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-WaveMill WEZ series	H52
	For High-precision Milling of Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	New SEC-WaveMill WEZR series	H76
	For High-precision Milling of Steel, Die Steel, Cast Iron, Stainless Steel, Exotic Alloys, and Non-Ferrous Metal	SEC-WaveMill WEX series	H86
	For High-efficiency Deep-Step Shoulder Milling	SEC-Wave Repeater WRX series	H96
	For Roughing of Stainless Steel and Exotic Alloy	New SEC-WaveMill WSE series	H102
	For General Milling of Steel, Die Steel, Cast Iron, Stainless Steel, and Non-Ferrous Metal	SEC-WaveMill WFX series	H108
	For General Milling of Steel and Cast Iron	SEC-Sumi Dual Mill DFC series	H117
	For High-efficiency Milling of Steel, Cast Iron and Stainless Steel	SEC-Sumi Dual Mill TSX series	H124
	For High-efficiency Cast Iron/Cast Steel Milling	SEC-Sumi Power Mill PWC(F) series	H152
	For Milling of Steel, Cast Iron and Stainless Steel	SEC-Sumi Power Mill PWS(F) series / PWSR series	H153
	For Milling of Steel, Cast Iron and Stainless Steel	SEC-ACE MILL CHG series	H156
	For Milling of Steel, Cast Iron and Non-Ferrous Metal	SEC-Multi Use Endmill CHE series	H157
	For Milling of Steel, Cast Iron and Stainless Steel	SEC-ACE MILL CPG series	H160
	For Milling of Steel, Cast Iron and Stainless Steel	SEC-Light Endmill FMS series	H161
High-Feed	For High-feed Milling of Steel, Die Steel, Cast Iron, and Stainless Steel	New SEC-Sumi Dual Mill DMSL series / DMSW series	H162
	For High-speed, High-efficiency Milling of Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-WaveMill WFXH series	H174
	For High Feed Milling of Steel, Cast Iron and Stainless Steel	SEC-Metal Slash Mill MSX series	H180
Multi-purpose		SEC-WaveMulti WMM series	H184
Radius	For Milling of Stainless Steel and Exotic Alloy	New SEC-Wave Radius Mill RSE series	H188
	For Milling of Steel, Die Steel, Cast Iron, Stainless Steel and Exotic Alloy	SEC-Wave Radius Mill RSX series	H194
	For Milling of Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-Wave Radius Mill WRCX series	H202
R/3D Profiling	For Roughing	SEC-WaveBall WBMR series	H207
	For Finishing	SEC-WaveBall WBMF series	H210
Side Cutters / T-Slot Cutters	For Groove Milling	New SEC-Sumi Dual Mill TGC series	H212
	For T-Slot Endmilling	SEC-T Slot Cutters TSE series	H218
Chamfering	For Chamfering	SEC-WaveMill WFXC series	H219
	For Chamfering	SEC-Chamfering Cutters SMC series	H222
Non-Ferrous Metals	For High-speed, High-efficiency Milling of Aluminum Alloy and Non-Ferrous Metal	Expansion ALNEX ANX Series	H224
	For High-efficiency Milling of Aluminum Alloy and Non-Ferrous Metal	HF series	H234
	For High-speed Milling of Aluminum Alloy and Non-Ferrous Metal	RF series	H240
	For Small Diameter Milling of Aluminum Alloy and Non-Ferrous Metal	SRF series	H242
	For High-speed, High-efficiency Milling of Non-Ferrous Metal	SEC-WaveMill WAX series	H244
Cast Iron, High-Speed	For High-speed Finishing of Cast Iron	Expansion SUMIBORON BN Finish Mill EASY (FMU/FMU-E series)	H249
	For High-speed Finishing of Cast Iron	Expansion SUMIBORON BN Finish Mill (FM series / FMF series)	H250
	For High-speed, High-efficiency Milling of Cast Iron	Cutter RM series for High-speed Milling of SUMIBORON Cast Iron	H251

H Modular Tools ·····H253

H Special Purpose Cutters ···H275

Stock Markings and Symbols

●● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

Selection Guide for Milling Cutters

◎: Best ○: Suitable ×: Unsuitable Blank: Not Recommended

Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting Edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Cast Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: Hardened Steel
Face Milling	6mm 45°	ø40 to ø250	–	WGX →H22	WGX13000R(S) WGXM13000R(S) WGXF13000R(S)	(4)	20° to 22°	-20° to -24°	◎	◎									◎	◎	◎	◎	◎	◎	◎	
	6mm 45°	ø32 to ø63	ø32	WGX-EW →H25	WGX13000EW	(4)	20° to 22°	-20° to -24°	◎	◎									◎	◎	◎	◎	◎	◎	◎	
	4mm 45°	ø32 to ø100	–	WGC →H26	WGC3000 WGC3000RS	(4)	20°	-10° to -19°	◎	◎									◎	◎	◎	◎	◎	◎	○	
	6mm 45°	ø40 to ø200	–		WGC(F)4000 WGC(F)4000RS		20° to 22°	-20° to -24°																		
	4mm 45°	ø20 to ø63	ø20 to ø32	WGC-EW →H28	WGC3000EW		20°	-10° to -19°	◎	◎									◎	◎	◎	◎	◎	◎	○	
	6mm 45°	ø32 to ø63	ø32		WGC4000EW		20° to 22°	-20° to -24°																		
	6mm 45° 3mm 45°	ø40 to ø250	–	DGC →H32	DGC13000R(S) DGCM13000R(S) DGCF13000R(S)	(8)	-5°	-10°	◎										◎	◎	◎	◎	◎	◎	○	
	6mm 45° 3mm 45°	ø40 to ø63	ø32	DGC-EW →H35	DGC13000EW	(16)	-5°	-10°	◎										◎	◎	◎	◎	◎	◎	○	
	5.5mm 45°	ø80 to ø315	–	UFO →H36	UFO4000	(4)	27°	-7°	○	○									○	○	○	○	○	○		
	7.5mm 45°	ø80 to ø315	–		UFO5000		27°	-7°																		
	5.5mm 45°	ø50 to ø100	ø32 to ø42	UFO-E →H38	UFO4000E	(4)	27°	-7°	○	○									○	○		○	○	○		
	10mm	ø80 to ø250	–	GRC →H39	GRC6000		25°	10°	○											○	○				○	
	6.5mm 45°	ø80 to ø315	–	FPG →H40	FPG4000	(4)	15°	-4°	○										○	○	○	○	○	○		
	8.5mm 45°	ø80 to ø315	–		FPG5000		15°	-4°																		
	6.5mm 45°	ø50 to ø100	ø32 to ø42	FPE →H41	FPE4000	(4)	15°	-3°	○										○	○		○				

*Use a chamfering cutter for chamfering operations. * The number of cutting edges may vary depending on the insert size, etc. Refer to each product page for details.

Smart Damper™ for Milling G20 *Smart Damper™ is a registered trademark of BIG DAISHOWA Co., Ltd.

◎: Best ○: Suitable ×: Unsuitable Blank: Not Recommended

Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting Edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Cast Iron/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: Hardened Steel 45 to 55 HRC
Face Milling	5.5mm 45° *	ø80 to ø200	–	EHG →H42	EHG4000	(4)	20°	-3°	○										○	○	○	○				
	7.5mm 45° *	ø80 to ø200	–		EHG5000		20°	-3°																		
	8mm 65°	ø80 to ø160	–	DNX →H45	DNX12000 DNXF12000	(8)	-5°	-6°	○	○									○			◎				
	3mm 24° 5mm 24°	ø80 to ø160	–	DNH(S) →H46	DNH12000 DNHS12000		-5°	-6°			○								○			◎				
	6.5mm 65°	ø80 to ø500	–	DNF →H47	DNF4000	(4)	-5°	-6°	○	○									○			◎	×	×	×	○
	7mm 65°	ø80 to ø500	–	APG →H48	APG4000	(4)	18°	-2°	○	○									○	○	○	○	◎	◎		×
	9.5mm 75°	ø80 to ø200	–	DPG →H49	DPG4000 DPGF4000	(4)	8°	0°	○	○									○	○	○	○				
	12mm 75°	ø82 to ø502	–		DPG5000		8°	0°																		
Shoulder Milling / Deep Shoulder Milling / Semi-Shoulder Milling	10mm 90°	ø40 to ø100	–	WEZ →H60	WEZ11000R(S)	(2)	14° to 15°	-7° to -11°	◎	◎		◎	◎	◎			○		◎	◎	◎	◎	◎	◎	◎	
	15mm 90°	ø40 to ø160	–		WEZ17000R(S)		10° to 15°	-4° to -9°																		
	10mm 90°	ø14 to ø80	ø10 to ø32	WEZ-E →H64	WEZ11000E WEZ11000ES WEZ11000EL		6° to 15°	-7° to -18°	◎	◎		◎	◎	◎			○		◎	◎	◎	◎	◎	◎	◎	
	15mm 90°	ø25 to ø80	ø16 to ø42		WEZ17000E WEZ17000ES WEZ17000EL		6° to 15°	-6° to -12°																		
	44 to 53mm 90°	ø40 to ø50	–	WEZR New →H78	WEZR11000RS	(2)	14° to 15°	-11° to -9°	○			◎	○						◎	◎	◎	◎	◎	◎	◎	
	29 to 84mm 90°	ø50 to ø80	–		WEZR17000RS		7° to 15°	-8° to -6°																		
	19 to 61mm 90°	ø20 to ø40	ø20 to ø32	WEZR-E New →H82	WEZR11000E		8° to 14°	-15° to -11°																		
	29 to 84mm 90°	ø40 to ø50	ø32 to ø42		WEZR17000E		21° to 12°	-9° to -8°																		
	6mm 90°	ø32 to ø63	–	WEX-F/R →H90	WEX1000F	(2)	9° to 17°	7° to 17°	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎	
	10mm 90°	ø40 to ø63	–		WEX2000F		23° to 25°	16° to 18°																		
	14mm 90°	ø40 to ø125	–		WEX3000F WEX3000R WEXF3000R		19° to 24°	12° to 15°																		
	6mm 90°	ø10 to ø25	ø10 to ø20	WEX-E →H93	WEX1000E WEX1000EL		9° to 17°	7° to 17°																		
	10mm 90°	ø14 to ø63	ø16 to ø32		WEX2000E WEX2000EL		14° to 25°	10° to 18°	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎	
	14mm 90°	ø25 to ø63	ø20 to ø42		WEX3000E(-C) WEX3000ES(-C) WEX3000EL		16° to 24°	8° to 15°																		

*Use a chamfering cutter for chamfering operations. * The number of cutting edges may vary depending on the insert size, etc. Refer to each product page for details.

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Selection Guide for Milling Cutters

◎: Best ○: Suitable ×: Unsuitable Blank: Not Recommended

Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: Hardened Steel
Shoulder Milling / Deep Shoulder Milling / Semi-Shoulder Milling	18 to 36mm 90°	ø40 to ø50	–	WRX-R →H98	**WRX**2000RS	(2)	24°	16° to 17°	○			◎	○	○					◎	◎	◎	◎	◎	◎	◎	
	27 to 53mm 90°	ø50 to ø100	–		**WRX**3000R(S)		22° to 24°	13° to 15°																		
	18 to 36mm 90°	ø20 to ø40	ø20 to ø42	WRX-E →H100	**WRX**2000E	(2)	16° to 24°	13° to 16°	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎	
	27 to 53mm 90°	ø40 to ø50	ø32 to ø42		**WRX**3000E		20° to 22°	12° to 13°																		
	15mm 90°	ø50 to ø63	–	WSE New →H104	**WSE**16000RS	(2)	8° to 14°	-9° to -6°	○			◎	○	◎							◎				◎	
	15mm 90°	ø32	ø32	WSE-E New →H106	**WSE**16000E		8°	-9°																		
	6mm 90°	ø40 to ø100	–	WFX →H110	**WFX**08000R(S) **WFXM**08000R(S) **WFXF**08000R(S)	(4)	12°	-6°	○	◎		◎	○						◎	◎	◎	◎	◎	◎	○	
	10mm 90°	ø50 to ø250	–		**WFX**12000R(S) **WFXF**12000R(S)		8°	-8°																		
	6mm 90°	ø20 to ø63	ø16 to ø32	WFX-E →H115	**WFX**08000E **WFXM**08000E	(4)	12°	-6°	○	◎		◎	○						◎	◎	◎	◎	◎	◎	○	
	10mm 90°	ø40 to ø80	ø32		**WFX**12000E **WFXF**12000E		8°	-8°																		
	6mm 90°	ø50 to ø200	–	DFC →H120	**DFC**09000R(S) **DFCM**09000R(S) **DFCF**09000R(S)	(6)	-5°	-9°	◎	○		◎	○						◎	◎	○	◎			○	
	6mm 90°	ø25 to ø80	ø25 to ø42	DFC-E →H123	**DFC**09000E **DFCM**09000E		-5°	-9°																		
	8mm 90°	ø40 to ø80	–	TSX →H128	**TSX**08000R/L(S) **TSXF**08000R/L(S)	(4)	-6°	-20°	◎	◎		◎	○						◎	◎	◎	◎			◎	
	12mm 90°	ø40 to ø315	–		**TSX**13000R/L(S) **TSXM**13000R/L(S) **TSXF**13000R/L(S)			-23° to -15°																		
	8mm 90°	ø16 to ø80	ø16 to ø32	TSX-E →H136	**TSX**08000E **TSXF**08000E		-6°	-36° to -20°	◎	◎		◎	○						◎	◎	◎	◎			◎	
	12mm 90°	ø25 to ø80	ø25 to ø32		**TSX**13000E **TSXM**13000E **TSXF**13000E			-31° to -15°																		
	34 to 60mm 90°	ø32 to ø63	–	TSXR →H140	**TSXR**08000RS		-6° to -3°	-20° to -15°	○			◎							◎	◎	◎	◎			◎	
	41 to 60mm 90°	ø40 to ø125			**TSXR**13000RS			-23° to -15°																		
	21 to 40mm 90°	ø20 to ø40	ø20 to ø32	TSXR-E →H144	**TSXR**08000E		-6° to -3°	-33° to -18°	○			◎							◎	◎	◎	◎			◎	
	41 to 60mm 90°	ø40 to ø50	ø32 to ø42		**TSXR**13000E			-23° to -18°																		

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Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting Edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: 45 to 65 HRC Hardened Steel
Shoulder Milling / Deep Shoulder Milling / Semi-Shoulder Milling	15mm 88°	ø80 to ø200	–	PWC →H152	**PWC**4000 **PWCF**4000	(4)	-5°	-15°	○			○	○									○					
	16mm 90° / 31mm 90°	ø80 to ø250	–	PWS →H154	**PWS**4000 **PWSF**4000 / **PWSR**4000	(4)	-6°	-15°	○			○	○						○	○	○	○				
	16mm 90°	ø80 to ø315	–	CHG →H156	**CHG**4000	(3)	15°	4°	○			○							○	○	○	○	○	○		
	8mm 90°	ø16 to ø28	ø16 to ø25	CHE →H157	**CHE**2000	(3)	6° to 15°	-3° to 0°	○			○	○						○	○	○	○	○	○		
	13mm 90°	ø30 to ø40	ø32		**CHE**3000		15°	-3° to 0°																		
	16mm 90°	ø50 to ø80	ø32 to ø42		**CHE**4000		15°	2° to 4°																		
	18mm 90°	ø80 to ø315	–	CPG →H160	**CPG**4000	(3)	6°	0°				○	○						○	○	○	○				
	8 to 19mm 90°	ø16 to ø60	ø16 to ø42	FMS →H161	**FMS**	(3)	3° to 7°	-4° to -6°				○	○						○	○	○	○				
High-Feed	1.5mm 17°	ø32.3 to ø55.3	–	DMSL New →H166	**DMSL**06000R(S)	(4)	-8°	-8° to -12.5°			◎	○	○	○					◎	◎	○	◎			○	○
	3mm 15°	ø50 to ø160	–	DMSW →H168	**DMSW**08000R(S)	(6)	-6°	-7° to -10°			◎	○	○	○					◎	◎	○	◎			○	○
	1.5mm 17°	ø8.4 to ø32.3	ø16 to ø32	DMSL-E New →H170	**DMSL**06000E(L)	(4)	-8°	-12.5° to -16.5°			◎	○	○	○					◎	◎	○	◎			○	○
	3mm 15°	ø35 to ø63	ø32 to ø42	DMSW-E →H172	**DMSW**08000E(L)	(6)	-6°	-10° to -13°			◎	○	○	○					◎	◎	○	◎			○	○
	1.5mm 15°	ø40 to ø63	–	WFXH →H177	**WFXH**08000RS	(4)	-6°	6°			◎	○	○	○					◎	◎	◎	◎			○	○
	2.5mm 15°	ø50 to ø63	–		**WFXH**12000RS		-6°	6°																		

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Selection Guide for Milling Cutters

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Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting Edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: 45 to 55 HRC Hardened Steel
High-Feed	1.5 to 2.5mm, 20°	ø40 to ø100	–	MSX →H182	**MSX**08000RS **MSX**12000RS **MSX**14000R(S)	(3)	8°	-3° to -8°			◎	○	○	○					◎	◎	◎	◎				○
	1.0 to 2.5mm, 20°	ø16 to ø63	ø16 to ø42	MSX-E →H183	**MSX**06000E **MSX**08000E **MSX**12000E **MSX**14000E		8°	-3° to -8°			◎	○	○	○					◎	◎	◎	◎				○
Multi-purpose	17 to 35mm, 90°	ø20 to ø30	ø20 to ø25	WMM →H185	**WMM**2000E/EL **WMM**2000ELH /EXLH	(2)	7° to 11°	15° to 16°	◎			◎	◎	◎		◎			◎	◎	◎	◎	◎	◎		
	39mm, 90°	ø32 to ø40	ø32		**WMM**3000E/EL **WMM**3000ELH /EXLH		7° to 11°	17° to 19°																		
Radius	5mm, 4-cornered / 1.4mm, 8-cornered	ø40 to ø50	–	RSE New →H190	**RSE**10000RS	(4)	4°	-5°	○		○			○			○				◎				◎	
	6mm, 4-cornered / 1.7mm, 8-cornered	ø40 to ø80			**RSE**12000R(S)		4°	-5°	○		○			○			○				◎				◎	
	5mm, 4-cornered / 1.4mm, 8-cornered	ø25 to ø32	ø25 to ø32	RSE-E New →H192	**RSE**10000E	(4) (8)	4°	0°	○		○			○			○				◎				◎	
	5mm	ø40 to ø52	–	RSX →H197	**RSX**10000 **RSXF**10000	(4) (8)	10°	-5°	○		○	○	○	◎			◎		◎	◎	◎	◎			◎	
	6mm, 4-cornered / 1.6mm, 8-cornered	ø40 to ø100			**RSX**12000 **RSXF**12000		10°	-5°																		
	8mm, 4-cornered / 2.2mm, 8-cornered	ø63 to ø160			**RSX**16000 **RSXF**16000		10°	-5°																		
	10mm, 4-cornered / 2.7mm, 8-cornered	ø80 to ø160			**RSX**20000 **RSXF**20000		10°	-5°																		
	4mm	ø20 to ø25	ø20 to ø25	RSX-ES →H201	**RSX**08000ES **RSXF**08000ES	(4) (8)	10°	-8°	○		○	○	○	◎			◎		◎	◎	◎	◎			◎	
	5mm	ø25 to ø32	ø25 to ø32		**RSX**10000ES **RSXF**10000ES		10°	-5°																		
	6mm, 4-cornered / 1.6mm, 8-cornered	ø32	ø32		**RSX**12000ES **RSXF**12000ES		10°	-5°																		

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Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting Edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: 45 to 55 HRC Hardened Steel
Radius	6mm	ø40 to ø80	–	WRCX	**WRCX**12000 **WRCXF**12000	(4) (8)	-3°	0°	○		○	○	○	◎			◎		◎	◎	◎	◎	◎	◎		
	8mm	ø63 to ø100	–		**WRCX**16000 **WRCXF**16000		-3°	0°																		
	10mm	ø125 to ø160	–	→H203	**WRCX**20000		-3°	0°																		
	4mm	ø20 to ø25	ø20 to ø25	WRCX-E	**WRCX**08000E	(4) (8)	-3°	-3° to 0°	○		○	○	○	◎			◎		◎	◎	◎	◎	◎	◎		
	5mm	ø25 to ø32	ø25 to ø32		**WRCX**10000E		-3°	0°																		
	8mm	ø40 to ø50	ø32	→H206	**WRCX**16000E		-3°	0°																		
R/3D Profiling	20 to 47mm	R10 (ø20) to R25 (ø50)	ø25 to ø50.8	WBMR	**WBMR**2000	(2)	-10°	—					◎				◎		◎	◎	◎	◎				
	30 to 69mm			→H208	**WBMR**2000L																					
	0.1 to 0.4mm	R5 (ø10) to R15 (ø30)	ø16 to ø32	WBMF →H211	**WBMF**1000	(1)	0°	—					◎				◎	◎	◎	◎						
Side Cutters / T-Slot Cutters	17 to 24.6mm 90°	ø100 to ø200	–	TGC Standard Disc Shape →H215	**TGC**13000	(4)	10°	-11.5° to -9.5	○			○	◎						◎	◎	○	◎				
	9 to 22mm 90°	ø21 to ø50	ø25 to ø32	TSE →H218	**TSE**	(2)	0°	0°					○						○	○		○				
Chamfering	45°	ø8 to ø16	ø10 to ø16	WFXC-E	**WFXC**08000E	(4)	0°	0°							◎				◎	◎	◎	◎	◎	◎	○	
	45°	ø25 to ø32	ø25 to ø32	→H220	**WFXC**12000E																					
	45°	ø7 to ø35	ø32	SMC →H222	**SMC**	(4)	0°	0°							◎				○	○		○				
Non-Ferrous Metals	3mm 90°	ø80 to ø160	–	ANX	**ANXA**16000R(S)	(1)	5°	5°	○	◎	◎	◎	○						×	×	×	×	◎	◎		×
		ø40 to ø125			**ANXS**16000R(S)		5°	5°																		
		ø25 to ø50	ø20 to ø32	→H228	**ANXS**16000E		5°	-2° to 0°																		
	3mm 90°	ø25 to ø50	ø20 to ø32	ANX-E →H232	**ANXS**16000E	(1)	5°	-2° to -0°	○	◎	◎	◎	○						×	×	×	×	◎	◎		×

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Selection Guide for Milling Cutters

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Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting Edges)	Rake Angle: Axial	Rake Angle: Radial	Application: Face Milling: General-purpose	Face Milling: Finishing	Face Milling: High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material: P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: Hardened Steel
Non-Ferrous Metals	3mm 90°	ø80 to ø125	–	HF →H236	HFM12000RS/R HFF12000RS/R HFFH12000RS/R HFFH12000R-BBT30	(1)	10°	4°	◎	◎									×	×	×	×	○	◎		×
3mm 90° (SUMIDIA Insert) 10mm 87° (Carbide Insert)	ø80 to ø200	–	RF →H241	RF4000	(1)	10°	4°	◎	◎									×	×	×	×	○	◎		×
5mm 90°	ø30 to ø63	–	SRF →H243	SRF	(1)	6°	-2° to 4°	◎	◎		○							×	×	×	×	○	◎		×
		ø20		SRF-ST																					
16to18mm 90°	ø50 to ø125	–	WAX →H245	WAX3000	(2)	19° to 25°	6°	○			◎	◎	◎			◎		×	×	×	×	○	◎		×
22to24mm 90°		–		WAX4000																					
16to18mm 90°	ø20 to ø40	ø20 to ø32	WAX-E →H246	WAX3000E WAX3000EL		19° to 25°	6°	○			◎	◎	◎			◎		×	×	×	×	○	◎		×
22to24mm 90°	ø25 to ø40	ø25 to ø32		WAX4000E WAX4000EL																					
5.8mm 65°	ø80 to ø200	–	FAM →M56	FAM	(1)	13°	4°	○	○									×	×	×	×	○	○		×
5.7mm 90°	ø80 to ø100	–	SAM →M56	SAM	(1)	10°	6°	○	○		○							×	×	×	×	○	○		×
5.7mm 90°	ø50 to ø80	ø32	SAM-E →M57	SAM-E	(1)	10°	0° to 2°	○	○		○							×	×	×	×	○	○		×
Cast Iron, High-Speed	0.5mm 45°	ø37 to ø315	–	FMU (Expansion) →H249, L143	FMU FMU-E	(1)	8°	2°		◎									×	×	×	◎ (FC)	×	×	×	×
0.5mm 45°	ø80 to ø160	–	FM (Expansion) →H250, L144	FM FMF	(1)	8°	2°		◎									×	×	×	◎ (FC)	×	×	×	×
3mm 75°	ø80 to ø160	–	RM →H251, L145	RM	(4)	-5° 45'	-6° 45'	○	◎									×	×	×	◎ (FC)	×	×	×	×

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Selection Guide for Modular Tools

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Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: 45 to 55 HRC Hardened Steel
Shoulder Milling / Deep Shoulder Milling	10mm 90°	ø16 to ø40	ø15 to ø32	WEZ-M Modular	**WEZ**11000M	(2)	6° to 15°	-7° to -18°	◎	◎		◎	◎	◎					◎	◎	◎	◎	◎	◎	◎	
	15mm 90°	ø25 to ø40	ø23 to ø32	→H256	**WEZ**17000M		6° to 15°	-6° to -12°																		
	27mm 90°	ø32	–	WEZR-M Modular New	**WEZR**11000M	(2)	11°	-12°	○			◎	○						◎	◎	◎	◎	◎	◎	◎	
	29mm 90°	ø40	–	→H260	**WEZR**17000M		10°	-9°																		
	10mm 90°	ø16 to ø40	ø15 to ø32	WEX-M Modular	**WEX**2000M	(2)	14° to 25°	10° to 18°	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎	
	14mm 90°	ø25 to ø40	ø23 to ø32	→H264	**WEX**3000M		16° to 24°	8° to 15°																		
	6mm 90°	ø20 to ø40	ø18 to ø32	WFX-M Modular	**WFX**08000M	(4)	12°	-6°	○	◎		◎	○						◎	◎	◎	◎	◎	◎	○	
				→H266																						
High-Feed	1.5mm 17°	ø8.4 to ø34.3	–	DMSL-M Modular New	**DMSL**06000M	(4)	-8°	-12.5° to -16.5°			◎	○	○	○					◎	◎	○	◎			○	○
				→H267																						
	3mm 15°	ø35 to ø42	–	DMSW-M Modular	**DMSW**08000M	(6)	-6°	-11° to -13°			◎	○	○	○					◎	◎	○	◎				○
				→H268																						
	1.5mm 15°	ø25 to ø32	ø23 to ø32	WFXH-M Modular	**WFXH**08000M	(4)	6°	-6°			◎	○	○	○					◎	◎	◎	◎			○	○
	2.5mm 15°	ø40	ø28 to ø32	→H269	**WFXH**12000M		6°	-6°																		
	1.0mm 20°	ø16 to ø24.7	ø15 to ø25	MSX-M Modular	**MSX**06000M	(3)	8°	-3° to -6°																		
	1.5mm 20°	ø25 to ø35	ø23 to ø32		**MSX**08000M						◎	○	○	○					◎	◎	◎	◎				○
	2.0mm 20°	ø32 to ø40	ø28 to ø32	→H270	**MSX**12000M																					
Radius	4mm	ø20 to ø32	ø18 to ø32	RSX-M Modular	**RSX**08000M	(4) (8)	10°	-8°	○		○	○	○	◎			◎		◎	◎	◎	◎			◎	
	5mm	ø25 to ø32	ø23 to ø32		**RSX**10000M **RSXF**10000M		10°	-5°																		
	6mm	ø32 to ø40	ø28 to ø32	→H271	**RSX**12000M **RSXF**12000M		10°	-5°																		

Shank diameters listed are sizes of corresponding arbors. Refer to page H255 for details.

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Selection Guide for Modular Tools / Cast Iron High-Feed and Milling Cutters (Special Purpose)

◎: Best ○: Suitable ×: Unsuitable Blank: Not Recommended

Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting Edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: 45 to 55 HRC Hardened Steel
Milling Cutters (Special Purpose)																										
Radius	1.6mm 8-cornered	ø20 to ø25	ø18 to ø25	WRCX-M Modular →H272	WRCX08000M	(4) (8)	-3°	-3° to 0°	○		○	○	○	◎			◎		◎	◎	◎	◎	◎	◎		
	4mm 4-cornered																									
	5mm	ø25 to ø32	ø23 to ø32		WRCX10000M			0°																		
	6mm	ø40	ø28 to ø32		WRCX12000M																					
Chamfering	45°	ø16	ø15 to ø16	WFXC-M Modular →H273	WFXC08000M	(4)	0°	0°							◎				◎	◎	◎	◎	◎	◎	○	
		ø25 to ø32	ø23 to ø32		WFXC12000M		0°	0°																		
Non-Ferrous Metals	3mm 90°	ø25 to ø40	ø25 to ø32	ANXS-M Modular →H274	ANXS16000M	(1)	5°	-2° to 0°	○	◎	◎	◎	○						×	×	×	×	◎	◎		×
High Feed Cast Iron Machining	1mm 89°~89°30'	ø63 to ø315	–	GFX →H278	GFX(C)13000	(4)	-5°	-8°		◎	◎								×	×	×	◎	×	×	×	×
					GFX16000																					
	6mm 60°	ø80 to ø315	–	GRHN →H280	GRHNF17000	(6)	-6°	-6° 30' to -5°			◎								×	×	×	◎	×	×	×	×
					GRHNM17000		-6°	-6° 30' to -5°																		
	5.5mm 45° *	ø100 to ø450	–	NRV →H284	NRV4000	(4)	-5°	-6°			◎								×	×	×	◎	×	×	×	×
	8.5mm 45° *		–		NRV5000																					
	7mm 65°	ø100 to ø450	–	DPV →H285	DPV4000	(4)	10°	5°		○	◎								×	×	×	◎	×	×	×	×
	7.5mm 65°	ø100 to ø450	–		DPV5000		10°	5°																		
	0.5mm 90°	ø100 to ø450	–	NFV →H286	NFV4000	(4)	-5°	-6°		◎	◎								×	×	×	◎	×	×	×	×
	0.5mm 90°	ø100 to ø450	–		NFV5000		-5°	-6°		◎	◎								×	×	×	◎	×	×	×	×
	10mm 65°	ø200 to ø450	–	APV →H287	APV5000	(4)	18°	-2°		◎	◎								○	○	×	○	◎	○		×

*Use a chamfering cutter for chamfering operations. * The number of cutting edges may vary depending on the insert size, etc. Refer to each product page for details.

Smart Damper™ for Milling G20 *Smart Damper™ is a registered trademark of BIG DAISHOWA Co., Ltd.

Selection Guide for Milling Cutters (Shank type)

◎: Best ○: Suitable ×: Unsuitable Blank: Not Recommended

Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series	Model	Insert Shape Example	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: Hardened Steel
Face Milling	6mm 45° *	ø32 to ø63	ø32	WGX-EW →H25	**WGX**13000EW	(4)	20° to 22°	-20° to -24°	◎	◎									◎	◎	◎	◎	◎	◎	◎	
	4mm 45° *	ø20 to ø63	ø20 to ø32	WGC-EW →H28	**WGC**3000EW	(4)	20°	-10° to -19°	◎	◎									◎	◎	◎	◎	◎	◎	○	
	6mm 45° *	ø32 to ø63	ø32		**WGC**4000EW		20° to 22°	-20° to -24°																		
	6mm 45° * 3mm 45° *	ø40 to ø63	ø32	DGC-EW →H35	**DGC**13000EW	(4)	-5°	-10°	◎										◎	◎	◎	◎	◎	◎	○	
	5.5mm 45° *	ø50 to ø100	ø32 to ø42	UFO-E →H38	**UFO**4000E	(4)	27°	-7°	○	○									○	○		○	○	○		
	6.5mm 45° *	ø50 to ø100	ø32 to ø42	FPE →H41	**FPE**4000	(4)	15°	-3°	○										○	○		○				
Shoulder Milling / Deep Shoulder Milling	10mm 90°	ø14 to ø80	ø10 to ø32	WEZ-E →H64	**WEZ**11000E **WEZ**11000ES **WEZ**11000EL	(2)	6° to 15°	-7° to -18°	◎	◎		◎	◎	◎					◎	◎	◎	◎	◎	◎	◎	
	15mm 90°	ø25 to ø80	ø16 to ø42		**WEZ**17000E **WEZ**17000ES **WEZ**17000EL		6° to 15°	-6° to -12°																		
	19 to 61mm 90°	ø20 to ø40	ø20 to ø32	WEZR-E New →H82	**WEZR**11000E	(2)	8° to 14°	-15° to -11°	○			◎	○						◎	◎	◎	◎	◎	◎	◎	
	29 to 84mm 90°	ø40 to ø50	ø32 to ø42		**WEZR**17000E		10° to 12°	-9° to -8°																		
	6mm 90°	ø10 to ø25	ø10 to ø20	WEX-E →H93	**WEX**1000E **WEX**1000EL	(2)	9° to 17°	7° to 17°	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎	
	10mm 90°	ø14 to ø63	ø16 to ø32		**WEX**2000E **WEX**2000EL		14° to 25°	10° to 18°																		
	14mm 90°	ø25 to ø63	ø20 to ø42		**WEX**3000E(-C) **WEX**3000ES(-C) **WEX**3000EL		16° to 24°	8° to 15°																		
	18 to 36mm 90°	ø20 to ø40	ø20 to ø42	WRX-E →H100	**WRX**2000E	(2)	16° to 24°	13° to 16°	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎	
	27 to 53mm 90°	ø40 to ø50	ø32 to ø42		**WRX**3000E		20° to 22°	12° to 13°																		
	15mm 90°	ø32	ø32	WSE-E New →H106	**WSE**16000E	(2)	8°	-9°	○			◎	○	◎							◎				◎	
	6mm 90°	ø20 to ø63	ø16 to ø32	WFX-E →H115	**WFX**08000E **WFXM**08000E	(4)	12°	-6°	○	◎		◎	○						◎	◎	◎	◎	◎	◎	◎	
	10mm 90°	ø40 to ø80	ø32		**WFX**12000E **WFXF**12000E		8°	-8°																		
	6mm 90°	ø25 to ø80	ø25 to ø42	DFC-E →H123	**DFC**09000E **DFCM**09000E	(6)	-5°	-9°	◎	○		◎	○						◎	◎	○	◎			○	

*Use a chamfering cutter for chamfering operations. * The number of cutting edges may vary depending on the insert size, etc. Refer to each product page for details.

Selection Guide for Milling Cutters (Shank type)

◎: Best ○: Suitable ×: Unsuitable Blank: Not Recommended

Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: 45 to 65 HRC Hardened Steel
Shoulder Milling / Deep Shoulder Milling	8mm 90°	ø16 to ø80	ø16 to ø32	TSX-E →H136	TSX08000E TSXF08000E	(4)	-6°	-36° to -20°	◎	◎		◎	○						◎	◎	◎	◎			◎	
	12mm 90°	ø25 to ø80	ø25 to ø32		TSX13000E TSXM13000E TSXF13000E			-31° to -15°																		
	21 to 40mm 90°	ø20 to ø40	ø20 to ø32	TSXR-E →H144	TSXR08000E	(4)	-6° to -3°	-33° to -18°	○			◎							◎	◎	◎	◎			◎	
	41 to 60mm 90°	ø40 to ø50	ø32 to ø42		TSXR13000E			-23° to -18°																		
	8mm 90°	ø16 to ø28	ø16 to ø25	CHE →H157	CHE2000	(3)	6° to 15°	-3° to 0°				○	○						○	○	○	○	○	○		
	13mm 90°	ø30 to ø40	ø32		CHE3000		15°	-3° to 0°																		
	16mm 90°	ø50 to ø80	ø32 to ø42		CHE4000		15°	2° to 4°																		
	8 to 19mm 90°	ø16 to ø60	ø16 to ø42	FMS →H161	FMS	(3)	3° to 7°	-4° to -6°	○			○	○						○	○	○	○				
High-Feed	1.5mm 17°	ø8.4 to ø32.3	ø16 to ø32	DMSL-E New →H170	DMSL06000E(L)	(4)	-8°	-12.5° to -16.5°			◎	○	○	○					◎	◎	○	◎			○	○
	3mm 15°	ø35 to ø63	ø32 to ø42	DMSW-E →H172	DMSW08000E(L)	(6)	-6°	-10° to -13°			◎	○	○	○					◎	◎	○	◎				○
	1.0 to 2.5mm 20°	ø16 to ø63	ø16 to ø42	MSX-E →H183	MSX06000E MSX08000E MSX12000E MSX14000E	(3)	8°	-3° to -8°			◎	○	○	○					◎	◎	◎	◎				○
Multi-purpose	17 to 35mm 90°	ø20 to ø30	ø20 to ø25	WMM →H185	WMM2000E/EL WMM2000ELH /EXLH	(2)	7° to 11°	15° to 16°	◎			◎	◎	◎		◎	◎		◎	◎	◎	◎	◎	◎		
	39mm 90°	ø32 to ø40	ø32		WMM3000E/EL WMM3000ELH /EXLH		7° to 11°	17° to 19°																		
Radius	5mm 4-cornered 1.4mm 8-cornered	ø25 to ø32	ø25 to ø32	RSE-E New →H192	RSE10000E	(4) (8)	4°	0°	○		○			○			○				◎				◎	
	4mm	ø20 to ø25	ø20 to ø25	RSX-ES →H201	RSX08000ES RSXF08000ES	(4) (8)	10°	-8°	○		○	○	○	◎			◎		◎	◎	◎	◎			◎	
	5mm	ø25 to ø32	ø25 to ø32		RSX10000ES RSXF10000ES		10°	-5°																		
	6mm	ø32	ø32		RSX12000ES RSXF12000ES		10°	-5°																		
	4mm	ø20 to ø25	ø20 to ø25	WRCX-E →H206	WRCX08000E	(4) (8)	-3°	-3° to 0°	○		○	○	○	◎			◎		◎	◎	◎	◎	◎	◎		
	5mm	ø25 to ø32	ø25 to ø32		WRCX10000E		-3°	0°																		
	8mm	ø40 to ø50	ø32		WRCX16000E		-3°	0°																		

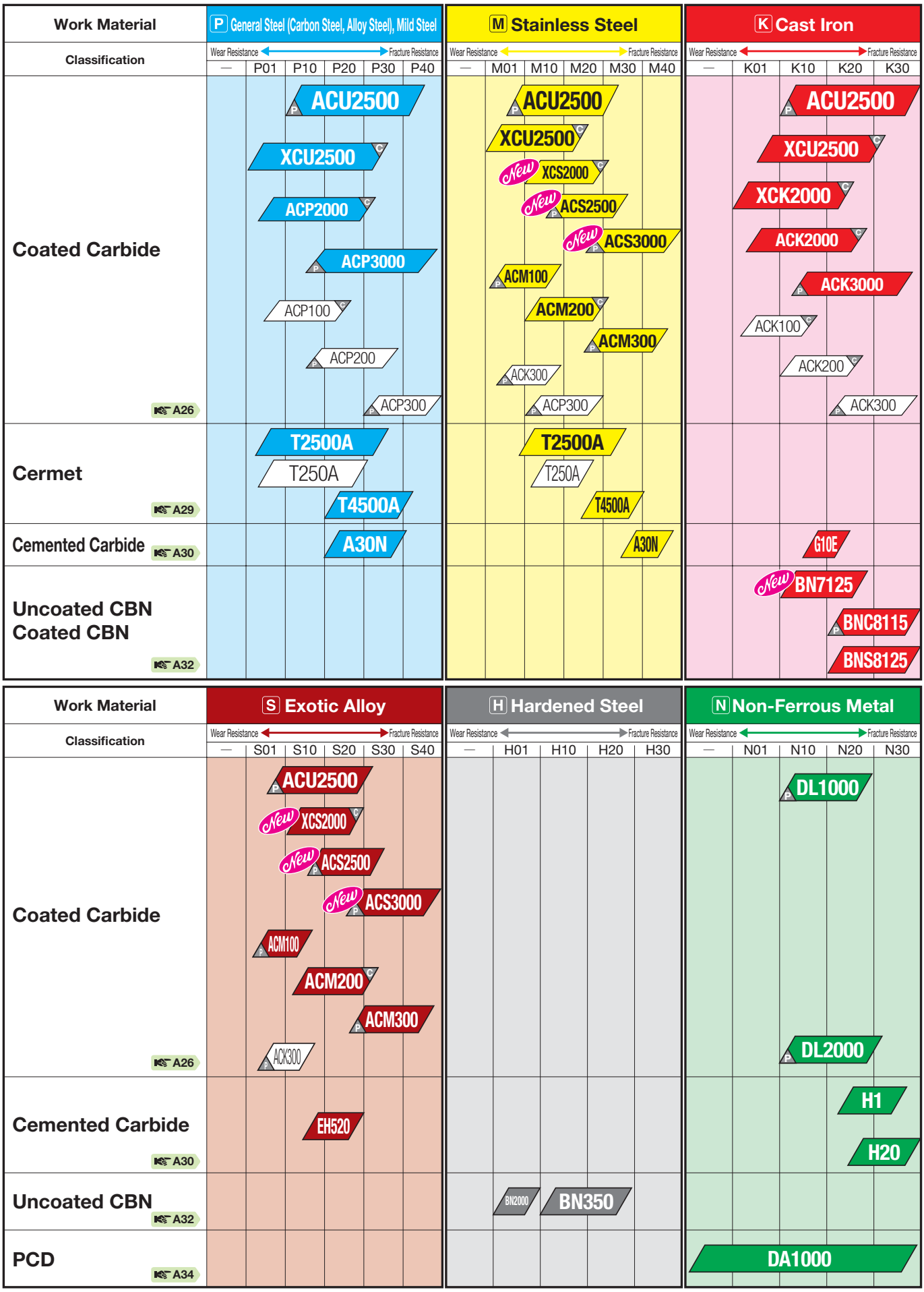
*The number of cutting edges may vary depending on the insert size, etc. Refer to each product page for details.

◎: Best ○: Suitable ×: Unsuitable Blank: Not Recommended

Applications	Cutting Angle / Maximum Depth of Cut	Dia. (mm)	Shank Dia. (mm)	Series (Page)	Model	Insert Shape Example (No. of Cutting Edges)	Rake Angle Axial	Rake Angle Radial	Application: Face Milling General-purpose	Face Milling Finishing	Face Milling High-Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile finishing	Work Material P: General Steel/Carbon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metals	N: Aluminum Alloy	S: Ti Alloy/Heat-Resistant Alloy	H: 45 to 55 HRC Hardened Steel
R/3D Profiling	20 to 47 mm	R10 (ø20) to R25 (ø50)	ø25 to ø50.8	WBMR →H208	**WBMR**2000	(2)	-10°	—					◎				◎		◎	◎	◎	◎				
	30 to 69 mm				**WBMR**2000L																					
	0.1 to 0.4 mm	R5 (ø10) to R15 (ø30)	ø16 to ø32	WBMF →H211	**WBMF**1000	(1)	0°	—					◎				◎	◎	◎	◎						
Side Cutters / T-Slot Cutters	9 to 22 mm 90°	ø21 to ø50	ø25 to ø32	TSE →H218	**TSE**	(2)	0°	0°					○						○	○		○				
Chamfering	45°	ø8 to ø16	ø10 to ø16	WFXC-E →H220	**WFXC**08000E	(4)	0°	0°							◎				◎	◎	◎	◎	◎	◎	○	
	45°	ø25 to ø32	ø25 to ø32		**WFXC**12000E																					
	45°	ø7 to ø35	ø32	SMC →H222	**SMC**	(4)	0°	0°							◎				○	○		○				
Non-Ferrous Metals	3 mm 90°	ø25 to ø50	ø20 to ø32	ANX-E →H232	**ANXS**16000E	(1)	5°	-2° to -0°	○	◎	◎	◎	○						×	×	×	×	◎	◎		×
	16 to 18 mm 90°	ø20 to ø40	ø20 to ø32	WAX-E →H246	**WAX**3000E **WAX**3000EL	(2)	19° to 25°	6°	○			◎	◎	◎			◎		×	×	×	×	○	◎		×
	22 to 24 mm 90°	ø25 to ø40	ø25 to ø32		**WAX**4000E **WAX**4000EL																					

*The number of cutting edges may vary depending on the insert size, etc. Refer to each product page for details.

Grades for Milling



: 1st Recommended Grade / : 2nd Recommended Grade : CVD Coating, : PVD Coating, Blank: Uncoated

Grades for Milling / Characteristic Values

CVD

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (µm)	Features	Old Grade
P Steel	ACP100	89.3	3.1	Super FF Coat	6	· For high-speed machining of steel · Grade emphasising wear resistance for high-speed cutting	AC230
P Steel	ACP2000	89.5	3.2	ABSOTECH	10	· For high-speed machining of steel · Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal crack resistance	ACP100
P Steel	XCU2500	89.5	3.2	ABSOTECH X	6	· General-purpose grade for a wide variety of materials such as steel, cast iron and stainless steel · New coating combining wear and fracture resistance realises long tool life in medium-speed to high-speed machining	–
M Stainless Steel	ACM200	89.8	3.4	Super FF Coat	6	· For machining high-hardness stainless steel · Adopts a newly developed high-strength carbide substrate with excellent wear resistance and thermal resistance, realizing outstanding stability when machining hardened stainless steel	AC230
K Cast Iron	ACK100	92.0	2.4	Super FF Coat	6	· For high-speed cast iron milling · Adopts a high-hardness substrate with high wear resistance	–
K Cast Iron	ACK200	91.7	2.5	Super FF Coat	6	· For high-speed cast iron milling · Adopts a tough carbide substrate with excellent wear resistance and thermal crack resistance	AC211
K Cast Iron	ACK2000	91.7	3.1	ABSOTECH	10	· For high-speed cast iron milling · Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal resistance	ACK100 ACK200
K Cast Iron	XCK2000	91.7	2.5	ABSOTECH X	6	· For high-speed cast iron milling · Along with a high-hardness carbide substrate, the new coating combining wear and fracture resistance realises superb long tool life in medium-speed to high-speed machining	–
S Exotic Alloy	New XCS2000	89.8	3.4	ABSOTECH X	4	· For high-speed machining of exotic alloys · New coating combining wear and fracture resistance realises overwhelming long tool life in medium-speed to high-speed machining	–

PVD

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (µm)	Features	Old Grade
P Steel	ACU2500	91.6	3.8	ABSOTECH	3	· General-purpose grade covering steel, stainless steel, and cast iron machining · Adopts a carbide substrate with excellent fracture resistance and wear resistance, plus a new coating with excellent wear resistance and chipping resistance, realising stable long tool life on various work materials	–
P Steel	ACP200	89.5	3.2	(New) Super ZX Coat	3	· Our 1st recommended grade for steel applications · General-purpose grade with an excellent balance of wear and fracture resistance · Also suitable for machining stainless steel	ACZ330
P Steel	ACP300	89.3	3.1	(New) Super ZX Coat	3	· For interrupted machining of steel · Tough grade with an emphasis on fracture resistance · Also suitable for interrupted machining of stainless steel	ACZ350
P Steel	ACP3000	89.5	3.2	ABSOTECH	3	· Our 1st recommended grade for milling steel · Carbide substrate with excellent thermal crack resistance, plus a new coating with excellent wear resistance and chipping resistance, realises stable long tool life over a wide range of cutting conditions	ACP200 ACP300
M Stainless Steel	ACM100	91.4	3.3	(New) Super ZX Coat	3	· For high-speed machining of stainless steel · Adopts high-hardness micro-grained carbide substrate and super multi-layered coating to realise outstanding wear resistance	ACZ310
M Stainless Steel	ACM300	89.8	3.4	(New) Super ZX Coat	3	· Our 1st recommended grade for milling stainless steel · Adopts a high-strength carbide substrate and super multi-layered coating for next-level wear resistance and fracture resistance	–
K Cast Iron	ACK300	91.4	3.3	(New) Super ZX Coat	3	· General-purpose grade with an excellent balance of wear and fracture resistance	ACZ310
K Cast Iron	ACK3000	91.7	3.1	ABSOTECH	3	· Our 1st recommended grade for milling cast iron · Adopts a high thermal conductivity carbide substrate and a new coating with excellent wear resistance and chipping resistance, realizing stable long tool life over a wide range of cast iron machining operations	ACK300
N Non-Ferrous Metal	DL1000	92.9	2.1	AURORA Coat (DLC)	0.5	· Grade for milling non-ferrous metal, utilising DLC coat with a low coefficient of friction and excellent adhesion resistance	–
N Non-Ferrous Metal	DL2000	91.6	3.8	AURORA Coat (DLC)	0.5	· Grade for milling non-ferrous metal, utilising DLC coat with a low coefficient of friction and excellent adhesion resistance	–
S Exotic Alloy	New ACS2500	90.8	4.2	ABSOTECH	3	· First recommendation for titanium alloy applications · Carbide substrate with excellent wear and adhesion resistance, coupled with a chipping-resistant coating, balances excellent wear and fracture resistance	ACZ310
S Exotic Alloy	New ACS3000	89.8	3.4	ABSOTECH	3	· Suitable for a wide range of exotic alloy machining applications · Realises superb stability due to a high-toughness carbide substrate with a highly chipping-resistant coating	–

Cermet

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (µm)	Features	Old Grade
P Steel	T250A	91.4	2.1	–	–	· For finishing of steel and stainless steel · Tough grade with enhanced crack development resistance	–
P Steel M Stainless Steel	T2500A	91.8	2.4	–	–	· For finishing of steel and stainless steel · Fine, uniform grain structure greatly improves toughness, realising long tool life and excellent surface finishes	T250A
M Stainless Steel	T4500A	91.0	2.3	–	–	· For finishing of steel and stainless steel · Tough grade with excellent fracture resistance and reduced thermal cracking	–

CBN

Work Material	Grade	Binder	CBN Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	TiAlN	Coating Thickness (µm)	Features
K Cast Iron	New BN7125	Co Compound	90 to 95	2	41 to 44	1.9 to 2.0	-	-	General-purpose grade with excellent wear resistance, fracture resistance, and thermal shock resistance, suitable for machining of cast iron and exotic alloys
K Cast Iron	BNS8125	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	-	-	Grade with 100% solid CBN structure that exhibits excellent wear and fracture resistance
K Cast Iron	BNC8115	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	TiAlN	2	Grade with 100% solid CBN structure, using PVD coating with excellent wear resistance to enable roughing operations.
K Cast Iron	BN500	TiC	65 to 70	6	32 to 34	1.0 to 1.1	-	-	Grade optimised for cast iron cutting. Provides superior wear and fracture resistance.
H Hardened Steel	BN350	TiN	60 to 65	1	33 to 35	1.5 to 1.6	-	-	Grade with the highest cutting edge strength, suitable for heavy interrupted cutting.
H Hardened Steel	BN2000	TiN	50 to 55	2	31 to 34	1.1 to 1.2	-	-	General-purpose grade for hardened steel machining with a high degree of fracture and wear resistance.

Polycrystalline Diamond

Work Material	Grade	Binder	CBN Content (%)	Grain Size (µm)	Hardness HK (GPa)	TRS (GPa)	Features
N Non-Ferrous Metal	DA1000	Co	90 to 95	up to 0.5	50 to 60	≈ 2.60	High-density sintered material made of ultra-fine grain diamond that exhibits optimum wear and fracture resistance as well as excellent edge sharpness.

Cemented Carbide A30 Ceramics A36

XCS2000/ACS2500/ACS3000

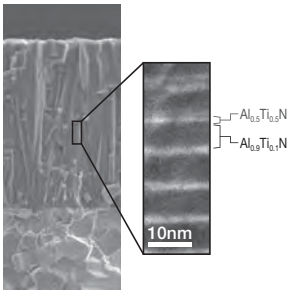
■ Features of XCS2000

· Uses the revolutionary ABSOTECH X coating, combining the wear resistance of conventional CVD coatings and fracture resistance equivalent to that of PVD coatings.
· Realises amazing long tool life in machining of exotic alloys.

■ Features of ACS2500 and ACS3000

· Uses ABSOTECH, a new coating with excellent wear and chipping resistance.
· Its carbide substrate, with excellent fracture and wear resistance, achieves the ultimate in stable long tool life for milling of exotic alloys.

ABSOTECH X CVD

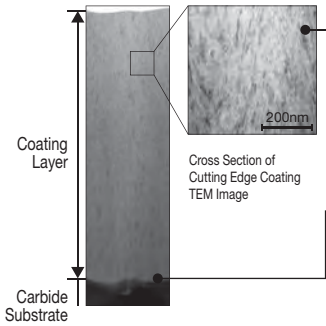


Pure cubic crystal AlTiN with high Al content:
With proprietary structural control technology, differently composed layers of AlTiN are stacked at the nanometre level.
With a high-Al composition containing over 80% Al on average, it also maintains a cubic crystalline structure to achieve excellent thermal resistance and high hardness.
Vastly improved wear resistance.

Special Surface Treatment:
Proprietary surface treatment introduces high compression stress to the coating, suppressing the development of cracks.
Greatly improved fracture and thermal crack resistance.

Applicable Grades: XCS2000

ABSOTECH PVD



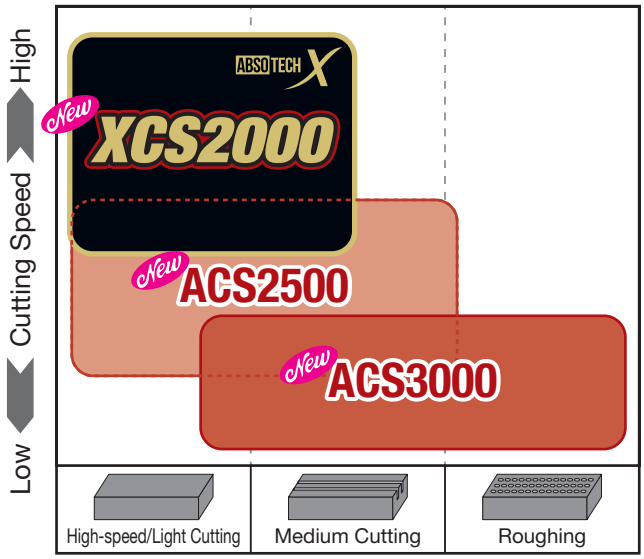
Ultra-fine Grained B Additive
New AlTiBN coating, with an ultra-fine coating structure, achieves high strength and toughness.
Outstanding chipping and wear resistance.

High Adhesion Strength
Significantly improved coating adhesion has more than twice the chipping resistance of conventional coatings.

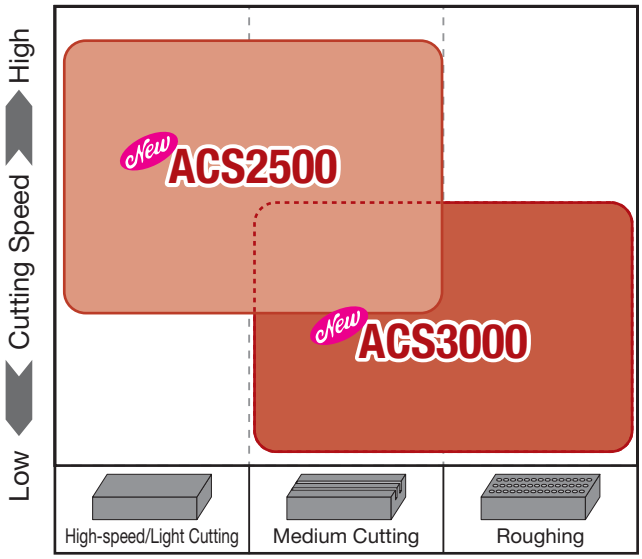
Applicable Grades: ACS2500, ACS3000

■ Application Range

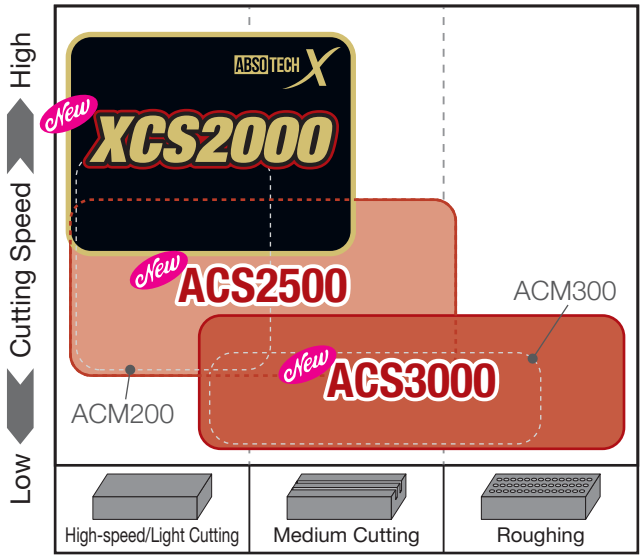
S Heat-Resistant Alloy



S Titanium Alloy



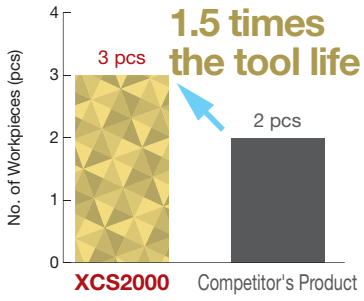
M Stainless Steel



XCS2000/ACS2500/ACS3000

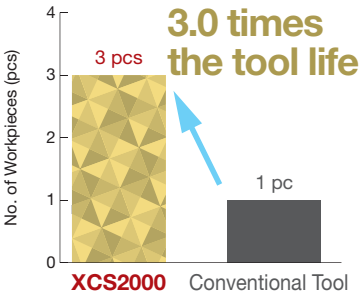
■ Application Examples (XCS2000)

Martensitic Stainless Steel Turbine Blade M



Tool: RSE 12063RS06 Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 270m/min, fz = 0.30mm/t, ap = 2.5mm MQL

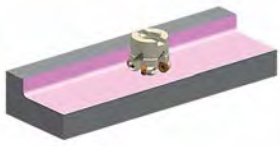
Martensitic Heat Resistant Steel Turbine Blade S

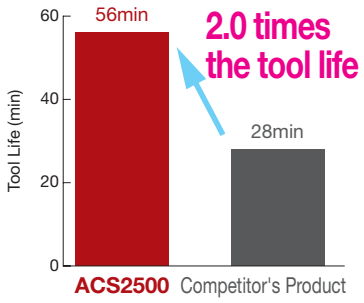


Tool: RSE 12050RS05 RPHT1204M0EN-G
Cutting Conditions: vc = 160m/min, fz = 0.20mm/t, ap = 1.5mm Wet

■ Application Examples (ACS2500/ACS3000)

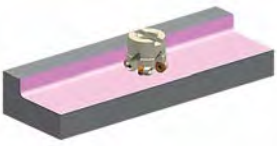
Ti-6Al-4V Aerospace Component S

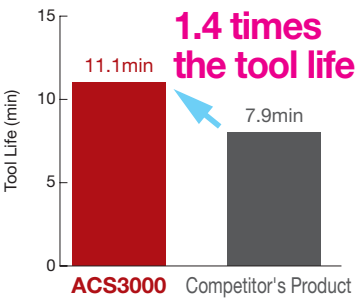




Tool: RSE 12050RS05 Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 60m/min, fz = 0.30mm/t, ap = 3.0mm Wet

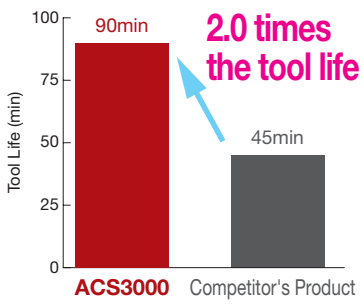
Inconel 718 (44HRC) Block Material S





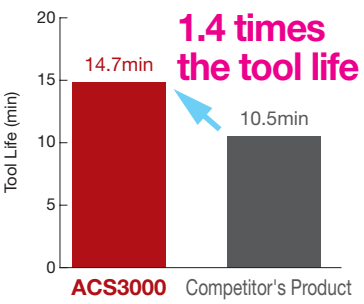
Tool: RSE 12050RS05 Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 40m/min, fz = 0.25mm/t, ap = 2.0mm Wet

Ti-6Al-4V Aerospace Component S



Tool: WSE 16050RS05L Insert: XOMT160540PEER-E
Cutting Conditions: vc = 50m/min, fz = 0.12mm/t, ap = 4.0mm Wet

Precipitation Hardened Stainless Steel (42HRC) Block Material M



Tool: RSE 12050RS05 Insert: RPHT1204M0EN-G
Cutting Conditions: vc = 150m/min, fz = 0.30mm/t, ap = 2.0mm Wet

Cutter Identification Code

Standard Cutters

DFC (F) 09 050 R (S)

(1) (2) (3) (4) (5) (6)

- (1) Series Code — Refer to Table 1
- (2) Additional Symbol — Refer to Table 2
- (3) Insert Inscribed Circle Size — Refer to Table 3
- (4) Cutter Diameter — Refer to Table 4
- (5) Feed Direction — Refer to Table 5
- (6) Mounting — Refer to Table 6

Table 1: (1) Series Code

Representative example
DFC
DGC
WGX
WGC
UFO
FPG
EHG
DNX
APG
WRCX
MSX
PWC
PWS
WFX
WEX
TSX

Table 2: (2) Additional Symbol

Fine-pitch Design	
M	Fine Pitch
F	Extra Fine Pitch

Table 3 (3) Insert Inscribed Circle Size

Inch	Inscribed Circle Dimensions (mm)
3	9.525
4	12.70
5	15.875
6	20.0
Millimetre	**Inscribed Circle Dimensions (mm)**
12	12.7
13	13.5
14	14.0
16	16.0
20	20.0

Inscribed Circle Example

Table 4: (4) Cutter Diameter

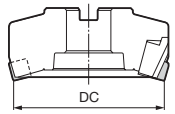


Table 5: (5) Feed Direction

Left Hand (L)	Right Hand (R)

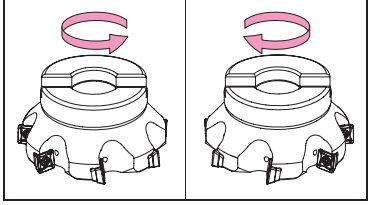


Table 6: (6) Mounting

Mounting	
S	Metric Bore

Milling Cutters (Special Purpose)

DPV (Z) 4 100 (Q) R

(1) (7) (3) (4) (8) (5)

- (1) Series Code: DPV, GFX, NRV, NFV, APV, GRHNM, GRHNF
- (7) 2-piece system: Z
- (3) (4) (5): Same as above
- (8) Quick Change type: Q

Insert Identification Code

(Ex.) **S E M T 13 T3 A G S N-H**

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Insert Shape Refer to Table 1	(2) Relief Angle Refer to Table 2	(3) Tolerance Refer to Table 3	(4) Insert Hole Refer to Table 4	(5) Cutting Edge Length Refer to Table 5	(6) Thickness Refer to Table 6	(7) Cutting Edge Angle Refer to Table 7	(8) Wiper Edge Relief Angle Refer to Table 8	(9) Edge Treatment Refer to Table 9	(10) Feed Direction Refer to Table 10	(11) Additional Information Refer to Table 11

Table 1: (1) Insert Shape

Symbol	Insert Shape	Apex Angle
A	Parallelogram type	85°
H	Hexagonal type	120°
L	Rectangular type	90°
O	Octagonal type	135°
P	Pentagonal type	108°
R	Round type	—
S	Square type	90°
T	Triangular type	60°
Q	Special	—
X	Special	—

Table 2: (2) Relief Angle

Symbol	Relief Angle
N	0°
A	3°
B	5°
C	7°
P	11°
D	15°
E	20°
F	25°
G	30°
O	Special

Table 3: (3) Tolerance

Symbol	Inscribed Circle (mm)	Thickness (mm)
A	±0.025	±0.025
C	±0.025	±0.025
E	±0.025	±0.025
G	±0.025	±0.13
K	±0.05 to ±0.15	±0.025
M	±0.05 to ±0.15	±0.13

Table 4: (4) Insert Hole

Symbol	Shape (Cross Section)
W	
M	
R	
N	
T	

Table 5: (5) Cutting Edge Length

Shape	Cutting Edge Length (ℓ)
S	
T	
R	
H	
A	
O	

Table 6: (6) Thickness

Symbol	Thickness (mm)
02	2.38
03	3.18
T3	3.97
04	4.76
06	6.35

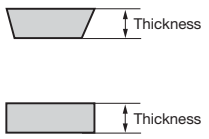


Table 7: (7) Cutting Edge Angle

Symbol	Cutting edge angle
A	45°
D	60°
E	75°
F	85°
H	87°
P	90°
Z	Special

Table 8 (8) Wiper Edge Relief Angle

Symbol	Relief Angle
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
Z	Special

Table 9: (9) Edge Treatment

Symbol	Shape
F	Sharp Edge
E	Round Honing
T	Negative Land
S	Negative Land + Round Honing

Table 10 (10) Feed Direction

Symbol	Feed Direction
N	No
R	Right Hand
L	Left Hand

Table 11 (11) Additional Information (Ex.)

Symbol	Code Description
A	Sharp Edged
H	Strong Edged
W	Large Edge Treatment
S	For WBMR Insert Main Blade

* Exceptions

The above table does not apply to the following insert codes: SPCH42TR, SPCH42R, SPCH53TR, SPCH53R, SDKN42MT, SDKN42M, SDKN53MT, SDKN53M, SEKN42MT, SEKN42M, SEKN53MT and SEKN53M.

For example,

· although "H" and "K" indicate precision tolerances, the main cutting edges have general precision.
· "M" in this instance represents the Neutral Hand insert.
· "T" in this instance represents negative land edge treatment.
· "R" indicates the feed direction (right hand).

VIDEO OF CUTTING

■ Features

SEC-WaveMill WGX series employs a unique chipbreaker design to provide lower cutting force and higher-quality surface finish than conventional tools.
Lineup of insert grades and chipbreakers has been significantly expanded, and employment of the ACM series enables machining of stainless steel and exotic alloys.
Also applicable to any work material, using the general-purpose grade ACU2500.

● Reduced Cutting Force

· High-rake chipbreaker designed for use with the WGX series achieves low cutting force

● High Quality

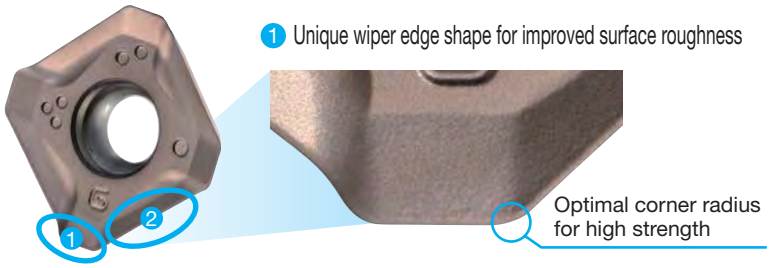
· Improved runout precision and unique wiper edge shape ensure excellent surface finish quality
· Additional edge chamfer reduces burrs and edge chipping

● Wide Ranging Product Lineup

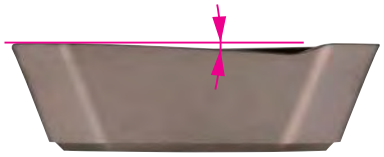
·A wide selection of grades along with 4 types of chipbreakers and wiper inserts are available.
·Can be used for a wide variety of machining applications.

■ Insert Shape Features

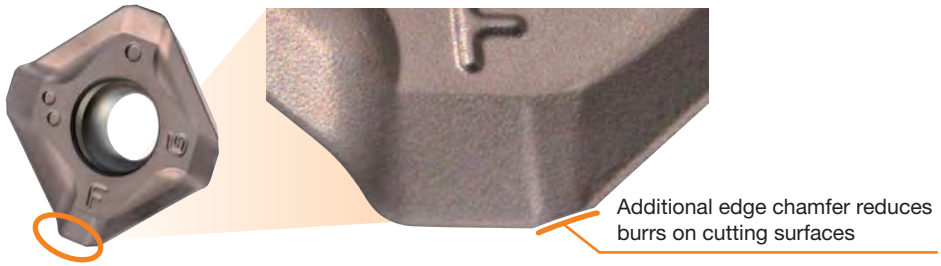
● General-purpose G type Chipbreaker



2 Large rake angle and cutting edge rake angle for improved sharpness



● FG type Chipbreaker with Low-Burr Design



■ Product Range

Type	Cat. No.	Description	Dia. (mm)									
			ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø160	ø200	ø250
Shell	WGX13000R (Inch)	Standard Pitch					4	5	6	7	8	10
	WGX13000RS	Standard Pitch		3	3	4	4	5	6	7	8	10
	WGXM13000R (Inch)	Fine Pitch					6	7	8	10	12	14
	WGXM13000RS	Fine Pitch			4	5	6	7	8	10	12	14
	WGXF13000R (Inch)	Extra Fine Pitch					8	10	12	16	20	24
	WGXF13000RS	Extra Fine Pitch			5	6	8	10	12	16	20	24
Shank	WGX13000EW	Shank type	3	3	4	5						

Number in ●● shows the number of teeth
Sizes of ø125mm and below have coolant holes
(Inch) Inch Bore
For the shell type, left-handed tools can also be manufactured.

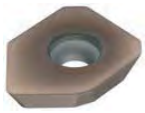
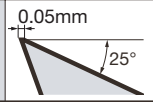
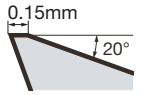
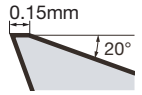
WGX 13000R(S)
Standard Pitch

WGXM 13000R(S)
Fine Pitch

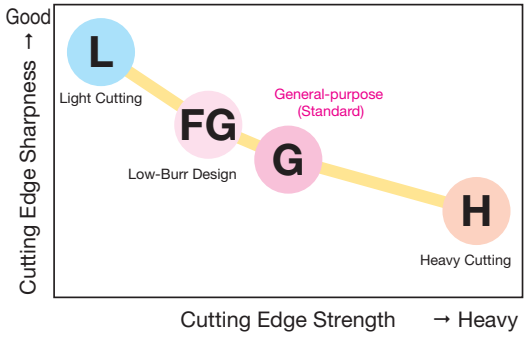
WGXF 13000R(S)
Extra Fine Pitch

WGX 13000EW
Shank type

■ Chipbreaker Selection

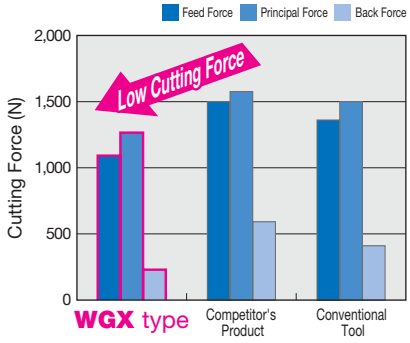
Work Material	P M K S N	P M K S			P K
Applications	Light Cutting	General-purpose/ Burr Prevention	General-purpose	Heavy Cutting	Surface Finish Emphasised
Features	Low Cutting Force	Standard / With Chamfer	Standard	High Strength	Wiper
	L type	**FG type**	**G type**	**H type**	**WR type**
Chipbreaker					
Cutting Edge Cross Section					

■ Chipbreaker Selection Guide



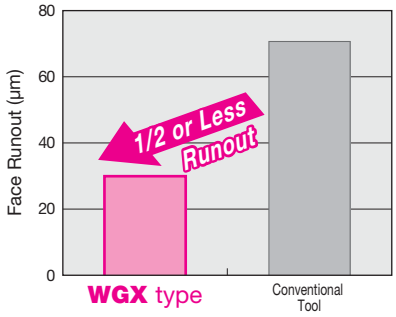
■ Cutting Performance

● Comparison of Cutting Force (G type)



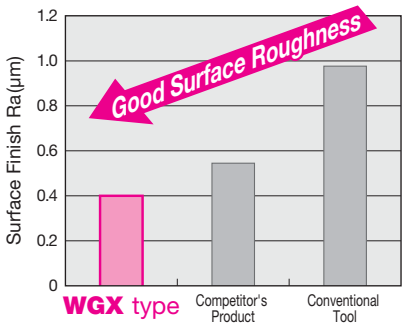
Work Material: S50C, Tool: ø100
Cutting Conditions: vc = 200m/min, fz = 0.2mm/t, ap = 3.0mm

● Runout with Insert Attached (G type)



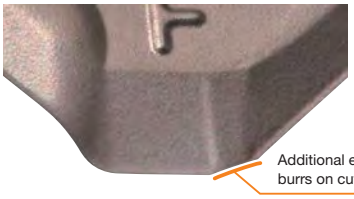
Tool: WGXM13100R (ø100)
Number of Teeth: 7

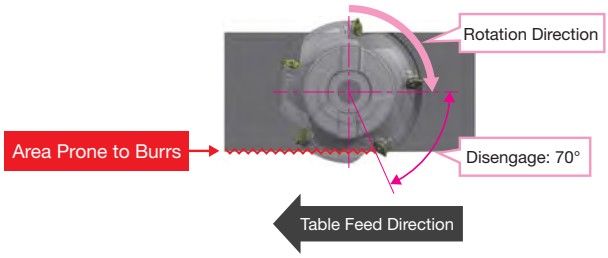
● Surface Finish Comparison (WR type)



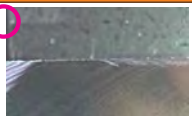
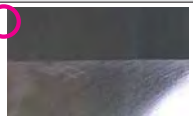
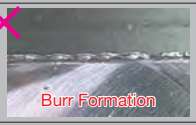
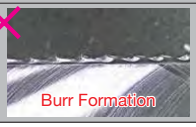
Work Material: S50C, Tool: ø100
Cutting Conditions: vc = 200m/min, fz = 0.2mm/t, ap = 3.0mm

● FG type Chipbreaker with Low-Burr Design





● Machined Surface Comparison

Work Material	FG type	G type	Conventional Tool	Competitor's Product
S50C	○ 	○	○ 	× Burr Formation
SUS304	○	○	× Burr Formation	×  Burr Formation
SCM440	○	× Burr Formation	× Burr Formation	×  Burr Formation

Machine: Machining Centre BT50
Tool: WGX13100R (ø100),
Insert Grade: ACP200
Cutting Conditions:
vc = 200m/min,
fz = 0.2mm/t,
ap = 3.0mm,
ae = 80mm, Dry

■ Precautions when Using Wiper Inserts with Holes

- When mounting the wiper insert, attach it as shown in Fig 1. When mounted as shown in Fig 2, normal machined surface roughness cannot be obtained.
- The wiper insert has a single corner specification.
- Refer to page N19 of Technical Guidance for details about milling with wiper inserts.

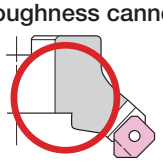
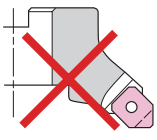
Fig 1 

Fig 2 

WGX 13000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
Rake	Radial	-20° to -24°
Angle	Axial	20° to 22°

6mm 45°

Face Milling

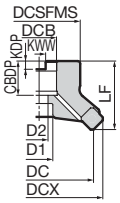
Fig 1 

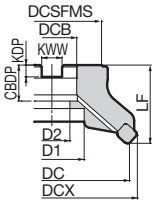
Fig 1' 

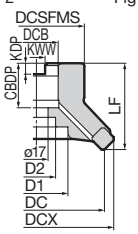
Fig 2 

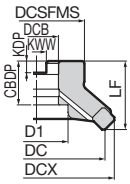
Fig 3 

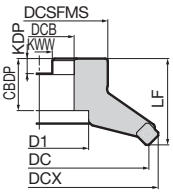
Fig 4 

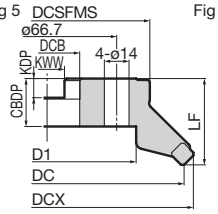
Fig 5 

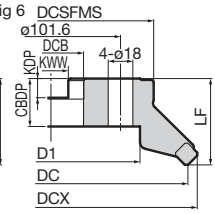
Fig 6 

Figure shows right-handed (R) tool.

Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	WGX 13040RS	●		40	52	32	40	16	8.4	5.6	18	14	9	3	0.3	1
	13050RS	●		50	62	40	40	22	10.4	6.3	20	18	11	3	0.4	1
	13063RS	●		63	76	50	40	22	10.4	6.3	20	18	11	4	0.6	1
	13080RS	●		*80	93	55	50	27	12.4	7	25	20	13.5	4	1.2	1
	13100RS	●		100	113	70	50	32	14.4	8.5	32	46	—	5	1.6	3
	13125RS	●		125	138	80	63	40	16.4	9.5	29	52	29	6	2.8	1'
	13160RS	●		160	173	100	63	40	16.4	9.5	29	88	—	7	4.5	5
	13200RS	●		200	213	130	63	60	25.7	14	35	130	—	8	7.1	6
	13250RS	●		250	263	130	63	60	25.7	14	35	160	—	10	11.2	6
Inch	WGX 13080R	●		*80	93	60	50	25.4	9.5	6	25	20	13	4	1.2	1
	13100R	●		*100	113	70	63	31.75	12.7	8	32.5	46	28	5	2.3	2
	13125R	●		125	138	80	63	38.1	15.9	10	35.5	55	30	6	2.9	1
	13160R	●		160	173	100	63	50.8	19.1	11	38	72	—	7	4.5	4
	13200R	●		200	213	130	63	47.625	25.4	14	35	130	—	8	7.1	6
	13250R	●		250	263	130	63	47.625	25.4	14	35	150	—	10	11.2	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter. Sizes ø160mm and above do not have coolant holes.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	PM KS	PM KM	P			K	K		MS		KN	N			
	Medium Cutting	PM KS	PM KM		PM	PM	K	K		MS	MS		N	P		
	Roughing	PM KS			PM	PM			K		MS					
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Applications	Fig
SEET 13T3AGFR-L		—	—	—	—	—	—	—	—	—	—	●	●	—	Light Cutting (For Non-Ferrous Metals)	1
13T3AGSR-L		●	●	●	●	●	●	●	●	●	●			●	Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●	●	●	●	—	—	●	General-purpose	1
SEMT 13T3AGSR-L		●	●	●	●	●	●	●	●	●	●	—	—	—	Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●	●	●	●	—	—	—	General-purpose	1
13T3AGSR-H		●	●	●	●	●	●	●	●	●	●	—	—	—	Heavy Cutting	1
13T3AGSR-FG		●	●	●	●	●	●	●	●	●	●	—	—	—	Low-burr Design	2
13T3AGSL-G												—	—	—	General-purpose	4
XEEW 13T3AGER-WR		●	●		●		●		●					●	Wiper Insert	3

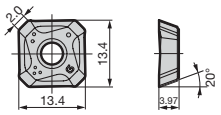
Fig 1 (Right-Hand) 

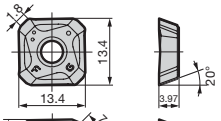
Fig 2 (Right-Hand) 

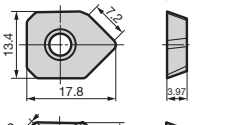
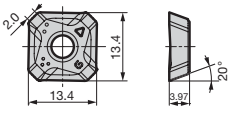
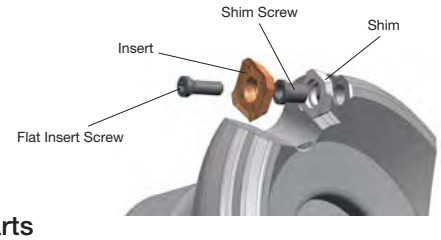
Fig 3 (Right-Hand) Wiper Insert 

Fig 4 (Left-Hand) 

The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance. Refer to H21 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Identification Code

WGX Series Code | **13** Insert Size | **040** Cutter Dia. | **R** Feed Direction | **S** Metric Bore



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.20**-0.30	ACU2500
	Mild Steel	≤ 180HB	180-**270**-350	0.10-**0.25**-0.40	ACP200
	Die Steel	200 to 220 HB	100-**150**-200	0.15-**0.20**-0.25	XCU2500
M	Stainless Steel	—	160-**210**-250	0.15-**0.23**-0.30	ACU2500 ACM300
K	Cast Iron	250HB	100-**180**-250	0.15-**0.23**-0.30	ACU2500 ACK200 XCU2500 XCK2000
N	Non-Ferrous Alloy	—	500-**750**-1,000	0.15-**0.23**-0.30	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	ACU2500 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
DC ø40 to 125	WGCS13R	BW0507F	LH035	BFTX03512IP	3.0	—	HPS1015	TRB15IP	SUMI-P
Other than above						TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m)

WGXM 13000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
Rake	Radial	-20° to -24°
Angle	Axial	20° to 22°

6mm, 45°

Face Milling

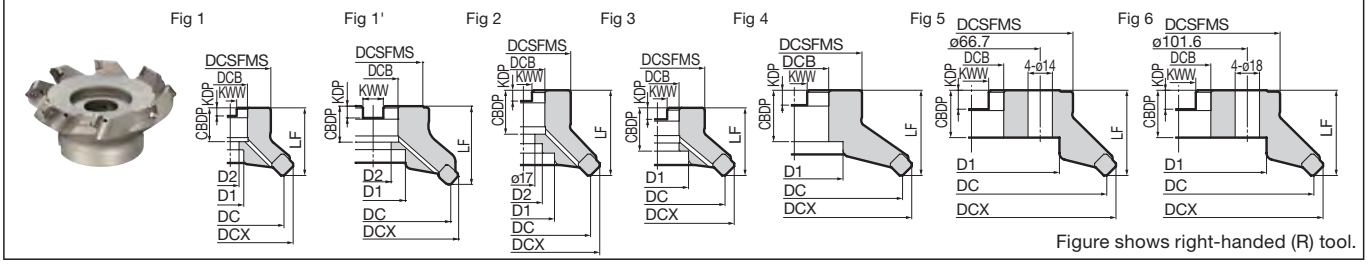


Figure shows right-handed (R) tool.

Body (Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WGXM 13050RS**	●		**50**	62	40	40	**22**	10.4	6.3	20	18	11	4	0.4	1
	13063RS	●		**63**	76	50	40	**22**	10.4	6.3	20	18	11	5	0.6	1
	13080RS	●		***80**	93	55	50	**27**	12.4	7	25	20	13.5	6	1.1	1
	13100RS	●		**100**	113	70	50	**32**	14.4	8.5	32	46	—	7	1.6	3
	13125RS	●		**125**	138	80	63	**40**	16.4	9.5	29	52	29	8	2.8	1'
	13160RS	●		**160**	173	100	63	**40**	16.4	9.5	29	88	—	10	4.5	5
	13200RS	●		**200**	213	130	63	**60**	25.7	14	35	130	—	12	7.0	6
	13250RS	●		**250**	263	130	63	**60**	25.7	14	35	160	—	14	11.1	6
Inch	**WGXM 13080R**	●		***80**	93	60	50	**25.4**	9.5	6	25	20	13	6	1.1	1
	13100R	●		***100**	113	70	63	**31.75**	12.7	8	32.5	46	28	7	2.2	2
	13125R	●		**125**	138	80	63	**38.1**	15.9	10	35.5	55	30	8	2.9	1
	13160R	●		**160**	173	100	63	**50.8**	19.1	11	38	72	—	10	4.5	4
	13200R	●		**200**	213	130	63	**47.625**	25.4	14	35	130	—	12	7.0	6
	13250R	●		**250**	263	130	63	**47.625**	25.4	14	35	150	—	14	11.1	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter. Sizes ø160mm and above do not have coolant holes.

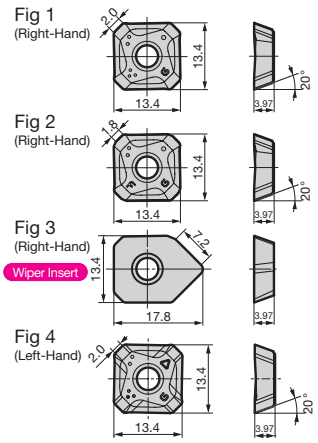
Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

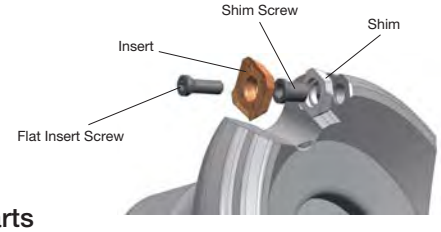
Grade Classification		Coated Carbide									Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	PS PM	PM KM	P			K	K		MS	KN	N			
	Medium Cutting	PS PM	PM KM		PM	PM	K	K		MS	MS	N	P		
	Roughing	PS PM			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Applications	Fig
SEET 13T3AGFR-L		—	—	—	—	—	—	—	—	—	—	●	●	—	Light Cutting (For Non-Ferrous Metals)	1
13T3AGSR-L		●	●	●	●	●	●	●	●	●	●			●	Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●	●	●	●	—	—	●	General-purpose	1
SEMT 13T3AGSR-L		●	●	●	●	●	●	●	●	●	●	—	—	—	Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●	●	●	●	—	—	—	General-purpose	1
13T3AGSR-H		●	●	●	●	●	●	●	●	●	●	—	—	—	Heavy Cutting	1
13T3AGSR-FG		●	●	●	●	●	●	●	●	●	●	—	—	—	Low-burr Design	2
13T3AGSL-G												—	—	—	General-purpose	4
XEEW 13T3AGER-WR		●	●		●		●		●					●	Wiper Insert	3



The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance. Refer to H21 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Identification Code

WGX Series Code | **M** Fine Pitch | **13** Insert Size | **050** Cutter Dia. | **R** Feed Direction | **S** Metric Bore



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.20**-0.30	ACU2500
	Mild Steel	≤ 180HB	180-**270**-350	0.10-**0.25**-0.40	ACP200
	Die Steel	200 to 220 HB	100-**150**-200	0.15-**0.20**-0.25	XCU2500
M	Stainless Steel	—	160-**210**-250	0.15-**0.23**-0.30	ACU2500 ACM300
K	Cast Iron	250HB	100-**180**-250	0.15-**0.23**-0.30	ACU2500 ACK200 XCU2500 XCK2000
N	Non-Ferrous Alloy	—	500-**750**-1,000	0.15-**0.23**-0.30	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	ACU2500 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Integrated Wrench	Detachable Wrench Handle Grip	Detachable Wrench Bit	Anti-seizure Cream
DC ø50 to 125	WGCS13R	BW0507F	LH035	BFTX03512IP	N·m 3.0	—	HPS1015	TRB15IP	SUMI-P
Other than above						TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m)

WGXF 13000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-20° to -24°
	Axial	20° to 22°

6mm 45°

Face Milling

Fig 1 Fig 1' Fig 2 Fig 3 Fig 4 Fig 5 Fig 6

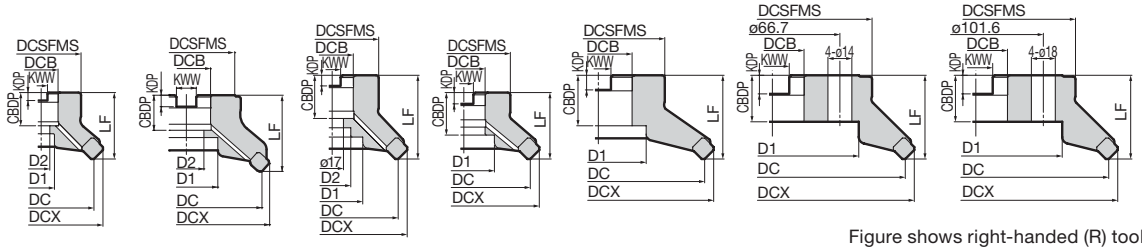


Figure shows right-handed (R) tool.

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WGXF 13050RS**	●		**50**	62	40	40	**22**	10.4	6.3	20	18	11	5	0.4	1
	13063RS	●		**63**	76	50	40	**22**	10.4	6.3	20	18	11	6	0.6	1
	13080RS	●		***80**	93	55	50	**27**	12.4	7	25	20	13.5	8	1.1	1
	13100RS	●		**100**	113	70	50	**32**	14.4	8.5	32	46	—	10	1.5	3
	13125RS	●		**125**	138	80	63	**40**	16.4	9.5	29	52	29	12	2.7	1'
	13160RS	●		**160**	173	100	63	**40**	16.4	9.5	29	88	—	16	4.5	5
	13200RS	●		**200**	213	130	63	**60**	25.7	14	35	130	—	20	6.9	6
	13250RS	●		**250**	263	130	63	**60**	25.7	14	35	160	—	24	11.0	6
Inch	**WGXF 13080R**	●		***80**	93	60	50	**25.4**	9.5	6	25	20	13	8	1.1	1
	13100R	●		***100**	113	70	63	**31.75**	12.7	8	32.5	46	28	10	2.1	2
	13125R	●		**125**	138	80	63	**38.1**	15.9	10	35.5	55	30	12	2.8	1
	13160R	●		**160**	173	100	63	**50.8**	19.1	11	38	72	—	16	4.5	4
	13200R	●		**200**	213	130	63	**47.625**	25.4	14	35	130	—	20	6.9	6
	13250R	●		**250**	263	130	63	**47.625**	25.4	14	35	150	—	24	11.0	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter. Sizes ø160mm and above do not have coolant holes.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide									Cemented Carbide	DLC	Cermet
Process	High-speed/Light Cutting	PKMS	PKM	P			K	K		MS	KN	N	
	Medium Cutting	PKMS	PKM		PM	PM	K	K		MS		N	P
	Roughing	PKMS			PM	PM			K		MS		

Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Applications	Fig
SEET 13T3AGFR-L	—	—	—	—	—	—	—	—	—	—	●	●	—	Light Cutting (For Non-Ferrous Metals)	1
13T3AGSR-L	●	●	●	●	●	●	●	●	●	●			●	Light Cutting	1
13T3AGSR-G	●	●	●	●	●	●	●	●	●	●	—	—	●	General-purpose	1
SEMT 13T3AGSR-L	●	●	●	●	●	●	●	●	●	●	—	—	—	Light Cutting	1
13T3AGSR-G	●	●	●	●	●	●	●	●	●	●	—	—	—	General-purpose	1
13T3AGSR-H	●	●	●	●	●	●	●	●	●	●	—	—	—	Heavy Cutting	1
13T3AGSR-FG	●	●	●	●	●	●	●	●	●	●	—	—	—	Low-burr Design	2
13T3AGSL-G											—	—	—	General-purpose	4
XEEW 13T3AGER-WR	●	●		●		●		●					●	Wiper Insert	3

Fig 1 (Right-Hand)

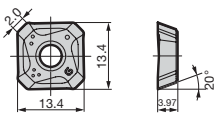


Fig 2 (Right-Hand)

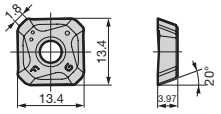


Fig 3 (Right-Hand) Wiper Insert

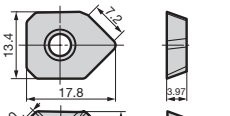
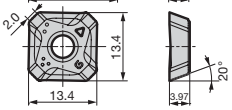


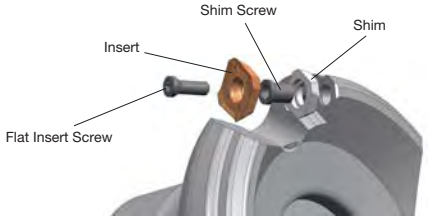
Fig 4 (Left-Hand)



The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance. Refer to H21 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Identification Code

WGX Series Code | **F** Extra Fine Pitch | **13** Insert Size | **050** Cutter Dia. | **R** Feed Direction | **S** Metric Bore



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.20**-0.30	ACU2500
	Mild Steel	≤ 180HB	180-**270**-350	0.10-**0.25**-0.40	ACP200
	Die Steel	200 to 220 HB	100-**150**-200	0.15-**0.20**-0.25	XCU2500
M	Stainless Steel	—	160-**210**-250	0.15-**0.23**-0.30	ACU2500 ACM300
K	Cast Iron	250HB	100-**180**-250	0.15-**0.23**-0.30	ACU2500 ACK200 XCU2500 XCK2000
N	Non-Ferrous Alloy	—	500-**750**-1,000	0.15-**0.23**-0.30	DL1000
S	Exotic Alloy	—	30-**50**-80	0.10-**0.20**-0.30	ACU2500 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Integrated Wrench	Detachable Wrench Handle Grip	Detachable Wrench Bit	Anti-seizure Cream
DC ø50 to 125	WGCS13R	BW0507F	LH035	BFTX03512IP	3.0	—	HPS1015	TRB15IP	SUMI-P
Other than above						TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m)

SEC-WaveMill

WGX 13000EW type

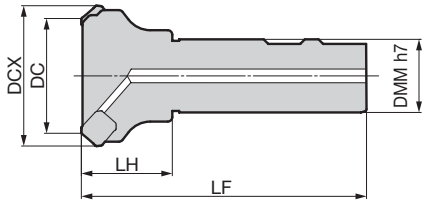
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Rake Angle	Radial	-20° to -24°
	Axial	20° to 22°

6mm 45°

Face Milling

Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
WGX 13032EW	●	**32**	44	32	40	125	3	1
13040EW	●	**40**	52	32	40	125	3	1
13050EW	●	**50**	62	32	40	125	4	1
13063EW	●	**63**	76	32	40	125	5	1

Inserts are sold separately. ø32mm size does not have shims.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide									Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	PS PM	PK PM	P			K	K		MS		N			
	Medium Cutting	PS PM	PK PM		PM	PM	K	K		MS	MS	N	P		
	Roughing	PS PM			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Applications	Fig
SEET 13T3AGFR-L		—	—	—	—	—	—	—	—	—	—	●	●	—	Light Cutting (For Non-Ferrous Metals)	1
13T3AGSR-L		●	●	●	●	●	●	●	●	●	●			●	Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●	●	●	●	—	—	●	General-purpose	1
SEMT 13T3AGSR-L		●	●	●	●	●	●	●	●	●	●	—	—	—	Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●	●	●	●	—	—	—	General-purpose	1
13T3AGSR-H		●	●	●	●	●	●	●	●	●	●	—	—	—	Heavy Cutting	1
13T3AGSR-FG		●	●	●	●	●	●	●	●	●	●	—	—	—	Low-burr Design	2
XEEW 13T3AGER-WR		●	●		●		●		●					●	Wiper Insert	3

Fig 1

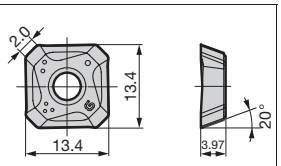


Fig 2

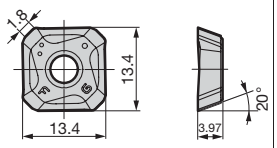
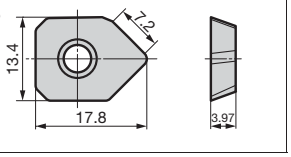


Fig 3

Wiper Insert

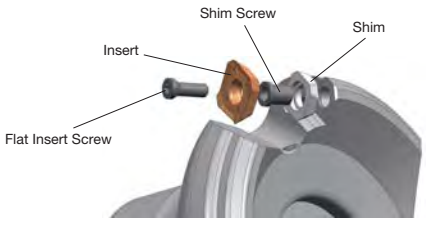


The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance.
Refer to H21 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Identification Code

WGX **13** **032** **EW**

Series Code | Insert Size | Cutter Dia. | Shank type



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.20**-0.30	ACU2500
	Mild Steel	≤ 180HB	180-**270**-350	0.10-**0.25**-0.40	ACP200
	Die Steel	200 to 220 HB	100-**150**-200	0.15-**0.20**-0.25	XCU2500
M	Stainless Steel	—	160-**210**-250	0.15-**0.23**-0.30	ACU2500 ACM300
K	Cast Iron	250HB	100-**180**-250	0.15-**0.23**-0.30	ACU2500 ACK200 XCU2500 XCK2000
N	Non-Ferrous Alloy	—	500-**750**-1,000	0.15-**0.23**-0.30	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	ACU2500 ACM300

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WGX13032EW type	—	—	—	BFTX03512IP	3.0	TRDR15IP	SUMI-P
Other than above	WGCS13R	BW0507F	LH035				

N·m Recommended Tightening Torque (N·m)

WGC 3000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

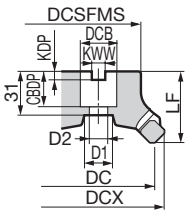
Rake Angle	Radial	-10° to -19°
	Axial	20°

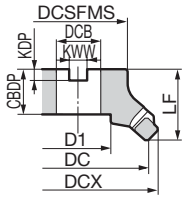
4mm 45°

Face Milling

Fig 1

Fig 2





Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	WGC 3032RS	●	32	41	32	40	16	8.4	5.6	18	14	9	4	—	1
	3040RS	●	40	49	32	40	16	8.4	5.6	18	14	9	4	—	1
	3050RS	●	50	59	40	40	22	10.4	6.3	20	18	11	5	—	1
	3063RS	●	63	72	50	40	22	10.4	6.3	20	18	11	6	—	1
Inch	WGC 3080R	●	80	89	60	50	25.4	9.5	6	25	20	13	6	1.1	1
	3100R	●	100	109	70	50	31.75	12.7	8	32	46	—	7	1.5	2

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

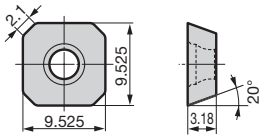
Insert

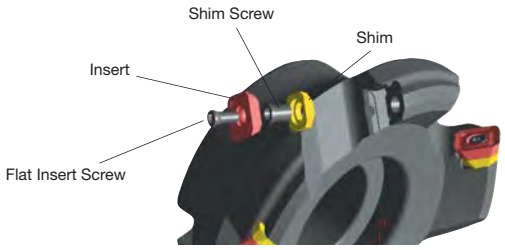
Dimensions (mm)

Grade Classification		Coated Carbide					DLC	Cemented Carbide			Cermet	SUMIDIA		
Process	High-speed/Light Cutting	P			K		N			KN		N	N	
	General-purpose		PM	PM	K		N	P	KS		P	N	N	
	Roughing		PM	PM		K						N	N	
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	DL1000	A30N	EH520	H1	T250A	DA1000	DA2200	Fig
SEET 0903AGFN-L		●	●	●	●	●	●			●		—	—	1
0903AGSN-G		●	●	●	●	●			●		●	—	—	1
0903AGSN-N		●	●	●	●	●					●	—	—	1
SEMT 0903AGSN-L		●	●	●	●	●	—			—	—	—	—	1
0903AGSN-G		●	●	●	●	●	—	●		—	—	—	—	1

Refer to H21 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Fig 1





Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure Cream
		Handle Grip	Bit	
BFTX0307IP	2.0	HPS1015	TRB10IP	SUMI-P

Recommended Cutting Conditions

WGC3000RS type

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.15**-0.20	ACP200
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.18**-0.25	ACP200
	Die Steel	200 to 220HB	100-**150**-200	0.15-**0.18**-0.20	ACP200
M	Stainless Steel	—	160-**200**-250	0.15-**0.18**-0.20	ACP300
K	Cast Iron	250HB	100-**200**-250	0.15-**0.18**-0.20	ACK200
N	Non-Ferrous Alloy	—	300-**500**-1,000	0.15-**0.18**-0.20	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	EH520

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

WGC(F) 4000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-20° to -24°
	Axial	20° to 22°

6mm 45°

Face Milling

Fig 1

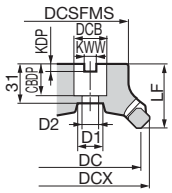


Fig 2

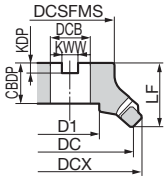
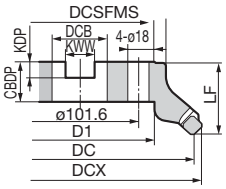


Fig 3



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WGC 4040RS**	●	**40**	52	32	40	**16**	8.4	5.6	18	14	9	3	—	1
	4050RS	●	**50**	62	40	40	**22**	10.4	6.3	20	18	11	3	—	1
	4063RS	●	**63**	76	50	40	**22**	10.4	6.3	20	18	11	4	—	1
Inch	**WGC 4080R**	●	**80**	93	60	50	**25.4**	9.5	6	25	20	13	4	1	1
	4100R	●	**100**	113	70	50	**31.75**	12.7	8	32	46	—	5	1.5	2
	4125R	●	**125**	138	80	63	**38.1**	15.9	10	38	56	—	6	2.6	2
	4160R	●	**160**	173	100	63	**50.8**	19.1	11	38	72	—	7	4	2
	4200R	●	**200**	213	130	63	**47.625**	25.4	14	35	130	—	8	6.6	3

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WGCF 4050RS**	●	**50**	62	40	40	**22**	10.4	6.3	20	18	11	5	—	1
	4063RS	●	**63**	76	50	40	**22**	10.4	6.3	20	18	11	6	—	1
Inch	**WGCF 4080R**	●	**80**	93	60	50	**25.4**	9.5	6	25	20	13	8	1	1
	4100R	●	**100**	113	70	50	**31.75**	12.7	8	32	46	—	10	1.5	2
	4125R	●	**125**	138	80	63	**38.1**	15.9	10	38	56	—	12	2.6	2
	4160R	●	**160**	173	100	63	**50.8**	19.1	11	38	72	—	16	4	2
	4200R	●	**200**	213	130	63	**47.625**	25.4	14	35	130	—	20	6.6	3

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide					DLC	Cemented Carbide			Cermet	SUMIDIA		
Process	High-speed/Light Cutting	P			K		N			K/N		N	N	
	General-purpose		P/M	P/M	K		N	P	K/S		P	N	N	
	Roughing		P/M	P/M		K						N	N	
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	DL1000	A30N	EH520	H1	T250A	DA1000	DA2200	Fig
SEET 13T3AGFN-L		●	●	●	●	●	●		●	●		—	—	1
13T3AGSN-G		●	●	●	●	●			●		●	—	—	1
13T3AGSN-N		●	●	●	●	●		●			●	—	—	1
SEMT 13T3AGSN-L		●	●	●	●	●	—			—	—	—	—	1
13T3AGSN-G		●	●	●	●	●	—	●		—	—	—	—	1
13T3AGSN-H		●	●	●	●	●	—			—	—	—	—	1
NF-SECW 13T3AGTN-N		—	—	—	—	—	—	—	—	—	—	●	▲	1
NF-XEEW 13T3AGFR-W		—	—	—	—	—	—	—	—	—	—	●	▲	2
XEEW 13T3AGER-W						●					●	—	—	2

Fig 1

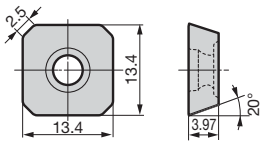
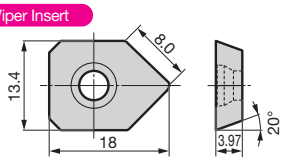


Fig 2

Wiper Insert



Refer to H21 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Recommended Cutting Conditions for WGC4000RS/WGCF4000RS type

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.20**-0.30	ACP200
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.25**-0.40	ACP200
	Die Steel	200 to 220HB	100-**150**-200	0.15-**0.20**-0.25	ACP200
M	Stainless Steel	—	160-**200**-250	0.15-**0.23**-0.30	ACP300
K	Cast Iron	250HB	100-**200**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	300-**500**-1,000	0.15-**0.18**-0.20	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	EH520

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Integrated Wrench	Detachable Wrench Handle Grip	Detachable Wrench Bit	Anti-seizure Cream
WGC(F) 4080R to WGC(F) 4125R	WGCS13R	BW0507F	LH035	BFTX03512IP	3.0	—	HPS1015	TRB15IP	SUMI-P
WGC(F) 4160R to WGC(F) 4200R	WGCS13R	BW0507F	LH035	BFTX03512IP	3.0	TRDR15IP	—	—	
WGC 4000RS to WGCF 4000RS	WGCS13R	BW0507F	LH035	BFTX03512IP	3.0	—	HPS1015	TRB15IP	

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

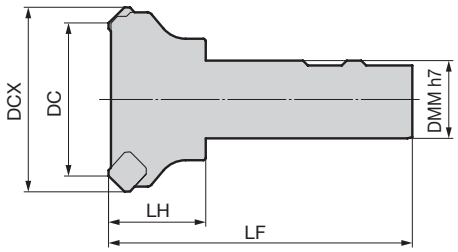
WGC 3000EW/4000EW type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		(3000 type)	(4000 type)
	Radial	-10° to -19°	-20° to -24°
	Axial	20°	20° to 22°

4mm 45° (3000 type) | 6mm 45° (4000 type) | Face Milling

Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
WGC 3020EW	●	**20**	29	20	40	100	2	1
3025EW	●	**25**	34	20	40	100	3	1
3032EW	●	**32**	41	32	40	125	4	1
3040EW	●	**40**	49	32	40	125	4	1
3050EW	●	**50**	59	32	40	125	5	1
3063EW	●	**63**	72	32	40	125	6	1

Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
WGC 4032EW	●	**32**	44	32	40	125	3	1
4040EW	●	**40**	52	32	40	125	3	1
4050EW	●	**50**	62	32	40	125	4	1
4063EW	●	**63**	76	32	40	125	5	1

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide					DLC	Cemented Carbide			Cermet	SUMIDIA			
Process	High-speed/Light Cutting	P			K		N			N		N	N		
	General-purpose		P M	M	K		N	P	S		P	N	N		
	Roughing		P M	P M		K						N	N		
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	DL1000	A30N	EH520	H1	T250A	DA1000	DA2200	Applicable Cutter	Fig
SEET 0903AGFN-L		●	●	●	●	●	●			●		—	—	WGC3000 type	1
0903AGSN-G		●	●	●	●	●			●		●	—	—		1
0903AGSN-N		●	●	●	●	●					●	—	—		1
SEMT 0903AGSN-L		●	●	●	●	●	—			—	—	—	—		1
0903AGSN-G		●	●	●	●	●	—	●		—	—	—	—		1
SEET 13T3AGFN-L		●	●	●	●	●	●		●	●		—	—	WGC4000 type WGCF4000 type	2
13T3AGSN-G		●	●	●	●	●			●		●	—	—		2
13T3AGSN-N		●	●	●	●	●		●			●	—	—		2
SEMT 13T3AGSN-L		●	●	●	●	●	—			—	—	—	—		2
13T3AGSN-G		●	●	●	●	●	—	●		—	—	—	—		2
13T3AGSN-H		●	●	●	●	●	—			—	—	—	—		2
NF-SECW 13T3AGTN-N		—	—	—	—	—	—	—	—	—	—	●	▲		2
NF-XEEW 13T3AGFR-W		—	—	—	—	—	—	—	—	—	—	●	▲		3
XEEW 13T3AGER-W						●					●	—	—		3

Fig 1

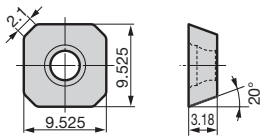


Fig 2

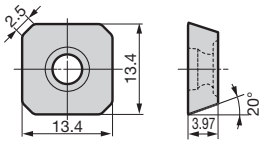
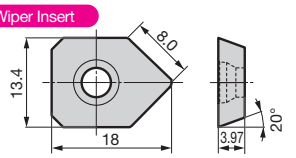


Fig 3

Wiper Insert



Refer to H21 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Recommended Cutting Conditions

WGC3000EW type

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.15**-0.20	ACP200
P	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.18**-0.25	ACP200
P	Die Steel	200 to 220HB	100-**150**-200	0.15-**0.18**-0.20	ACP200
M	Stainless Steel	—	160-**200**-250	0.15-**0.18**-0.20	ACP300
K	Cast Iron	250HB	100-**200**-250	0.15-**0.18**-0.20	ACK200
N	Non-Ferrous Alloy	—	300-**500**-1,000	0.15-**0.18**-0.20	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	EH520

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WGC4000EW type

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.20**-0.30	ACP200
P	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.25**-0.40	ACP200
P	Die Steel	200 to 220HB	100-**150**-200	0.15-**0.20**-0.25	ACP200
M	Stainless Steel	—	160-**200**-250	0.15-**0.23**-0.30	ACP300
K	Cast Iron	250HB	100-**200**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	300-**500**-1,000	0.15-**0.18**-0.20	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	EH520

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Wrench	Anti-seizure Cream
					N·m		
WGC 3000EW	—	—	—	BFTX0307IP	2.0	TRDR10IP	SUMI-P
WGC 4032EW				BFTX03512IP	3.0	TRDR15IP	
WGC 4000EW (Except WGC 4032EW)	WGCS13R	BW0507F	LH035	BFTX03512IP	3.0	TRDR15IP	

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

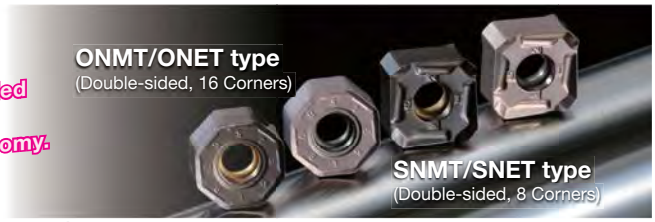
MEMO

DGC series

VIDEO OF CUTTING

■ Features

SEC-Sumi Dual Mill DGC series employs double-sided inserts with up to 16 corners for excellent economy. This is a general-purpose cutter featuring high cutting edge strength for high-efficiency milling and a low-burr chipbreaker design that provides high machined surface quality.

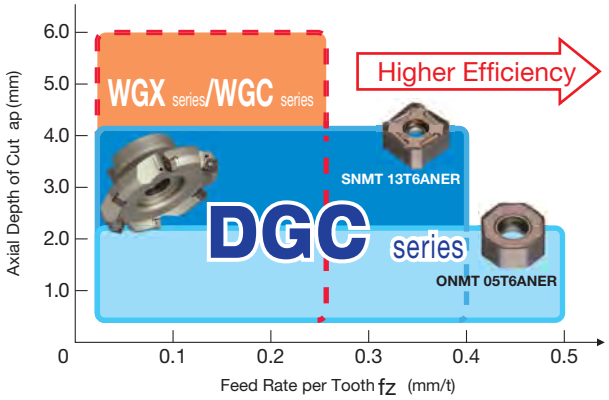


The DGC series insert lineup includes double-sided SNMT/SNET and ONMT/ONET types. Up to 16 corners can be used for improved economy.

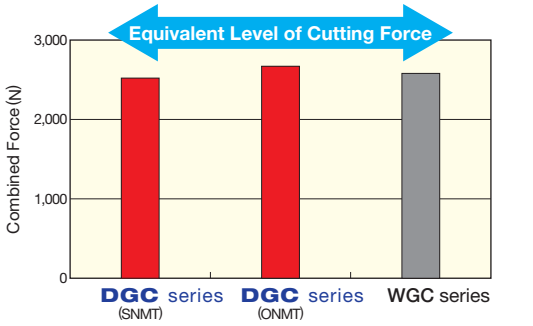
● Same cutting performance as single-sided inserts plus superior economy

Achieves levels of cutting edge sharpness and machined surface quality equivalent to single-sided cutters at a maximum depth of cut of ap = 3mm.

● Application Range for General Steel Machining



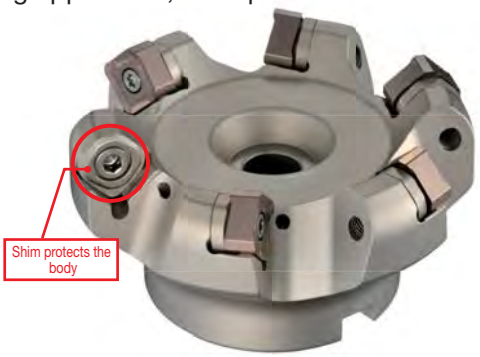
● Comparison of Cutting Force



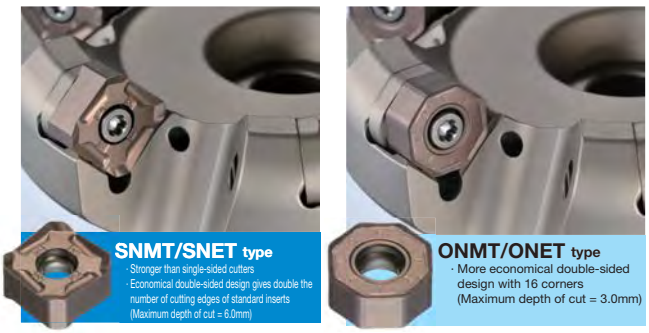
Work Material: SCM435 Tool: ø100
Cutting Conditions: VC = 200m/min, fz = 0.3mm/t, ap = 3mm, ae = 85mm

● Dual-purpose body features

Two types of inserts can be used with a single body depending on the milling application, to help reduce tool costs.



Use two types of insert for different applications



● General-purpose grade applicable to any work material

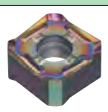
Introducing the new grade ACU2500, which is applicable to a wide variety of processes and work materials such as steel, stainless steel and cast iron.

■ Product Range

Type	Cat. No.	Dia. (mm)								
		ø40	ø50	ø63	ø80	ø100	ø125	ø160	ø200	ø250
Shell	DGC 13000RS	3	3	4	4	5	6	7	8	10
	DGC 13000R (Inch)				4	5	6	7	8	10
	DGCM 13000RS		4	5	6	7	8	10	12	14
	DGCM 13000R (Inch)				6	7	8	10	12	14
	DGCF 13000RS		5	6	8	10	12	14	16	18
	DGCF 13000R (Inch)				8	10	12	14	16	18
Shank	DGC 13000EW	3	3	4						

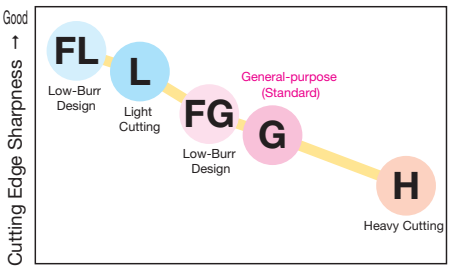
Number in ●● shows the number of teeth (Inch) Inch Bore

■ Chipbreaker Selection

Work Material	P M K S					N	P K
Applications	Light Cutting/ Burr Prevention	Light Cutting	General-purpose/ Burr Prevention	General-purpose	Heavy Cutting	Non-Ferrous Metals	Surface Finish Emphasised
Features	Low Cutting Force / With Chamfer	Low Cutting Force	Standard / With Chamfer	Standard	High Strength	High Rake	Wiper
	FL type	**L type**	**FG type**	**G type**	**H type**	**S type**	**W type**
Chipbreaker							
Cutting Edge Cross Section	0.05mm 30°	0.05mm 30°	0.1mm 25°	0.1mm 25°	0.2mm 25°	0.05mm 30°	0.3mm 25°
8	Not Available	0.05mm 30°	Not Available	0.1mm 23°	Not Available	Not Available	Double-Sided, 2 Corners
16							(*)

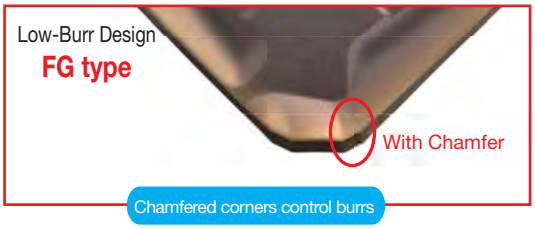
*Can only be used in conjunction with 8 corner inserts

■ Chipbreaker Selection Guide



● Improved machining quality

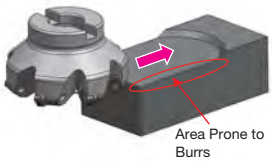
· FG type / FL type chipbreakers feature a chamfered corner to minimise burrs and provide excellent milling quality.



● FG type

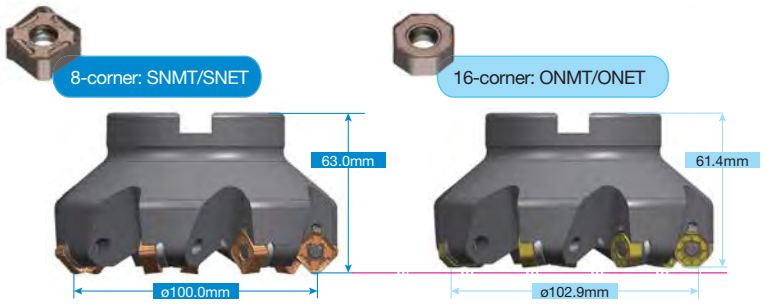
● Competitor's Product

FG type chipbreakers with low-burr design enable high-quality milling with few burrs and minimal edge chipping



Work Material: SCM435
Tool: ø100
Cutting Conditions: vc = 200m/min, fz = 0.2mm/t
ap = 3mm, ae = 85mm

Cutter Diameter and Cutting Edge Height

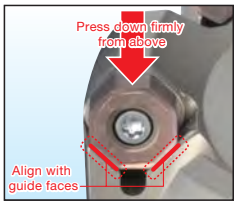


Note that while the 8-corner and 16-corner types can be used interchangeably on the same body, however they create different cutter diameters, cutting edge heights and maximum cutting depths.

Body Shape (Example: With Cutter Dia. of ø100mm)

Insert	Cutter Dia. DC (mm)	Cutting Edge Height LF (mm)	Max. Depth of Cut APMX (mm)
SNMT/SNET	100.0	63.0	6.0
ONMT/ONET	102.9	61.4	3.0

16-corner Mounting Method



Firmly align insert with guide faces, press down in the direction of the arrow, and tighten the screw to fix the insert.

Recommended Cutting Conditions (SNMT/SNET)

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.25**-0.40	< 4	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.30**-0.45	< 4	
	Die Steel	200 to 220 HB	100-**150**-200	0.15-**0.25**-0.35	< 4	
M	Stainless Steel	—	160-**200**-250	0.15-**0.23**-0.30	< 3	ACU2500 ACM300
K	Cast Iron	250HB	100-**200**-250	0.10-**0.25**-0.40	< 5	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non-Ferrous Metals	—	500-**750**-1,000	0.15-**0.23**-0.30	< 3	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	< 3	ACU2500 ACM200 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Recommended Cutting Conditions (ONMT/ONET)

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.30**-0.50	< 2	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.50**-0.50	< 2	
	Die Steel	200 to 220 HB	100-**150**-200	0.15-**0.25**-0.30	< 2	
M	Stainless Steel	—	160-**200**-250	0.15-**0.23**-0.30	< 2	ACU2500 ACM300
K	Cast Iron	250HB	100-**200**-250	0.10-**0.30**-0.50	< 2	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	< 2	ACU2500 ACM200 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

■ Precautions when Using Wiper Inserts with Holes

Fig 1

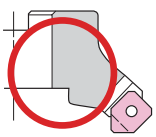
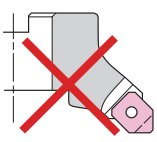


Fig 2



● When mounting the wiper insert, attach it as shown in Fig 1.
When mounted as shown in Fig 2, normal machined surface roughness cannot be obtained.
● The wiper insert has a single corner specification.
● Refer to page N17 of Technical Guidance for details about milling with wiper inserts.

DGC 13000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
Radial	-10°	
Axial	-5°	

6mm 45° (SNMT/SNET) | 3mm 45° (ONMT/ONET) | Face Milling

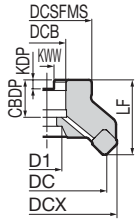
Fig 1


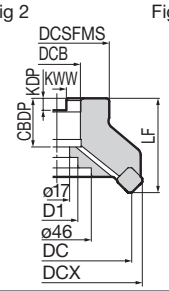
Fig 2


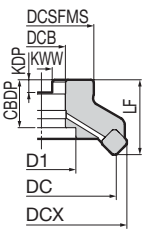
Fig 3


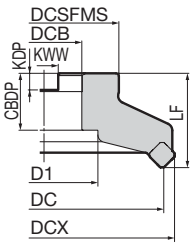
Fig 4


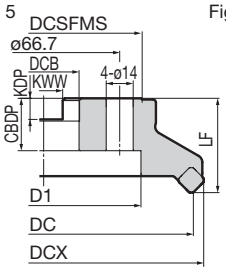
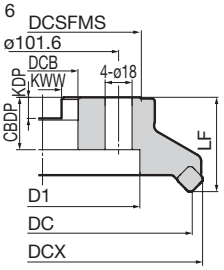
Fig 5


Fig 6


Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Weight (kg)	Fig
Metric	DGC 13040RS	●	40(42.9)	54(50.8)	36	40(38.44)	16	8.4	5.6	18	13.5	3	0.3	1
	13050RS	●	50(52.9)	64(60.8)	40	40(38.44)	22	10.4	6.3	20	18	3	0.4	1
	13063RS	●	63(65.9)	77(73.8)	50	40(38.44)	22	10.4	6.3	20	18	4	0.5	1
	13080RS	●	*80(82.9)	94(90.8)	60	50(48.44)	27	12.4	7	25	20	4	1.2	1
	13100RS	●	100(102.9)	114(110.8)	70	50(48.44)	32	14.4	8.5	32	46	5	1.6	3
	13125RS	●	125(127.9)	139(135.8)	80	63(61.44)	40	16.4	9.5	29	52	6	2.8	1
	13160RS	●	160(162.9)	174(170.8)	100	63(61.44)	40	16.4	9.5	29	88	7	4.5	5
	13200RS	●	200(202.9)	214(210.8)	130	63(61.44)	60	25.7	14	35	130	8	7.1	6
	13250RS	●	250(252.9)	264(260.8)	130	63(61.44)	60	25.7	14	35	160	10	11.2	6
Inch	DGC 13080R	●	*80(82.9)	94(90.8)	60	50(48.44)	25.4	9.5	6	25	20	4	1.2	1
	13100R	●	*100(102.9)	114(110.8)	70	63(61.44)	31.75	12.7	8	32.5	28	5	2.2	2
	13125R	●	125(127.9)	139(135.8)	80	63(61.44)	38.1	15.9	10	35.5	55	6	2.8	1
	13160R	●	160(162.9)	174(170.8)	100	63(61.44)	50.8	19.1	11	38	72	7	4.5	4
	13200R	●	200(202.9)	214(210.8)	130	63(61.44)	47.625	25.4	14	35	130	8	7.1	6
	13250R	●	250(252.9)	264(260.8)	130	63(61.44)	47.625	25.4	14	35	150	10	11.2	6

( ) indicates value for ONMT/ONET type inserts.
Inserts are sold separately. Sizes ø160mm and above do not have coolant holes.
Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide		DLC	Cermet	
Process	High-speed/Light Cutting	KS KM	PS PM	P			K	K		MS		KN		N	PM	
	Medium Cutting	KS KM	PS PM		PM	PM	K	K		MS	MS		KS	N	P	
	Roughing	KS			PM	PM			K		MS					
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	EH520	DL1000	T4500A	Fig
SNMT 13T6ANER-L		●	●	●	●	●	●	●	●			—		—	—	1
13T6ANER-G		●	●	●	●	●	●	●	●				●		●	1
13T6ANER-H		●	●	●	●	●	●	●	●			—		—	—	1
13T6ANER-FL		●	●	●	●	●	●	●	●			—		—	—	2
13T6ANER-FG		●	●	●	●	●	●	●	●			—		—	—	2
SNET 13T6ANER-L										●	●					1
13T6ANER-G										●	●					1
13T6ANER-FL										●	●					2
13T6ANER-FG										●	●					2
13T6ANFR-S												●		●		1
XNEU 13T6ANEN-W		●	●		●		●		●						●	3
ONMT 05T6ANER-L		●	●	●	●	●	●	●	●			—		—	—	4
05T6ANER-G		●	●	●	●	●	●	●	●			—		—	—	4
ONET 05T6ANER-L										●	●					4
05T6ANER-G										●	●					4

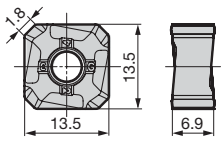
Fig 1


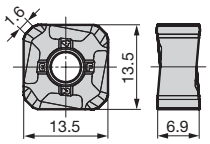
Fig 2


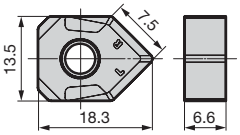
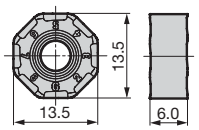
Fig 3 Wiper Insert


Fig 4


Wiper inserts can only be used in combination with 8-cornered inserts (SNMT/SNET).

The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance.
Refer to H31 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Recommended Cutting Conditions H31

Identification Code

DGC 13 040 R S

DGC	13	040	R	S
Series Code	Insert Size	Cutter Dia.	Feed Direction	Metric Bore

Parts (Sold Separately)

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seizure Cream	Flat Insert Screw (*)	
							Handle Grip	Bit			
DC ø40 to 125	DGCS13R	BW0609F	LH040	BFTX0412IP	N·m 3.0	—	HPS1015	TRB15IP	SUMI-P	BFTX0418IP	N·m 3.0
Other than above						TRDR15IP	—	—			

*Insert corners can be changed simply by loosening the screw. Only applies to ø80mm size DGC/DGCM types.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DGCM 13000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-10°
	Axial	-5°

6mm 45° (SNMT/SNET) | 3mm 45° (ONMT/ONET) | Face Milling

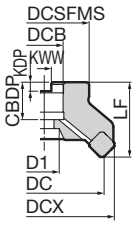
Fig 1


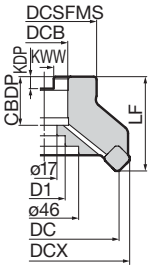
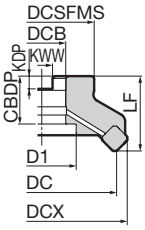
Fig 2


Fig 3


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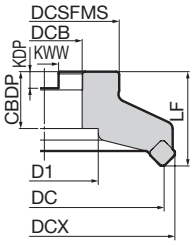
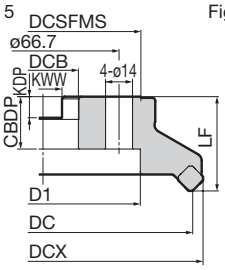


Fig 5


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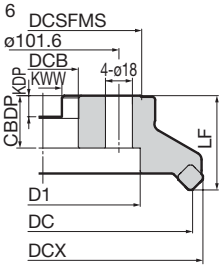


Body (Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Weight (kg)	Fig
Metric	**DGCM 13050RS**	●	**50(52.9)**	64(60.8)	40	40(38.44)	**22**	10.4	6.3	20	18	4	0.3	1
	13063RS	●	**63(65.9)**	77(73.8)	50	40(38.44)	**22**	10.4	6.3	20	18	5	0.5	1
	13080RS	●	***80(82.9)**	94(90.8)	60	50(48.44)	**27**	12.4	7	25	20	6	1.1	1
	13100RS	●	**100(102.9)**	114(110.8)	70	50(48.44)	**32**	14.4	8.5	32	46	7	1.5	3
	13125RS	●	**125(127.9)**	139(135.8)	80	63(61.44)	**40**	16.4	9.5	29	52	8	2.8	1
	13160RS	●	**160(162.9)**	174(170.8)	100	63(61.44)	**40**	16.4	9.5	29	88	10	4.6	5
	13200RS	●	**200(202.9)**	214(210.8)	130	63(61.44)	**60**	25.7	14	35	130	12	7	6
	13250RS	●	**250(252.9)**	264(260.8)	130	63(61.44)	**60**	25.7	14	35	160	14	11.1	6
Inch	**DGCM 13080R**	●	***80(82.9)**	94(90.8)	60	50(48.44)	**25.4**	9.5	6	25	20	6	1.1	1
	13100R	●	***100(102.9)**	114(110.8)	70	63(61.44)	**31.75**	12.7	8	32.5	28	7	2.2	2
	13125R	●	**125(127.9)**	139(135.8)	80	63(61.44)	**38.1**	15.9	10	35.5	55	8	2.8	1
	13160R	●	**160(162.9)**	174(170.8)	100	63(61.44)	**50.8**	19.1	11	38	72	10	4.6	4
	13200R	●	**200(202.9)**	214(210.8)	130	63(61.44)	**47.625**	25.4	14	35	130	12	7	6
	13250R	●	**250(252.9)**	264(260.8)	130	63(61.44)	**47.625**	25.4	14	35	150	14	11.1	6

( ) indicates value for ONMT/ONET type inserts. Inserts are sold separately. Sizes ø160mm and above do not have coolant holes.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide		DLC	Cermet	
Process	High-speed/Light Cutting	PS PM	PS PM	P			K	K		M S		K N		N	P M	
	Medium Cutting	PS PM	PS PM		P M	P M	K	K		M S			K S	N	P	
	Roughing	PS PM			P M	P M			K		M S					
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	EH520	DL1000	T4500A	Fig
SNMT 13T6ANER-L		●	●	●	●	●	●	●	●			—		—	—	1
13T6ANER-G		●	●	●	●	●	●	●	●				●		●	1
13T6ANER-H		●	●	●	●	●	●	●	●			—		—	—	1
13T6ANER-FL		●	●	●	●	●	●	●	●			—		—	—	2
13T6ANER-FG		●	●	●	●	●	●	●	●			—		—	—	2
SNET 13T6ANER-L										●	●					1
13T6ANER-G										●	●					1
13T6ANER-FL										●	●					2
13T6ANER-FG										●	●					2
13T6ANFR-S												●		●		1
XNEU 13T6ANEN-W		●	●		●		●		●						●	3
ONMT 05T6ANER-L		●	●	●	●	●	●	●	●			—		—	—	4
05T6ANER-G		●	●	●	●	●	●	●	●			—		—	—	4
ONET 05T6ANER-L										●	●					4
05T6ANER-G										●	●					4

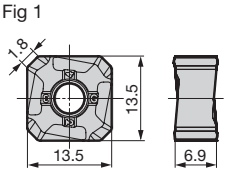
Fig 1


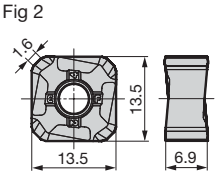
Fig 2


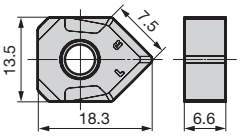
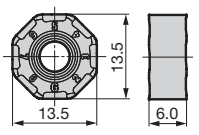
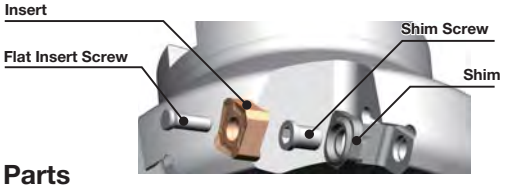
Fig 3 Wiper Insert


Fig 4


Wiper inserts can only be used in combination with 8-cornered inserts (SNMT/SNET).

The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance.
Refer to H31 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Recommended Cutting Conditions H31



Identification Code

DGC	M	13	050	R	S
Series Code	Fine Pitch	Insert Size	Cutter Dia.	Feed Direction	Metric Bore

Parts (Sold Separately)

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seizure Cream	Flat Insert Screw (*)	
							Handle Grip	Bit			
DC ø50 to 125	DGCS13R	BW0609F	LH040	BFTX0412IP	N·m 3.0	—	HPS1015	TRB15IP	SUMI-P	BFTX0418IP	N·m 3.0
Other than above						TRDR15IP	—	—			

*Insert corners can be changed simply by loosening the screw. Only applies to ø80mm size DGC/DGCM types.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DGCF 13000R(S) type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Rake Angle		
	Radial	-10°
	Axial	-5°

6mm 45° (SNMT/SNET) 3mm 45° (ONMT/ONET) Face Milling

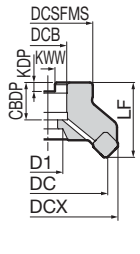
Fig 1


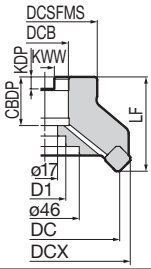
Fig 2


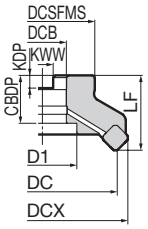
Fig 3


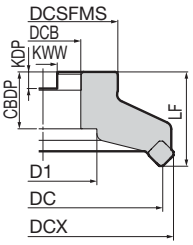
Fig 4


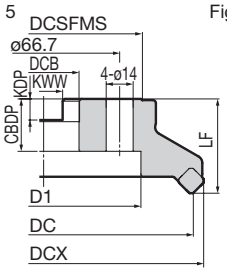
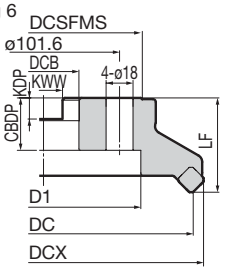
Fig 5


Fig 6


Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Weight (kg)	Fig
Metric	**DGCF 13050RS**	●	**50(52.9)**	64(60.8)	40	40(38.44)	**22**	10.4	6.3	20	18	5	0.3	1
	13063RS	●	**63(65.9)**	77(73.8)	50	40(38.44)	**22**	10.4	6.3	20	18	6	0.5	1
	13080RS	●	***80(82.9)**	94(90.8)	60	50(48.44)	**27**	12.4	7	25	20	8	1.1	1
	13100RS	●	**100(102.9)**	114(110.8)	70	50(48.44)	**32**	14.4	8.5	32	46	10	1.4	3
	13125RS	●	**125(127.9)**	139(135.8)	80	63(61.44)	**40**	16.4	9.5	29	52	12	2.7	1
	13160RS	●	**160(162.9)**	174(170.8)	100	63(61.44)	**40**	16.4	9.5	29	88	14	4.4	5
	13200RS	●	**200(202.9)**	214(210.8)	130	63(61.44)	**60**	25.7	14	35	130	16	6.9	6
	13250RS	●	**250(252.9)**	264(260.8)	130	63(61.44)	**60**	25.7	14	35	160	18	11	6
Inch	**DGCF 13080R**	●	***80(82.9)**	94(90.8)	60	50(48.44)	**25.4**	9.5	6	25	20	8	1.1	1
	13100R	●	***100(102.9)**	114(110.8)	70	63(61.44)	**31.75**	12.7	8	32.5	28	10	2.1	2
	13125R	●	**125(127.9)**	139(135.8)	80	63(61.44)	**38.1**	15.9	10	35.5	55	12	2.7	1
	13160R	●	**160(162.9)**	174(170.8)	100	63(61.44)	**50.8**	19.1	11	38	72	14	4.4	4
	13200R	●	**200(202.9)**	214(210.8)	130	63(61.44)	**47.625**	25.4	14	35	130	16	6.9	6
	13250R	●	**250(252.9)**	264(260.8)	130	63(61.44)	**47.625**	25.4	14	35	150	18	11	6

( ) indicates value for ONMT/ONET type inserts. Inserts are sold separately. Sizes ø160mm and above do not have coolant holes.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide		DLC	Cermet	
Process	High-speed/Light Cutting	K M S	P K M	P			K	K		M S		K N		N	P M	
	Medium Cutting	K M S	P K M		P M	P M	K	K		M S			K S	N	P	
	Roughing	K M S			P M	P M			K		M S					
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	EH520	DL1000	T4500A	Fig
SNMT 13T6ANER-L		●	●	●	●	●	●	●	●			—		—	—	1
13T6ANER-G		●	●	●	●	●	●	●	●				●		●	1
13T6ANER-H		●	●	●	●	●	●	●	●			—		—	—	1
13T6ANER-FL		●	●	●	●	●	●	●	●			—		—	—	2
13T6ANER-FG		●	●	●	●	●	●	●	●			—		—	—	2
SNET 13T6ANER-L										●	●					1
13T6ANER-G										●	●					1
13T6ANER-FL										●	●					2
13T6ANER-FG										●	●					2
13T6ANFR-S												●		●		1
XNEU 13T6ANEN-W		●	●		●		●		●						●	3
ONMT 05T6ANER-L		●	●	●	●	●	●	●	●			—		—	—	4
05T6ANER-G		●	●	●	●	●	●	●	●			—		—	—	4
ONET 05T6ANER-L										●	●					4
05T6ANER-G										●	●					4

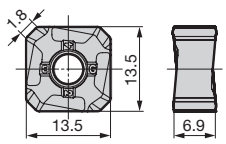
Fig 1


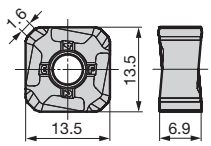
Fig 2


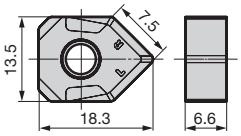
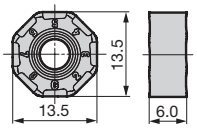
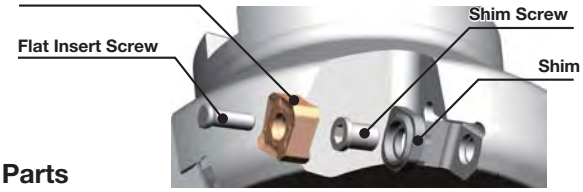
Fig 3 Wiper Insert


Fig 4


Wiper inserts can only be used in combination with 8-cornered inserts (SNMT/SNET).

The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance.
Refer to H31 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Recommended Cutting Conditions H31



Identification Code

DGC	F	13	050	R	S
Series Code	Extra Fine Pitch	Insert Size	Dia.	Feed Direction	Metric Bore

Parts (Sold Separately)

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Integrated Wrench	Detachable Wrench Handle Grip	Detachable Wrench Bit	Anti-seizure Cream	Flat Insert Screw (*)	
DC ø50 to 125	DGCS13R	BW0609F	LH040	BFTX0412IP	N·m 3.0	—	HPS1015	TRB15IP	SUMI-P	BFTX0418IP	N·m 3.0
Other than above						TRDR15IP	—	—			

*Insert corners can be changed simply by loosening the screw. Only applies to ø80mm size DGC/DGCM types.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

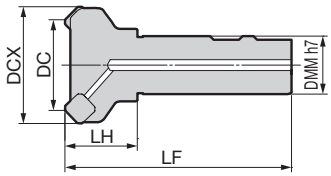
DGC 13000EW type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Rake Angle		
	Radial	-10°
	Axial	-5°

6mm 45° (SNMT/SNET) 3mm 45° (ONMT/ONET) Face Milling

Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
DGC 13040EW	●	**40(42.9)**	54(50.8)	32	40(38.44)	125	3	0.7	1
13050EW	●	**50(52.9)**	64(60.8)	32	40(38.44)	125	3	0.9	1
13063EW	●	**63(65.9)**	77(73.8)	32	40(38.44)	125	4	1.1	1

( ) indicates value for ONMT/ONET type inserts.
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide									Cemented Carbide		DLC	Cermet	
Process	High-speed/Light Cutting	PKMS	PKM	P			K	K		MS	KN		N	PM	
	Medium Cutting	PKMS	PKM		PM	PM	K	K		MS		KS	N	P	
	Roughing	PKMS			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	EH520	DL1000	T4500A	Fig
SNMT 13T6ANER-L		●	●	●	●	●	●	●	●			—		—	—	1
13T6ANER-G		●	●	●	●	●	●	●	●				●		●	1
13T6ANER-H		●	●	●	●	●	●	●	●			—		—	—	1
13T6ANER-FL		●	●	●	●	●	●	●	●			—		—	—	2
13T6ANER-FG		●	●	●	●	●	●	●	●			—		—	—	2
SNET 13T6ANER-L										●	●					1
13T6ANER-G										●	●					1
13T6ANER-FL										●	●					2
13T6ANER-FG										●	●					2
13T6ANFR-S												●		●		1
XNEU 13T6ANEN-W		●	●		●		●		●						●	3
ONMT 05T6ANER-L		●	●	●	●	●	●	●	●			—		—	—	4
05T6ANER-G		●	●	●	●	●	●	●	●			—		—	—	4
ONET 05T6ANER-L										●	●					4
05T6ANER-G										●	●					4

Fig 1

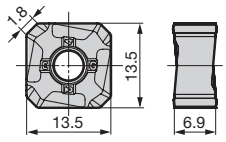


Fig 2

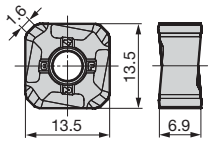


Fig 3 Wiper Insert

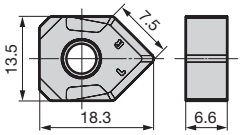
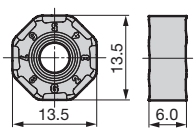


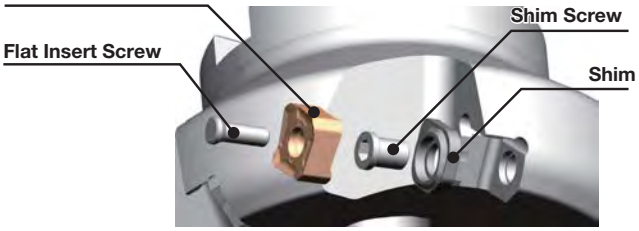
Fig 4



Wiper inserts can only be used in combination with 8-cornered inserts (SNMT/SNET).

The ACP100 and ACK200 may vary in colour or lustre, but these variations do not affect the performance.
Refer to H31 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Recommended Cutting Conditions H31



Identification Code

DGC Series Code — **13** Insert Size — **040** Dia. — **EW** Shank type

Parts

Shim	Shim Screw	Wrench	Flat Insert Screw		Wrench	Anti-seizure Cream
DGCS13R	BW0609F	LH040	BFTX0412IP	3.0	TRDR15IP	SUMI-P

UFO 4000 type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal

Rake Angle	Radial	-7°
	Axial	27°

5.5mm 45°

Face Milling

Fig 1

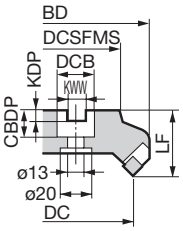


Fig 2

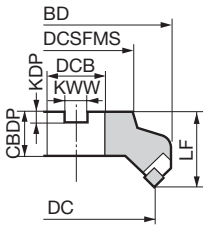


Fig 3

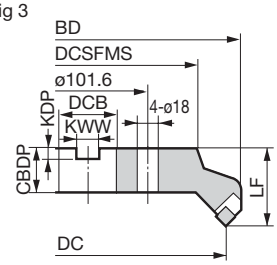


Fig 4

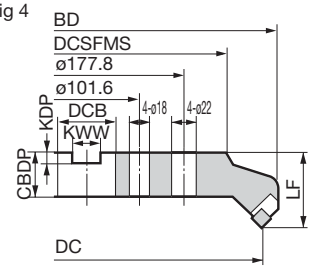


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**UFO 4080R/L**	●		***80**	102	60	50	**25.4**	9.5	6	25	4	2.1	1
	4100R/L	●		**100**	122	70	50	**31.75**	12.7	8	32	5	2.9	2
	4125R/L	●		**125**	146	75	63	**38.1**	15.9	10	38	6	4.2	2
	4160R/L	●		**160**	180	100	63	**50.8**	19.1	11	38	8	6.6	2
	4200R/L	●		**200**	220	130	63	**47.625**	25.4	14	35	10	9.5	3
	4250R/L	●		**250**	270	130	63	**47.625**	25.4	14	35	12	14.8	3
	4315R/L			**315**	335	240	80	**47.625**	25.4	14	35	14	26.6	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide				Cermet	
Process	High-speed/Light Cutting	P			K		M			K N			
	General-purpose		P M	P M	K			P	K		K	P	
	Roughing		P M	P M		K							
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E	H1	H10E	T250A	Fig
SFEN 12T3AZTN		●	●					●				●	1
12T3AZTN-S								●					1
12T3AZTN-W													1
12T3AZFN										●			1
SFKN 12T3AZTN		●	●	●				●				●	2(3)
12T3AZTN-S								●					3
12T3AZTN-W												●	3
12T3AZFN					●	●	●		●				2(3)
SFKR 12T3AZEN		●						●					4
UW 12500R											●		5

-S: Sharp Edged, -W: Strong Edged.

Fig 1

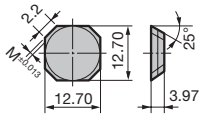


Fig 2 (Grades in ACP/ACK series)

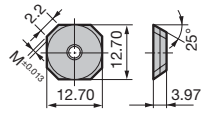


Fig 3

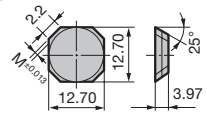


Fig 4

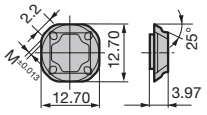
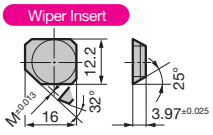
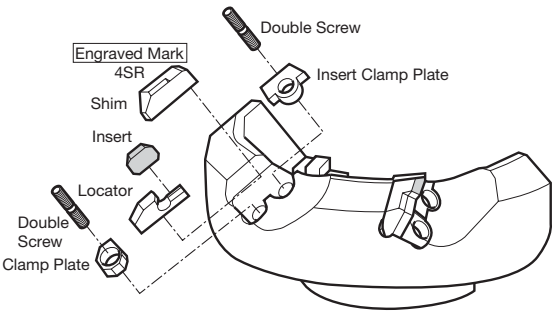


Fig 5 Wiper Insert





Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	100-**175**-250	0.15-**0.23**-0.30	ACP200
P	Mild Steel	≤ 180HB	125-**210**-300	0.15-**0.23**-0.30	ACP200
P	Die Steel	200 to 220HB	80-**140**-200	0.15-**0.20**-0.25	ACP200
M	Stainless Steel	—	160-**190**-220	0.15-**0.23**-0.30	ACP300
K	Cast Iron	250HB	60-**155**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	300-**550**-800	0.15-**0.23**-0.30	H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Shim	Locator	Locator Clamp	Insert Clamp Plate	Double Screw		
						Size	N·m
UFO 4000R type	UF4SR	UF4KR	UFKWR	UFTWR	WB7-15T	**M7**	**8.0**
UFO 4000L type	UF4SL	UF4KL	UFKWL	UFTWL	WB7-15T	**M7**	**8.0**

T-wrench (TT25) is included as a standard accessory.

N·m Recommended Tightening Torque (N·m)

UFO 5000 type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal

Rake Angle		
Rake	Radial	-7°
Angle	Axial	27°

7.5mm 45°

Face Milling

Fig 1

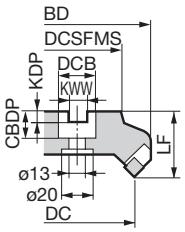


Fig 2

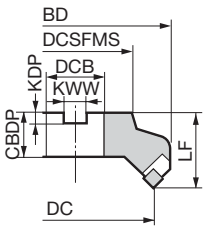


Fig 3

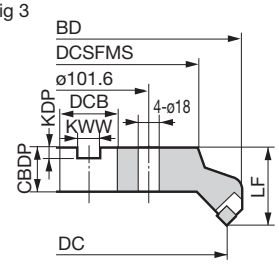


Fig 4

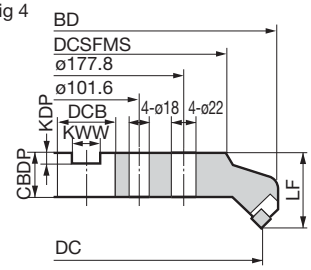


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**UFO 5080R/L**			***80**	102	60	50	**25.4**	9.5	6	25	4	2.0	1
	5100R/L	●		**100**	119	70	50	**31.75**	12.7	8	32	5	2.8	2
	5125R/L	●		**125**	143	75	63	**38.1**	15.9	10	38	6	4.0	2
	5160R/L	●		**160**	177	100	63	**50.8**	19.1	11	38	8	6.4	2
	5200R/L	●		**200**	217	130	63	**47.625**	25.4	14	35	10	9.2	3
	5250R/L			**250**	267	130	63	**47.625**	25.4	14	35	12	14.4	3
	5315R/L			**315**	332	240	80	**47.625**	25.4	14	35	14	26.1	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide				Cermet	
Process	High-speed/Light Cutting	P			K		M			K/N			
	General-purpose		P/M	P/M	K			P	K		K	P	
	Roughing		P/M	P/M		K							
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E	H1	H10E	T250A	Fig
SFEN 1504AZTN		●	●					●				●	1
1504AZTN-S													1
1504AZTN-W													1
1504AZFN													1
SFKN 1504AZTN		●	●	●				●				●	2(3)
1504AZTN-S													3
1504AZTN-W													3
1504AZFN					●		●		●				2(3)
UW 15500R											●		4

-S: Sharp Edged, -W: Strong Edged.

Fig 1

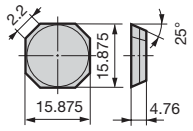


Fig 2 (Grades in ACP/ACK series)

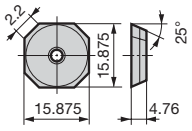


Fig 3

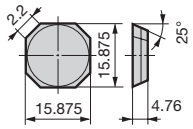
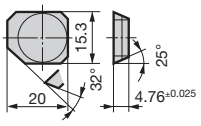
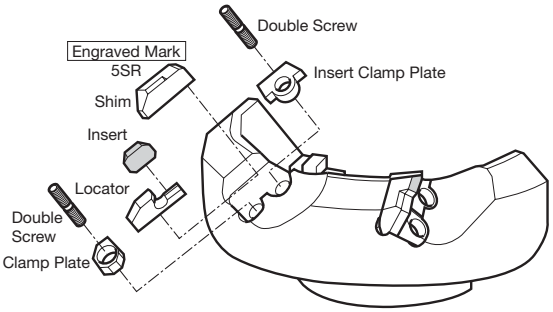


Fig 4 Wiper Insert





Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	100-**175**-250	0.15-**0.23**-0.30	ACP200
P	Mild Steel	≤ 180HB	125-**210**-300	0.15-**0.23**-0.30	ACP200
P	Die Steel	200 to 220HB	80-**140**-200	0.15-**0.20**-0.25	ACP200
M	Stainless Steel	—	160-**190**-220	0.15-**0.23**-0.30	ACP300
K	Cast Iron	250HB	60-**155**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	300-**550**-800	0.15-**0.23**-0.30	H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Shim	Locator	Locator Clamp	Insert Clamp Plate	Double Screw	Size	N·m
UFO 5000R type	UF5SR	UF5KR	UFKWR	UFTWR	WB7-15T	**M7**	**8.0**
UFO 5000L type	UF5SL	UF5KL	UFKWL	UFTWL	WB7-15T	**M7**	**8.0**

T-wrench (TT25) is included as a standard accessory.

UFO 4000E type

P Steel K Cast Iron N Non-Ferrous Metal

Rake Angle	Radial	-7°
	Axial	27°

5.5mm 45° Face Milling

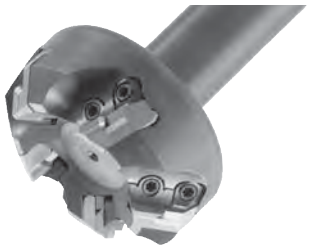
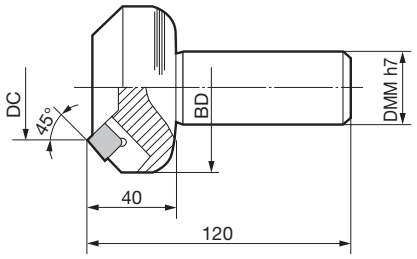


Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	External Dia. BD	Shank DMM	Number of Teeth	Maximum Depth of Cut	Axial Rake	Radial Rake	Fig
UFO 4050ER	●	**50**	74	32	4	5.5	+27°	-7°	1
4050ERS42		**50**	74	42	4				1
4063ER	●	**63**	86	32	5				1
4063ERS42		**63**	86	42	5				1
4080ER	●	**80**	102	32	6				1
4080ERS42		**80**	102	42	6				1
4100ER		**100**	123	32	7				1
4100ERS42		**100**	123	42	7				1

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide				Cermet	
Process	High-speed/Light Cutting	P			K		M			K N			
	General-purpose		P M	P M	K			P	K		K	P	
	Roughing		P M	P M		K							
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E	H1	H10E	T250A	Fig
SFEN 12T3AZTN		●	●					●				●	1
12T3AZTN-S								●					1
12T3AZTN-W													1
12T3AZFN										●			1
SFKN 12T3AZTN		●	●	●				●				●	2(3)
12T3AZTN-S								●					3
12T3AZTN-W												●	3
12T3AZFN					●	●	●		●				2(3)
SFKR 12T3AZEN		●						●					4
UW 12500R											●		5

Fig 1

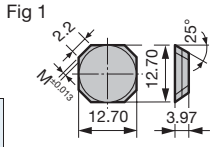


Fig 2 (For ACP/ACK series)

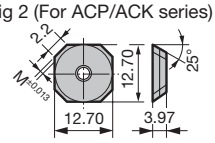


Fig 3

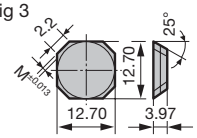


Fig 4

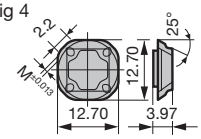
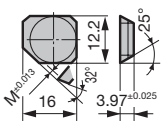
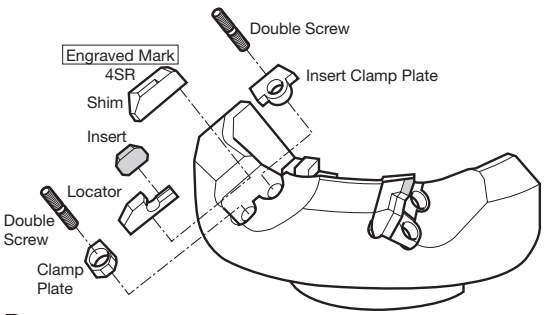


Fig 5



Wiper Insert



Parts

Shim	Locator	Locator Clamp Plate	Insert Clamp Plate	Double Screw			Wrench
					Size	N·m	
UF4SR	UF4KR	UFKWR	UFTWR	WB7-15T	**M7**	**8.0**	TT25

T-wrench (TT25) is included as a standard accessory.

Recommended Cutting Conditions

Diameter ø50 to ø63mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	100-**125**-200	0.10-**0.20**-0.30	ACP200
	Alloy Steel	180 to 280HB	80-**100**-180	0.10-**0.20**-0.30	ACP200
K	Cast Iron	250HB	80-**100**-120	0.10-**0.20**-0.30	ACK200
N	Non-Ferrous Metals	—	80-**160**-250	0.05-**0.15**-0.20	H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Diameter ø80 to ø100mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	100-**125**-200	0.10-**0.25**-0.40	ACP200
	Alloy Steel	180 to 280HB	80-**100**-180	0.10-**0.25**-0.40	ACP200
K	Cast Iron	250HB	80-**100**-120	0.10-**0.25**-0.40	ACK200
N	Non-Ferrous Metals	—	80-**160**-250	0.05-**0.25**-0.30	H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

GRC 6000 type

P Steel M Stainless Steel S Exotic Alloy

Rake Angle	Radial	10°
	Axial	25°

10mm

Face Milling

Fig 1

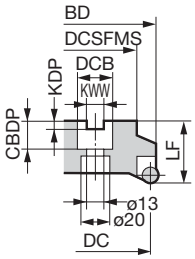


Fig 2

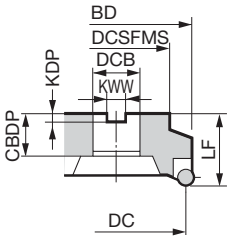


Fig 3

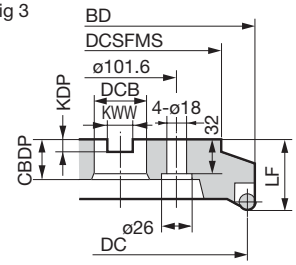


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**GRC 6080R/L**	▲		***80**	101	60	50	**25.4**	9.5	6	25	4	2.3	1
	6100R/L	▲		**100**	119	70	50	**31.75**	12.7	8	32	5	2.9	2
	6125R/L	▲		**125**	143	80	63	**38.1**	15.9	10	38	6	5.1	2
	6160R/L	▲		**160**	177	100	63	**50.8**	19.1	11	38	8	7.5	2
	6200R/L			**200**	218	130	63	**47.625**	25.4	13.5	38	10	11.0	3
	6250R/L			**250**	268	180	63	**47.625**	25.4	13.5	38	12	16.3	3

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

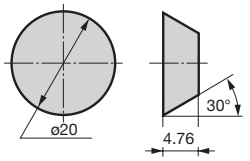
Insert

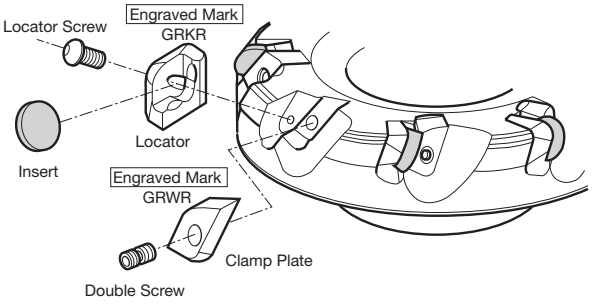
Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide	
Process	High-speed/Light Cutting	P			K		M		
	General-purpose		P M	P M	K			P	
	Roughing		P M	P M		K			
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	Fig
RGEN 2004SN-S			▲	▲				▲	1
2004SN-I							▲		1
2004SN-T							▲		1

-S: For Stainless Steel, -I: For Inconel, -T: For Titanium Alloys.

Fig 1





Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Die Steel	200 to 220HB	80-**120**-160	0.15-**0.23**-0.30	ACP200
M	Stainless Steel	—	120-**150**-180	0.15-**0.23**-0.30	ACP200
S	Inconel	—	40- **45** -50	0.10-**0.15**-0.20	EH20Z
	Titanium Alloy	—	40- **60** -80	0.10-**0.15**-0.20	EH20Z

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Locator	Locator Screw	Size	N·m	Clamp Plate	Double Screw	Size	N·m	Wrench
GRC 6080R to GRC 6250R	GRKR	BH0410T	**M4**	3.0	GRWR	WB8-22T	**M8**	8.0	TT27
GRC 6080L to GRC 6250L	GRKL	BH0410T	**M4**	3.0	GRWL	WB8-22T	**M8**	8.0	TT27

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

FPG 4000/5000 type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal

Rake Angle		
Radial	-4°	
Axial	15°	

6.5mm 45° (4000 type) 8.5mm 45° (5000 type) Face Milling

Fig 1

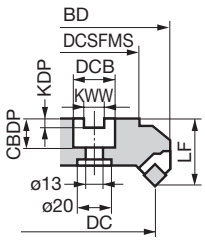


Fig 2

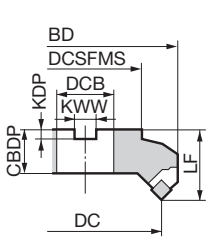


Fig 3

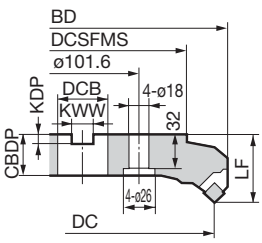


Fig 4

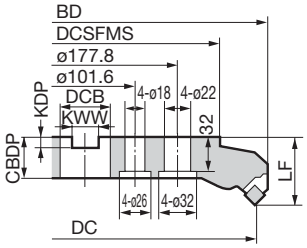


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**FPG 4080R/L**	●	●	*80	104	60	50	**25.4**	9.5	6	25	4	1.9	1
	4100R/L	●		**100**	124	70	60	**31.75**	12.7	8	32	5	3.0	2
	4125R/L	●	●	**125**	148	105	60	**38.1**	15.9	10	38	6	4.5	2
	4160R/L	●	●	**160**	182	135	60	**50.8**	19.1	11	38	8	6.7	2
	4200R/L	●		**200**	221	130	60	**47.625**	25.4	13.5	40	10	9.4	3
	4250R/L	●		**250**	271	130	70	**47.625**	25.4	13.5	40	12	16.2	3
	4315R/L	●		**315**	335	240	70	**47.625**	25.4	13.5	40	14	24.6	4
	FPG 5080R/L			*80	104	60	50	**25.4**	9.5	6	25	4	1.9	1
	5100R/L			**100**	124	70	60	**31.75**	12.7	8	32	5	3.0	2
	5125R/L			**125**	148	105	60	**38.1**	15.9	10	38	6	4.5	2
	5160R/L			**160**	182	135	60	**50.8**	19.1	11	38	8	6.7	2
	5200R/L			**200**	221	130	60	**47.625**	25.4	13.5	40	10	9.4	3
	5250R/L			**250**	271	130	70	**47.625**	25.4	13.5	40	12	16.2	3
	5315R/L			**315**	335	240	70	**47.625**	25.4	13.5	40	14	24.6	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

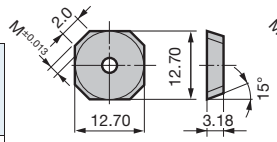
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide		Cermet		SUMIDIA		
Process	High-speed/Light Cutting	P			K		M			P		N	N	
	General-purpose		PM	PM	K			P	K		P	N	N	
	Roughing		PM	PM		K						N	N	
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E	T1500A	T250A	DA1000	DA2200	Fig
SDEX 42MT								●		●	●	—	—	2
SDKN 42M					●	●	●		●			—	—	1(2)
NF-SDKN 42M		—	—	—	—	—	—	—	—		—	●	▲	2
SDKN 42MT		●	●	●				●		●	●	—	—	1(2)
42MT-W											●	—	—	2
SDNN 1203AETN*		●	●	—	—	—	—	●	—	—	●	—	—	2
SDMR 1203AEEN		●	●					●			—	—	—	3
1203AETN		—	—	—	—	—	—	—	—	—	●	—	—	3
SDEX 53MT								●			●	—	—	5
SDKN 53M					●	●	●		●			—	—	4(5)
53MT		●	●	●				●			●	—	—	4(5)

Fig 1 (Grades in ACP/ACK series) Fig 2



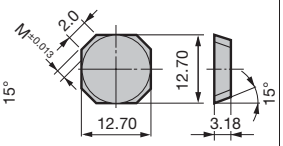


Fig 3

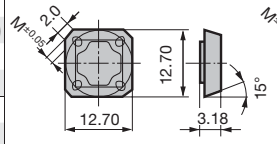


Fig 4 (Grades in ACP/ACK series)

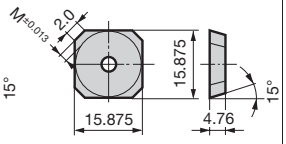
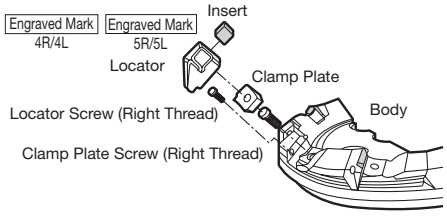


Fig 5: Same as Fig 4 without hole

Cat. No. marked *: M ±0.08.

Insert Application Table

Body	Insert
FPG4000 type	SD○○42·· SD○○12··
FPG5000 type	SD○○53··



Parts

Applicable Cutter	Locator	Locator Screw	Size	N·m	Clamp Plate	Clamp Plate Screw
FPG4000R type	LFP4R	FBH0512	M5	5.0	FPWR	FBX0817
FPG4000L type	LFP4L				FPWL	
FPG5000R type	LFP5R				FPWR	
FPG5000L type	LFP5L				FPWL	

T-wrenches used are TH030 (locator screw) and TH040 (clamp plate screw).

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	100-**130**-160	0.15-**0.28**-0.40	ACP200
P	Mild Steel	≤ 180HB	125-**210**-300	0.15-**0.28**-0.40	ACP200
P	Die Steel	200 to 220HB	80-**100**-120	0.15-**0.23**-0.30	ACP200
M	Stainless Steel	—	150-**175**-200	0.15-**0.23**-0.30	ACP300
K	Cast Iron	250HB	60-**155**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	300-**650**-1,000	0.15-**0.23**-0.30	G10E

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

FPE 4000 type

P Steel K Cast Iron

Rake Angle		
Rake	Radial	-3°
Angle	Axial	15°

6.5mm 45°

Face Milling

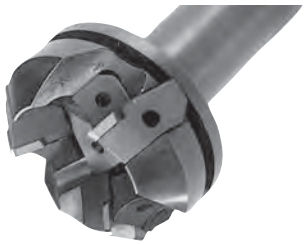
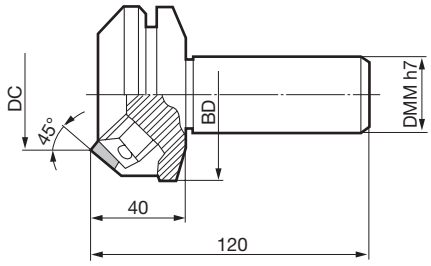


Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	External Dia. BD	Shank DMM	Number of Teeth	Maximum Depth of Cut	Axial Rake	Radial Rake	Fig
FPE 4050R	●	**50**	73	32	3	6.5	+15°	-3°	1
4050RS42		**50**	73	42	3				1
4063R	●	**63**	84	32	4				1
4063RS42		**63**	84	42	4				1
4080R	●	**80**	100	32	4				1
4080RS42		**80**	100	42	4				1
4100R		**100**	118	32	5				1
4100RS42		**100**	118	42	5				1

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide		Cermet		SUMIDIA		
Process	High-speed/Light Cutting	P			K		M			P		N	N	
	General-purpose		P M	P M	K			P	K		P	N	N	
	Roughing		P M	P M		K						N	N	
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E	T1500A	T250A	DA1000	DA2200	Fig
SDEX 42MT								●		●	●	—	—	2
SDKN 42M					●	●	●		●			—	—	1(2)
NF-SDKN 42M		—	—	—	—	—	—	—	—		—	●	▲	2
SDKN 42MT		●	●	●				●		●	●	—	—	1(2)
42MT-W											●	—	—	2
SDNN 1203AETN*		●	●	—	—	—	—	●	—	—	●	—	—	2
SDMR 1203AEEN		●	●					●			—	—	—	3
1203AETN		—	—	—	—	—	—	—	—	—	●	—	—	3

Fig 1 (Grades in ACP/ACK series) Fig 2

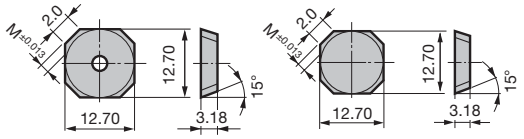
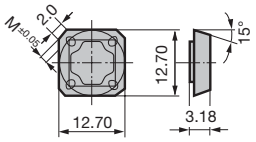


Fig 3



Cat. No. marked *: M ±0.08.

Parts

Locator	Locator Screw	Clamp Plate	Clamp Plate Screw			Wrench
				Size	N·m	
LFE4R	FBH0512	FEWR	FBX0817	**M8**	**8.0**	TH040

Recommended Cutting Conditions

Diameter ø50 to ø63mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	100-**125**-150	0.10-**0.20**-0.30	ACP200
P	Alloy Steel	180 to 280HB	80-**100**-120	0.10-**0.20**-0.30	ACP200
K	Cast Iron	250HB	80-**100**-120	0.10-**0.20**-0.30	ACK300

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Diameter ø80 to ø100mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	100-**125**-150	0.10-**0.25**-0.40	ACP200
P	Alloy Steel	180 to 280HB	80-**100**-120	0.10-**0.25**-0.40	ACP200
K	Cast Iron	250HB	80-**100**-120	0.10-**0.25**-0.40	ACK300

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

EHG 4000/5000 type

P Steel M Stainless Steel K Cast Iron

Rake Angle		
Radial	-3°	
Axial	20°	

5.5mm 45° (4000 type) 7.5mm 45° (5000 type) Face Milling

Fig 1

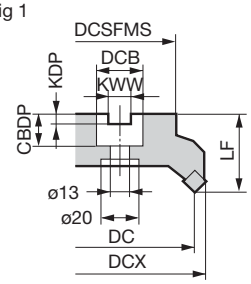


Fig 2

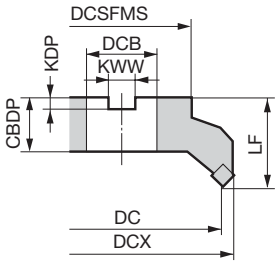
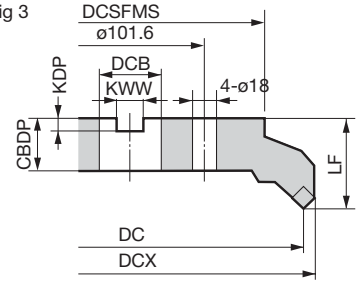


Fig 3



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**EHG 4080R**	●	**80**	95	60	50	**25.4**	9.5	6	25	4	1.3	1
	4100R	●	**100**	114	70	50	**31.75**	12.7	8	32	5	2.0	2
	4125R	●	**125**	138	75	63	**38.1**	15.9	10	38	6	3.3	2
	4160R	●	**160**	173	100	63	**50.8**	19.1	11	38	8	4.8	2
	4200R	●	**200**	213	130	63	**47.625**	25.4	13.5	35	10	7.1	3
	EHG 5080R		**80**	100	60	50	**25.4**	9.5	6	25	4	1.5	1
	5100R		**100**	118	70	50	**31.75**	12.7	8	32	5	2.2	2
	5125R		**125**	143	75	63	**38.1**	15.9	10	38	6	3.6	2
	5160R		**160**	178	100	63	**50.8**	19.1	11	38	8	5.2	2
	5200R		**200**	218	130	63	**47.625**	25.4	13.5	35	10	7.6	3

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide		Cermet			
Process	High-speed/Light Cutting	P			K		M						
	General-purpose		P M	P M	K			P	K	P			
	Roughing		P M	P M		K							
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E	T250A	Inscribed Circle IC	Thickness S	Fig
SECN 42MT								●		●	12.70	3.18	1
42M											12.70	3.18	1
SEEN 42MT		●	●	●							12.70	3.18	3*
SEKN 42MT		●	●	●				●		●	12.70	3.18	2(3)
42MT-W										●	12.70	3.18	3
42M					●	●	●		●		12.70	3.18	2(3)
SENN 1203AFTN*		●	—	—	—	—	—	●	—	●	12.70	3.18	3
SEMR 1203AFEN		●	—	—	—	—	—	●	—	—	12.70	3.18	4
SEER 1203AFEN**		●	—	—	—	—	—	●	—	—	12.70	3.18	4
SECN 53MT											15.875	4.76	1
53M											15.875	4.76	1
SEKN 53MT		●	●	●				●		●	15.875	4.76	3
53M					●	●					15.875	4.76	3

Fig 1

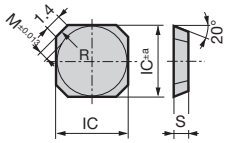


Fig 2 (Grades in ACP/ACK series)

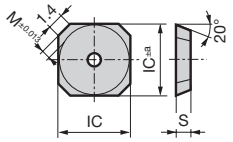


Fig 3

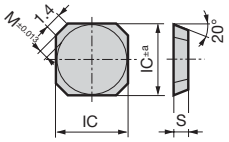
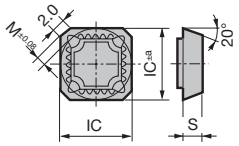


Fig 4



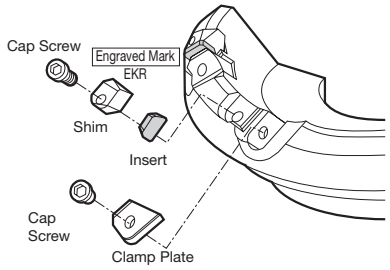
Cat. No. marked *: M ±0.08 Chamfer 1.4 → 2.0.

Cat. No. marked **: M ±0.025 Chamfer 2.0 → 2.2.

The shape of *-marked E class inserts differs slightly from the above figures.

Insert Application Table

Body	Insert
EHG4000 type	SE○N42·· SE○○12··
EHG5000 type	SE○N53··



Parts

Applicable Cutter	Shim	Clamp Plate	Cap Screw	Size	N·m	Wrench
EHG4000R type	EHK4R	EHW4R	EHBX0512	**M5**	5.0	TH040
EHG5000R type	EHK5R	EHW5R		**M5**		

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	160-**205**-250	0.10-**0.15**-0.20	ACP200
P	Mild Steel	≤ 180HB	160-**230**-300	0.10-**0.18**-0.25	ACP200
P	Die Steel	200 to 220HB	80-**100**-120	0.10-**0.18**-0.25	ACP200
M	Stainless Steel	—	160-**180**-200	0.10-**0.20**-0.30	ACP300
K	Cast Iron	250HB	80-**100**-120	0.10-**0.20**-0.30	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

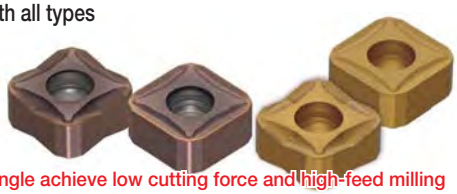
MEMO

DNX(F) series/DNH series/DNHS series

High-efficiency Face Milling Cutters for Cast Iron and Cast Steel

■ Features

- Achieves high-efficiency milling with a max. 8mm depth of cut
- Employs negative inserts with chipbreakers that have a strong cutting edge on the double negative type body. Economical design using 8 corners
- Supports general to high-efficiency high-feed milling with three body types. Same inserts can be used with all types

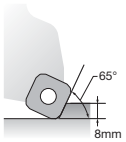


Negative inserts with a rake angle achieve low cutting force and high-feed milling

■ Product Range

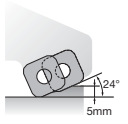
DNX(F) type — General-purpose type

Max. Depth of Cut		8mm
Cutting Edge Angle		65°
Dia.	DNX 12000R(S) Standard Pitch	ø80 to ø250mm
	DNXF 12000R(S) Extra Fine Pitch	ø80 to ø160mm



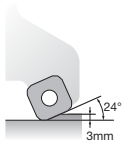
DNHS type — Medium Depth of Cut High Feed type

Max. Depth of Cut		5mm
Cutting Edge Angle		24°
Dia.	DNHS 12000R Medium Depth of Cut High Feed type	ø80 to ø160mm



DNH type — Small Depth of Cut High Feed type

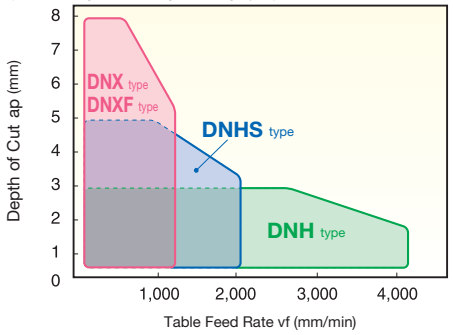
Max. Depth of Cut		3mm
Cutting Edge Angle		24°
Dia.	DNH 12000R Small Depth of Cut High Feed type	ø80 to ø160mm



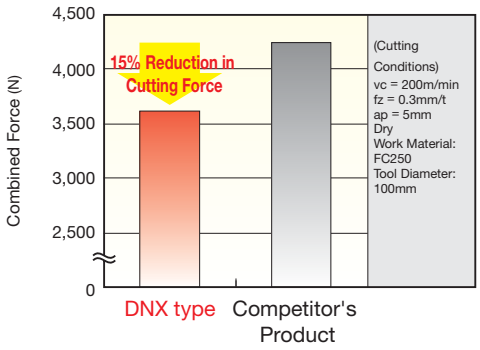
Large ◀ Depth of Cut — Feed Rate ▶ Large

■ Usage Region (Cutting Cast Iron) Cut carbon steel at 20 to 30% reduction.

* The following conditions are provided as a general guide. Actual conditions will need to be adjusted according to tool overhang, machine rigidity, depth of cut and other factors.



■ Comparison of Cutting Force



■ Recommended Cutting Conditions

DNX type / DNXF type

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Cast Iron	250HB	150-**225**-300	0.10-**0.20**-0.30	ACK200 ACK300
K	Ductile Cast Iron	250HB	150-**200**-250	0.10-**0.18**-0.25	ACK200 ACK300
P	Carbon Steel	180 to 280HB	150-**175**-200	0.10-**0.15**-0.20	ACP200
P	Alloy Steel	180 to 280HB	150-**175**-200	0.10-**0.15**-0.20	ACP200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

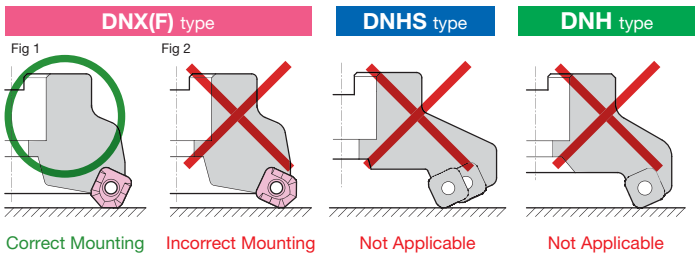
DNHS type/DNH type

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Cast Iron	250HB	150-**225**-300	0.10-**0.55**-1.00	ACK200 ACK300
K	Ductile Cast Iron	250HB	150-**200**-250	0.10-**0.55**-1.00	ACK200 ACK300
P	Carbon Steel	180 to 280HB	150-**175**-200	0.10-**0.45**-0.80	ACP200
P	Alloy Steel	180 to 280HB	150-**175**-200	0.10-**0.35**-0.60	ACP200

Note For DNHS type, insert heights are alternatively placed, so the actual feed rate per tooth is double. fz = 0. 5mm/t (actual feed rate 1.0mm/t) as the upper limit.
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

■ Precautions when Using Wiper Inserts with Holes

- When mounting the wiper insert, attach it as shown in Fig 1.
  When mounted as shown in Fig 2, normal machined surface roughness cannot be obtained.
- Wiper inserts are single-cornered and double-sided.
- Refer to Technical Guidance page N17 in the General Catalogue for details about wiper inserts.
- Do not use with DNHS and DNH types.



DNX(F)12000 type

P Steel K Cast Iron

Rake Angle		
Rake	Radial	-6°
Angle	Axial	-5°

8mm / 65°

Face Milling

Fig 1

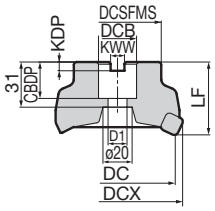


Fig 2

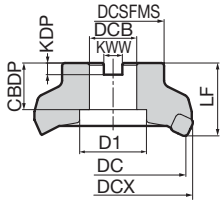
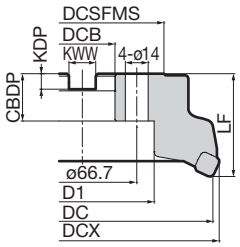


Fig 3



Body (Standard Pitch) Cutting Edge Angle 65°

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Effective No. of Teeth	Weight (kg)	Fig
Metric	**DNX 12080RS**	●	***80**	88	60	50	**27**	12.4	7	25	13.5	6	6	1.2	1
	12100RS	●	**100**	108	80	50	**32**	14.4	8.5	29	46	7	7	1.6	2
	12125RS	●	**125**	133	80	63	**40**	16.4	9.5	29	56	8	8	2.8	2
	12160RS	●	**160**	168	100	63	**40**	16.4	9.5	29	88	10	10	4.4	3
Inch	**DNX 12080R**	●	***80**	88	60	50	**25.4**	9.5	6	25	13	6	6	1.2	1
	12100R	●	**100**	108	70	50	**31.75**	12.7	8	32	46	7	7	1.6	2
	12125R	●	**125**	133	80	63	**38.1**	15.9	10	38	56	8	8	2.8	2
	12160R	●	**160**	168	100	63	**50.8**	19.1	11	38	72	10	10	4.4	2

Body (Extra Fine Pitch) Cutting Edge Angle 65°

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Effective No. of Teeth	Weight (kg)	Fig
Metric	**DNXF 12080RS**	●	***80**	88	60	50	**27**	12.4	7	25	13.5	8	8	1.2	1
	12100RS	●	**100**	108	80	50	**32**	14.4	8.5	29	46	10	10	1.6	2
	12125RS	●	**125**	133	80	63	**40**	16.4	9.5	29	56	11	11	2.7	2
	12160RS	●	**160**	168	100	63	**40**	16.4	9.5	29	88	12	12	4.4	3
Inch	**DNXF 12080R**	●	***80**	88	60	50	**25.4**	9.5	6	25	13	8	8	1.2	1
	12100R	●	**100**	108	70	50	**31.75**	12.7	8	32	46	10	10	1.6	2
	12125R	●	**125**	133	80	63	**38.1**	15.9	10	38	56	11	11	2.7	2
	12160R	●	**160**	168	100	63	**50.8**	19.1	11	38	72	12	12	4.4	2

Cutters with sizes of 200mm or above come with locators. Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

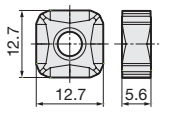
Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	K	K			
	General-purpose	K	K		PM	PM
	Roughing			K	PM	PM

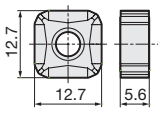
Cat. No.	ACK100	ACK200	ACK300	ACP200	ACP300	Cutting edge Shape	Applications	Fig
SNMT 1205ZNEN-L		●	●	●		V-shaped Edge type	Light Cutting	1
1205ZNEN-G	●	●	●	●			General-purpose	1
1205ZNEN-H	●	●	●	●			Heavy Cutting	1
SNMT 1205ZNEN-SH	●	●	●	●	●	Straight Edge type	Improved Chip Control	2
XNGT 1205ZNEN-W		●	●			Wiper Insert	Improved Surface Roughness	3

Fig 1



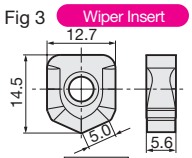
L type/G type/H type

Fig 2



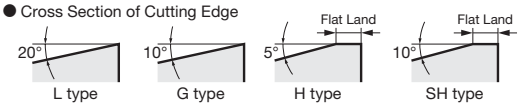
SH type

Fig 3 Wiper Insert



W type

● Cross Section of Cutting Edge



Refer to H44 "Precautions when Using Wiper Inserts With Holes" (Mounting Precautions).

Recommended Cutting Conditions H44

Identification Code

DNX F 12 080 R S

DNX	F	12	080	R	S
Series Code	Extra Fine Pitch	Insert Size	Dia.	Feed Direction	Metric Bore

Parts

Cat. No.	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seizure Cream
				Handle Grip	Bit	
		N·m				
DNX(F) 12080R(S) to DNX(F) 12100R(S)	BFTX0412IP	**3.0**	—	HPS1015	TRB15IP	SUMI-P
DNX(F) 12125R(S) to DNX(F) 12160R(S)			TRDR15IP	—	—	SUMI-P

N·m Recommended Tightening Torque (N·m)

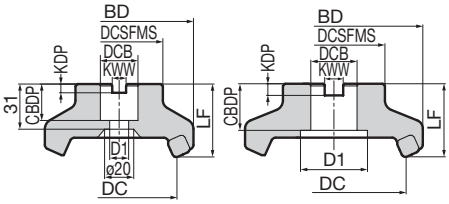
DNH(S)12000 type

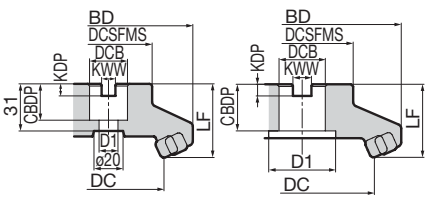
P Steel K Cast Iron

Rake Angle		
	Radial	-6°
	Axial	-5°

3mm 24° (DNH type) 5mm 24° (DNHS type) Face Milling

Fig 1 Fig 2 Fig 3 Fig 4





Body Cutting Edge Angle 24° Small Depth of Cut High Feed type

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Effective No. of Teeth	Weight (kg)	Fig
Inch	**DNH 12080R**	●	**80**	104	60	50	**25.4**	9.5	6	25	13	6	6	1.5	1
	12100R	●	**100**	124	70	50	**31.75**	12.7	8	32	46	7	7	1.9	2
	12125R	●	**125**	149	80	63	**38.1**	15.9	10	38	56	8	8	3.2	2
	12160R	●	**160**	184	100	63	**50.8**	19.1	11	38	72	10	10	5.1	2

Body Cutting Edge Angle 24° Medium Depth of Cut High Feed type

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Effective No. of Teeth	Weight (kg)	Fig
Inch	**DNHS 12080R**	●	**80**	116	60	50	**25.4**	9.5	6	25	13	6	3	1.7	3
	12100R	●	**100**	136	70	50	**31.75**	12.7	8	32	46	8	4	2.3	4
	12125R	●	**125**	161	80	63	**38.1**	15.9	10	38	56	10	5	3.2	4
	12160R	●	**160**	196	100	63	**50.8**	19.1	11	38	72	12	6	6.2	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

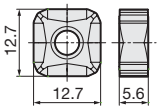
Insert

Dimensions (mm)

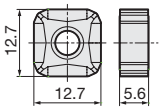
Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	K	K		P M	P M
	General-purpose	K	K		P M	P M
	Roughing			K	P M	P M

Cat. No.	ACK100	ACK200	ACK300	ACP200	ACP300	Cutting Edge Shape	Applications	Fig
SNMT 1205ZNEN-L		●	●	●		V-shaped Edge type	Light Cutting	1
1205ZNEN-G	●	●	●	●			General-purpose	1
1205ZNEN-H	●	●	●	●			Heavy Cutting	1
SNMT 1205ZNEN-SH	●	●	●	●	●	Straight Edge type	Improved Chip Control	2

Fig 1 Fig 2

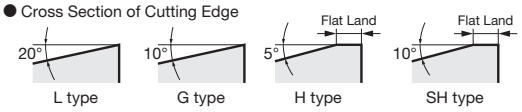


L type/G type/H type



SH type

● Cross Section of Cutting Edge



L type G type H type SH type

Recommended Cutting Conditions H44

Parts

Cat. No.	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seizure Cream
				Handle Grip	Bit	
		N·m				
DNH(S) 12080R to DNH(S) 12100R	BFTX0412IP	3.0	—	HPS1015	TRB15IP	SUMI-P
DNH(S) 12125R to DNH(S) 12160R			TRDR15IP	—	—	SUMI-P

N·m Recommended Tightening Torque (N·m)

DNF 4000 type

P Steel | K Cast Iron | H Hardened Steel

Rake Angle	Radial	-6°
	Axial	-5°

6.5mm / 65°

Face Milling

Fig 1

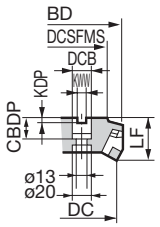


Fig 2

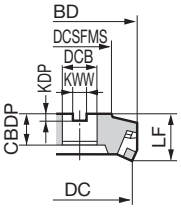


Fig 3

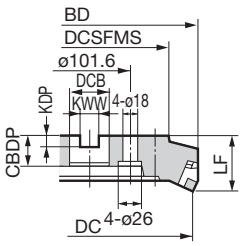


Fig 4

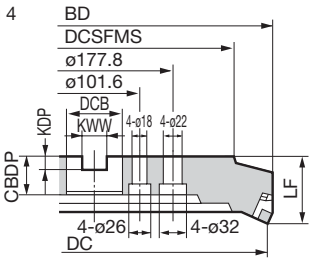


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**DNF 4080R/L**	●		***80**	96	60	50	**25.4**	9.5	6	25	6	1.8	1
	4100R/L	●	●	**100**	116	75	60	**31.75**	12.7	8	32	8	3.0	2
	4125R/L	●		**125**	141	75	60	**38.1**	15.9	10	38	10	4.3	2
	4160R/L	●		**160**	176	100	60	**50.8**	19.1	11	38	12	6.8	2
	4200R/L	●		**200**	216	130	60	**47.625**	25.4	13.5	36	16	9.8	3
	4250R/L			**250**	266	200	70	**47.625**	25.4	13.5	40	20	18.1	3
	4315R/L			**315**	331	240	70	**47.625**	25.4	13.5	40	24	27.4	3
	4400R/L			**400**	416	300	80	**63.5**	25.4	13.5	45	32	49.6	4
	4500R/L			**500**	516	400	80	**63.5**	25.4	13.5	45	40	76.3	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide				Cermet		SUMIBORON	
Process	High-speed/Light Cutting	P			K							P		H	
	General-purpose		P M		K			P	P	K	K		P	H	
	Roughing		P M	P M		K									
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	A30	H10E	G10E	T1500A	T250A	BN2000	Fig
CSNH 43M					●	●		●		●	●			—	1
43MT												●	●	—	1
CSN 43M								●			●			—	2
43MT												●	●	●	2
CSNB 43M								●			●			—	3
43MT													●	—	3
SNC 433														—	—
434														—	—
SNMN 432									●		●	●		—	4
433						●			●		●		●	—	4
434														—	4
SNMN 432TN-S														—	—
433TN-S														—	—
434TN-S														—	—
NW 100										●		●		—	5

Fig 1

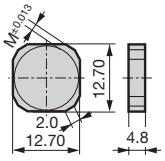


Fig 2

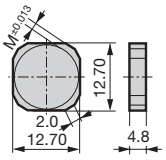


Fig 3

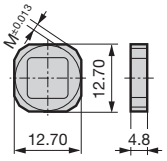


Fig 4

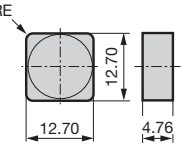
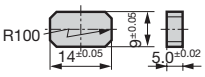
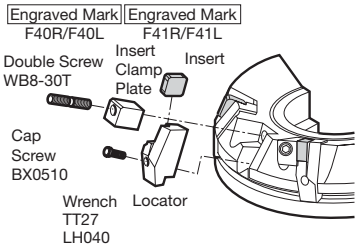


Fig 5 Wiper Insert



Parts

Applicable Cutter	Locator (*)	Insert Clamp Plate
DNF4080R DNF4100R	LNF40R	FTW40R
DNF4125R Up to DNF4500R	LNF40R	FTW41R
DNF4080L Up to DNF4100L	LNF40L	FTW40L
DNF4125L Up to DNF4500L	LNF40L	FTW41L



Double Screw	Size	N·m
WB8-30T	**M8**	**8.0**

*: To use wiper inserts, change locators to LNFW40R(L).

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	80-**100**-120	0.10-**0.13**-0.15	T250A
P	Mild Steel	≤ 180	100-**130**-160	0.10-**0.18**-0.25	T250A
K	Cast Iron	250HB	150-**200**-250	0.10-**0.15**-0.20	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

APG 4000 type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal

Rake Angle	Radial	-2°
	Axial	18°

7mm / 65°

Face Milling

Fig 1

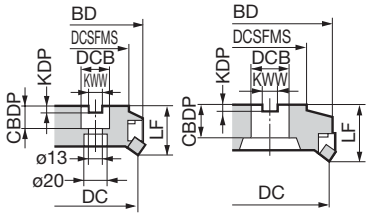


Fig 2

Fig 3

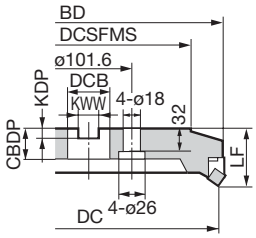


Fig 4

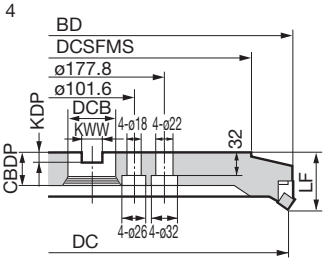


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**APG 4080R/L**	●		***80**	90	60	50	**25.4**	9.5	6	25	5	1.6	1
	4100R/L	●		**100**	110	75	60	**31.75**	12.7	8	32	5	2.7	2
	4125R/L	●		**125**	134	75	60	**38.1**	15.9	10	38	6	4.0	2
	4160R/L	●		**160**	169	100	60	**50.8**	19.1	11	38	8	6.5	2
	4200R/L	●		**200**	208	130	60	**47.625**	25.4	13.5	38	10	9.1	3
	4250R/L	●		**250**	258	200	70	**47.625**	25.4	13.5	40	12	18.3	3
	4315R/L	●		**315**	323	240	70	**47.625**	25.4	13.5	40	16	27.6	3
	4400R/L			**400**	408	300	70	**63.5**	25.4	13.5	45	20	48.4	4
	4500R/L			**500**	508	400	70	**63.5**	25.4	13.5	45	24	68.1	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide		Cermet		DLC	SUMIDIA		
Process	High-speed/Light Cutting	P			K		M		K N	P		N	N	N	
	General-purpose		P M	P M	K			P			P	N	N	N	
	Roughing		P M	P M		K							N	N	
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	H1	T1500A	T250A	DL1000	DA1000	DA2200	Fig
SDCH 42TR								●				—	—	—	1
42TL												—	—	—	1
42TR-R											●	—	—	—	1
42TL-R												—	—	—	1
SDC 42R									●			●	—	—	2
NF-SDC 42R		—	—	—	—	—	—	—	—	—	—	—	●	▲	2
SDC 42L									●			—	—	—	2
42TR								●				—	—	—	2
42TL												—	—	—	2
42TR-R											●	—	—	—	2
42TL-R												—	—	—	2
APW 4R										●		—	●	▲	3

Fig 1

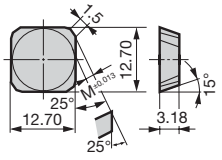


Fig 2

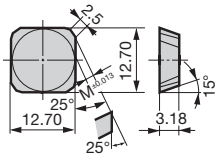
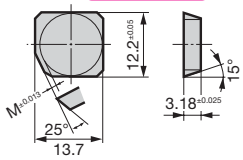
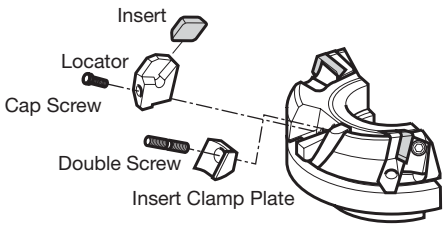


Fig 3 Wiper Insert



Double Screw (Common)	Size	N·m
	M8	**8.0**

Cap Screw	Size	N·m
	M5	**5.0**



Parts

Applicable Cutter	Locator	Cap Screw	Insert Clamp Plate	Double Screw	Wrench
APG4080R	LAP40R	BXF0520R	ATW45R	WB8-20	TH040
APG4100R Up to APG4500R				WB8-22TL	TT27
APG4080L	LAP40L	BXF0520R	ATW45L	WB8-20	TH040
APG4100L Up to APG4500L				WB8-22T	TT27

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	General Steel	180 to 280HB	100-**125**-150	0.10-**0.18**-0.25	A30N
	Mild Steel	≤ 180HB	120-**150**-180	0.10-**0.18**-0.25	A30N
	Die Steel	200 to 220HB	60- **80** -100	0.10-**0.18**-0.25	A30N
M	Stainless Steel	—	120-**150**-180	0.10-**0.18**-0.25	A30N
K	Cast Iron	250HB	60- **90** -120	0.15-**0.23**-0.30	H1
N	Non-Ferrous Alloy	—	300-**650**-1,000	0.10-**0.20**-0.30	H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

DPG 4000 type/DPGF 4000 type

P Steel M Stainless Steel K Cast Iron

Rake Angle	Radial	0°
	Axial	8°

9.5mm / 75°

Face Milling

Fig 1

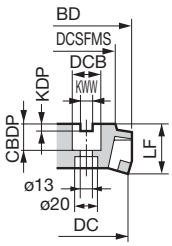


Fig 2

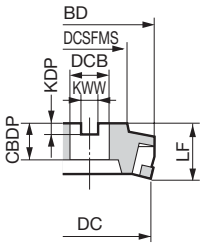


Fig 3

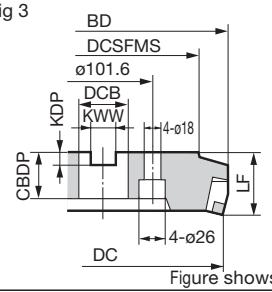


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**DPG 4080R/L**	●		***80**	90	60	50	**25.4**	9.5	6	25	4	1.5	1
	4100R/L	●		**105**	115	75	60	**31.75**	12.7	8	32	5	3.0	2
	4125R/L	●		**125**	135	75	60	**38.1**	15.9	10	38	6	4.0	2
	4160R/L	●		**157**	167	100	60	**50.8**	19.1	11	38	8	6.1	2
	4200R/L	●		**200**	210	130	60	**47.625**	25.4	13.5	38	10	10.0	3
	DPGF 4080R/L	●		***80**	90	60	50	**25.4**	9.5	6	25	6	1.5	1
	4100R/L	●		**105**	115	75	60	**31.75**	12.7	8	32	8	3.0	2
	4125R/L	●		**125**	135	75	60	**38.1**	15.9	10	38	10	4.0	2
	4160R/L	●		**157**	167	100	60	**50.8**	19.1	11	38	12	6.1	2

Inserts are sold separately.

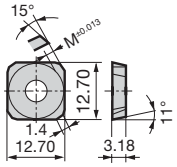
Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide				Cermet		
Process	High-speed/Light Cutting	P			K		M					P		
	General-purpose		PM	PM	K			P	P	K	K		P	
	Roughing		PM	PM		K								
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	A30	H10E	G10E	T1500A	T250A	Fig
SPCH 42R					●	●	●				●			1(2)
42L					●	●					●			2
42TR		●	●	●				●		●				1(2)
42TL			●					●						2
42TR-R												●	●	2
42TL-R													●	2
SPMN 422									●		●	●	●	3
423					●	●			●		●	●		3
SPG 422									●		●	●		3
423											●			3
DPW 500R										●		●		4
500L										●				4

Fig 1 (Grades in ACP/ACK series) Fig 2



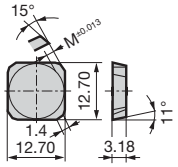


Fig 3

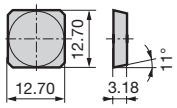
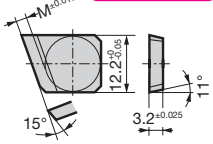
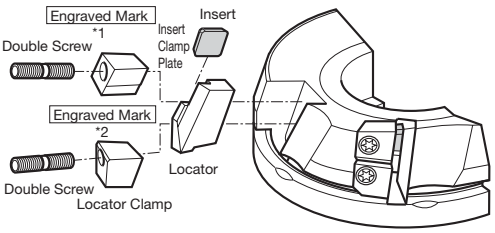


Fig 4 Wiper Insert



Double Screw (Common)	Size	N·m
	M8	8.0



*1 Engraved Mark
T40R,T40L,T41R,T41L,T42R,T42L,
TF80R,TF80L,TF41R,TF41L

*2 Engraved Mark
L40R,L40L,L41R,L41L,L42R,L42L,
LF80R,LF80L,LF41R,LF41L

Parts

Applicable Cutter	Locator	Locator Clamp for DPG	Locator Clamp for DPGF	Insert Clamp for DPG	Insert Clamp for DPGF	Double Screw	Wrench
DPG(F)4080R	GL40R	GLW40R	GLWF80R	GTW40R	GTWF80R	WB8-22T	TT27
DPG(F)4100R Up to DPG(F)4160R	GL40R	GLW41R	GLWF41R	GTW41R	GTWF41R	WB8-30T	TT27
DPG4200R	GL40R	GLW42R	—	GTW42R	—	WB8-30T	TT27
DPG(F)4080L	GL40L	GLW40L	GLWF80L	GTW40L	GTWF80L	WB8-22T	TT27
DPG(F)4100L Up to DPG(F)4160L	GL40L	GLW41L	GLWF41L	GTW41L	GTWF41L	WB8-30T	TT27
DPG4200L	GL40L	GLW42L	—	GTW42L	—	WB8-30T	TT27

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	General Steel	180 to 280HB	100-**125**-150	0.10-**0.15**-0.20	ACP200
P	Mild Steel	≤ 180HB	100-**175**-250	0.10-**0.18**-0.25	ACP200
P	Die Steel	200 to 220HB	80-**120**-160	0.10-**0.15**-0.20	ACP200
M	Stainless Steel	—	80-**120**-160	0.10-**0.15**-0.20	ACP300
K	Cast Iron	250HB	80-**140**-200	0.10-**0.15**-0.20	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

DPG 5000 type

P Steel | M Stainless Steel | K Cast Iron

Rake Angle		
	Radial	0°
	Axial	8°

12mm / 75° — Face Milling

Fig 1

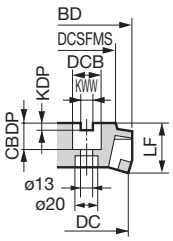


Fig 2

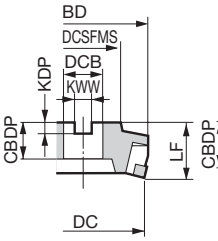


Fig 3

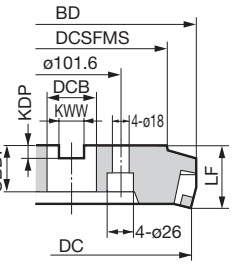


Fig 4

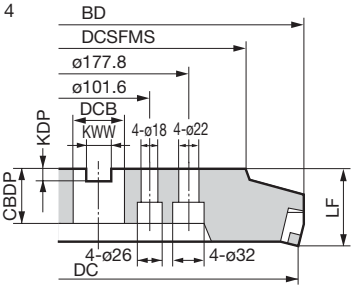


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**DPG 5080R/L**			*82	90	60	50.5	**25.4**	9.5	6	25	4	1.5	1
	5100R/L			**107**	115	75	60.5	**31.75**	12.7	8	32	5	3.0	2
	5125R/L			**127**	135	75	60.5	**38.1**	15.9	10	38	6	4.0	2
	5160R/L			**159**	167	100	60.5	**50.8**	19.1	11	38	8	6.1	2
	5200R/L			**202**	210	130	60.5	**47.625**	25.4	13.5	38	10	10.0	3
	5250R/L			**252**	260	200	70.5	**47.625**	25.4	13.5	52	12	19.7	3
	5315R/L			**317**	325	240	70.5	**47.625**	25.4	13.5	52	14	33.0	3
	5400R/L			**402**	410	300	80.5	**63.5**	25.4	13.5	57	20	60.0	4
	5500R/L			**502**	509	400	80.5	**63.5**	25.4	13.5	57	24	92.0	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide				Cermet		
Process	High-speed/Light Cutting	P			K		M					P		
	General-purpose		PM	PM	K			P	P	K	K		P	
	Roughing		PM	PM		K								
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	A30	H10E	G10E	T1500A	T250A	Fig
SPCH 53R-R					●	●	●				●			1
53L-R											●			1
53TR-R		●	●					●		●		●	●	1
53TL-R			●					●		●				1
SPMN 532									●		●			2
533									●		●			2
GW 500R										●		●		3
500L														3

Fig 1

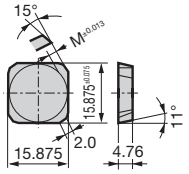


Fig 2

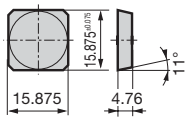
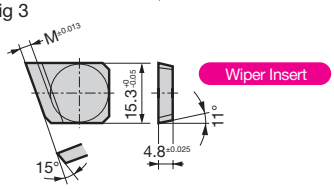
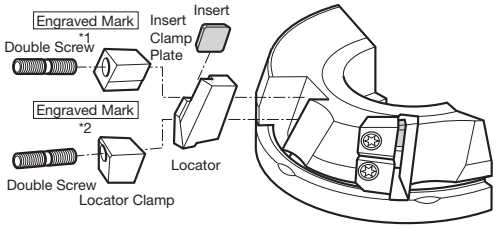


Fig 3



Double Screw (Common)	Size	N·m
	M8	8.0



*1 Engraved Mark: T50R,T50L,T51R,T51L,T52R,T52L

*2 Engraved Mark: L50R,L50L,L51R,L51L,L52R,L52L

Parts

Applicable Cutter	Locator	Locator Clamp	Insert Clamp Plate	Double Screw	Wrench
DPG5080R	GL50R	GLW50R	GTW50R	WB8-22T	TT27
DPG5100R Up to DPG5160R		GLW51R	GTW51R	WB8-30T	
DPG5200R Up to DPG5500R		GLW52R	GTW52R		
DPG5080L	GL50L	GLW50L	GTW50L	WB8-22T	TT27
DPG5100L Up to DPG5160L		GLW51L	GTW51L	WB8-30T	
DPG5200L Up to DPG5500L		GLW52L	GTW52L		

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	General Steel	180 to 280HB	100-**125**-150	0.10-**0.15**-0.20	ACP200
P	Mild Steel	≤ 180HB	100-**175**-250	0.10-**0.18**-0.25	ACP200
P	Die Steel	200 to 220HB	80-**120**-160	0.10-**0.15**-0.20	ACP200
M	Stainless Steel	—	80-**120**-160	0.10-**0.15**-0.20	ACP300
K	Cast Iron	250HB	80-**140**-200	0.10-**0.15**-0.20	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

MEMO

WEZ series

VIDEO OF CUTTING

Expansion

■ Features

● Supports A Variety of Machining Operations

A lineup of cutter sizes from ø14 to ø160mm which enable large ramping angles. 28 repeater type items are now available in addition to the modular type and short shank type.

● Excellent Machining Quality

With a combination of optimised cutting edge shape and high-precision molding technology, superb wall accuracy and surface finish quality are achieved.

● Excellent Sharpness with Low Cutting Force

Reducing machining noise and suppressing burrs, the lineup includes ground type inserts with a focus on sharpness.

● Applicable to Various Work Materials

In addition to the general-purpose grade ACU2500, the new-generation coated carbide grades XCU2500/XCK2000 are available. Applicable to various work materials such as steel, stainless steel, cast iron, exotic alloys, and more.

■ Product Range (Standard)

Type	Cat. No.	Dia. (mm)																
		ø14	ø16	ø18	ø20	ø22	ø25	ø26	ø28	ø30	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Shell	WEZ 11000RS												4 6	5 7	6 8	7 10	9 12		
Shell	WEZ 11000R Inch															7 10	9 12		
Shell	WEZ 17000RS												3 4	3 5	4 6	4 7	5 8	6 9 11	8 10 12
Shell	WEZ 17000R Inch															4 7	5 8	6 9 11	8 10 12
Shank	WEZ 11000E	1	2*	2	2* 3*	3	2 3* 4*		4	4	2 3 4 5*	5	2 4 6	5 7	8	10			
Shank	WEZ 11000ES For multi-tasking machines	1	2*		3*		4*												
Shank	WEZ 11000EL	1	2*	2	2*	2	2* 3		2	2	2* 3	2 3	2	3					
Shank	WEZ 17000E						2*		2	3	2 3*	3	3 4	3* 5*	4* 6*	7			
Shank	WEZ 17000ES For multi-tasking machines						2				3								
Shank	WEZ 17000EL						2		2	2	2* 3	2	2 3 4	3* 5*	4* 6*				
Modular	WEZ 11000M		2	2	2 3	3	2 3 4	4 5	4 5	2 4 5	2 3 4 5	2 5	2 4 5 6						
Modular	WEZ 17000M						2 3		2	2 3	2 3 4	2 3	2 3 4						

Number in ●●● shows the number of teeth Inch Inch Bore *mark: Different diameter shanks in stock

Modular type H256

■ Product Range (Repeater) New

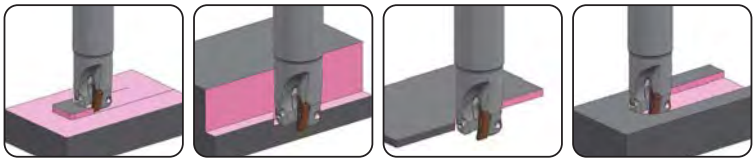
Type	Cat. No.	Dia. (mm)								
		ø20	ø25	ø30	ø32	ø35	ø40	ø50	ø63	ø80
Shell	WEZR 11000RS						4	4		
Shell	WEZR 17000RS							2 3 4	3 4 5	5
Shank	WEZR 11000E	1 2	2	2	2 3	3	3 4			
Shank	WEZR 17000E						2 3	2 3		
Modular	WEZR 11000M				3					
Modular	WEZR 17000M						3			

Number in ●●● represent the effective number of teeth

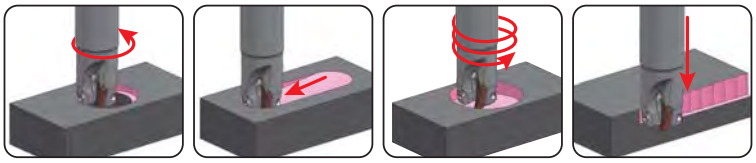
Modular type H260

■ Supports Ramping/Helical Milling/Plunge Milling Applicable to various applications!

Face Milling | Shoulder Milling | Side Milling | Groove Milling



Hole Expansion Milling | Ramping | Helical Milling* | Plunge Milling



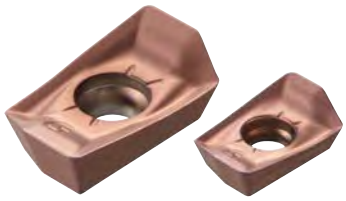
*Helical milling is not recommended for WEZR type products.

■ Optimised Body Design Wide Guide Face for Stable Insert Clamping

■ Chipbreaker Selection

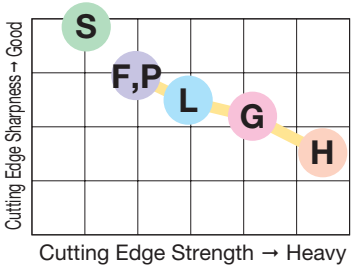
Work Material	P Steel, M Stainless Steel, K Cast Iron, S Heat-resistant Alloy, Titanium Alloy, H Hardened Steel					N Non-Ferrous Metal
Applications	Light Cutting	General-purpose to Interrupted Milling	Heavy Cutting	Light Cutting	Light Cutting	Non-Ferrous Metals
Features	Low-rigidity Machining	Standard	Heavy Interrupted Cutting Hardened Steel	Medium Finishing Burr Prevention	High-precision Machining High Wall Surface Squareness	Low Cutting Force
Chipbreaker	L type	G type	H type	F type	P type	S type
Cutting Edge Cross Section 11 type	Not Available	0.05mm, 28°	0.15mm, 20°	28°		28°
Cutting Edge Cross Section 17 type	0.05mm, 28°	0.15mm, 20°	0.2mm, 10°	28°		28°

■ Insert Size Comparison



AO□T17 type　AO□T11 type

■ Chipbreaker Selection Guide



■ Product Range (Insert)

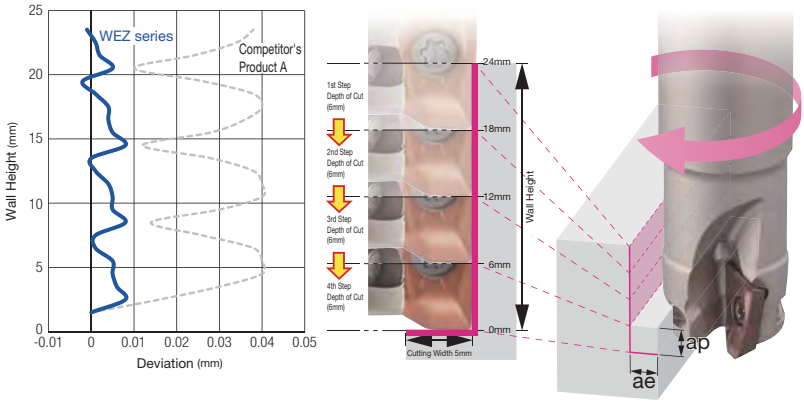
●: Standard stocked item

		Cat. No.	Corner Radius (mm)												
			R0.2	R0.4	R0.5	R0.8	R1.0	R1.2	R1.6	R2.0	R2.4	R3.0	R3.2	R4.0	R5.0	R6.4
11 type	M Class	AOMT11T3○○PEER-G	●	●	●	●	●	●	●	●	●	●	●			
		AOMT11T3○○PEER-H		●		●		●	●							
	E Class	AOET11T3○○PEER-F	●	●	●	●	●	●	●	●	●	●	●			
		AOET11T3○○PEER-P16	●	●	●	●	●	●								
		AOET11T3○○PEER-P20	●	●	●	●	●	●								
		AOET11T3○○PEER-P25	●	●	●	●	●	●								
		AOET11T3○○PEFR-S	●	●	●	●	●	●	●	●	●	●	●			
17 type	M Class	AOMT1705○○PEER-L	●	●		●		●	●							
		AOMT1705○○PEER-G	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		AOMT1705○○PEER-H		●		●		●	●							
	E Class	AOET1705○○PEER-F	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		AOET1705○○PEER-P25	●	●	●	●	●	●								
		AOET1705○○PEER-P32	●	●	●	●	●	●								
		AOET1705○○PEFR-S	●	●	●	●	●	●	●	●	●	●	●	●	●	●

P type chipbreaker Cat. No. is specific to a range of cutter diameters. For details, see P type Chipbreaker Selection on H56.

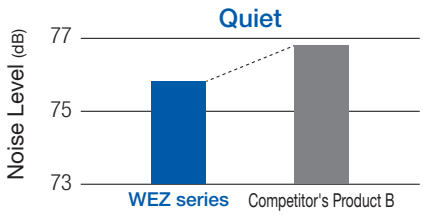
■ Cutting Performance

● Good Wall Accuracy



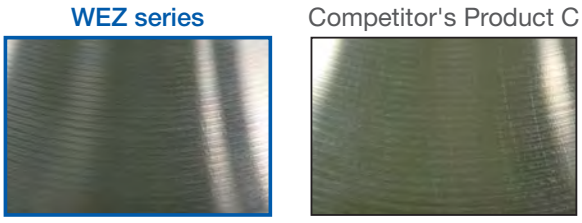
Machine	: Vertical Machining Centre BT40, Work Material: S50C
Tool	: WEZ 11020E03 (ø20, 3 teeth)
Insert	: AOMT 11T308PEER-G (ACU2500)
Cutting Conditions	: vc = 150m/min, fz = 0.15mm/t, ap = 6mm x 4 Passes, ae = 5mm, Dry

● Lower Cutting Force Helps Reduce Machining Noise



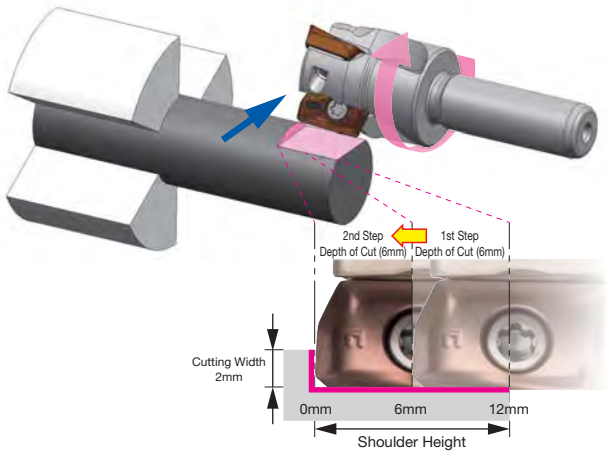
Machine	: Vertical Machining Centre BT40, Work Material: S50C
Tool	: WEZ 11020E03 (ø20, 3 teeth)
Insert	: AOMT 11T308PEER-G (ACU2500)
Cutting Conditions	: vc = 150m/min, fz = 0.15mm/t, ap = 8mm, ae = 5mm, Dry

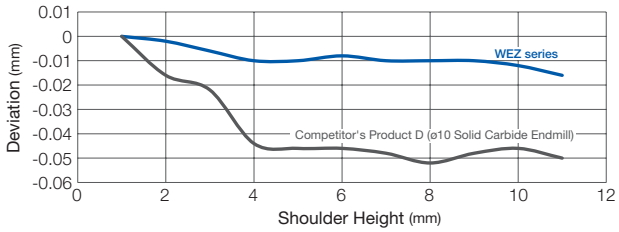
● Excellent Surface Quality

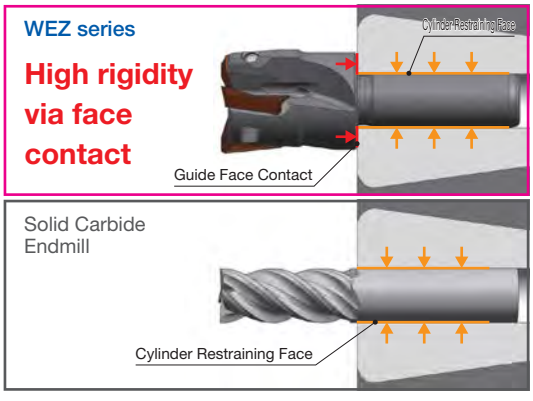


Machine	: Vertical Machining Centre BT50, Work Material (SCM440)
Tool	: WEZ 17100RS08 (ø100, 8 teeth)
Insert	: AOMT 170508PEER-G (ACU2500)
Cutting Conditions	: vc = 250m/min, fz = 0.15mm/t, ap = 2mm, ae = 85mm, Dry

● Good Wall Accuracy (for Multi-tasking Machines)





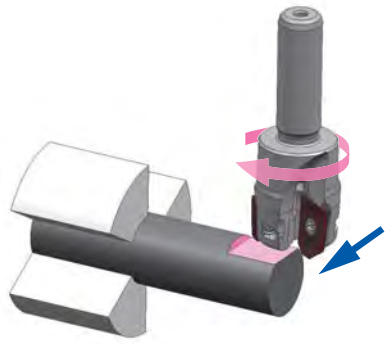


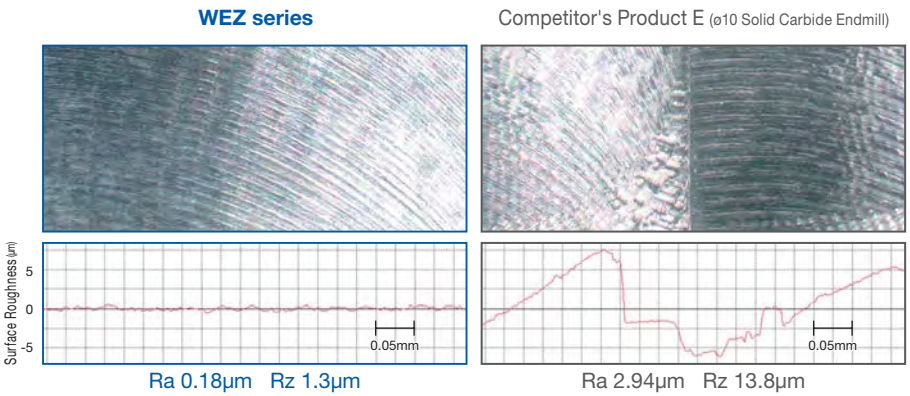
Machine:	Multi-tasking Machine, Work Material: SUS304 ø16 Round Bar
Tool:	WEZ11020ES03-10 (ø20, 3 teeth)
Insert:	AOET11T308PEER-F (ACU2500)
Cutting Conditions:	vc = 100m/min, fz = 0.08mm/t, ap = 6mm x 2 Passes, ae = 2mm, Wet

● Excellent machine surface quality (for multi-tasking machines)

Larger tool diameter than solid carbide endmills enables reduced number of passes for high-efficiency machining!

Good wall accuracy and machined surface quality, eliminating the finishing process!





Ra 0.18μm Rz 1.3μm

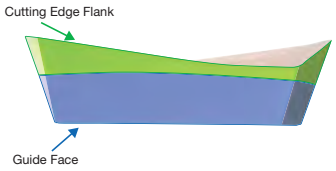
Ra 2.94μm Rz 13.8μm

Machine	: Multi-tasking Machine, Work Material: SUS304 ø16 Round Bar Tool: WEZ11020ES03-10 (ø20, 3 teeth)
Insert	: AOET11T308PEER-F (ACU2500)
Cutting Conditions	: WEZ type vc = 100m/min, fz = 0.05mm/t, ap = 2mm, ae = 12mm Wet Competitor's Product E vc = 100m/min, fz = 0.05mm/t, ap = 2mm, ae = 6mm x 2 Passes Wet (Solid Carbide Endmill)

■ High-precision ground type insert with excellent sharpness

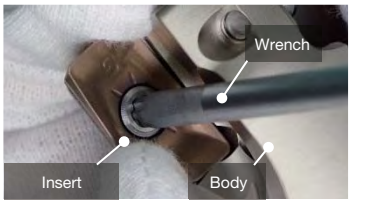
● Ground finish on cutting edge and guide face

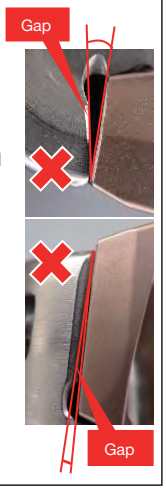
The cutting edge, as well as the guide faces are ground finish to minimize corner variations when mounted on the body. Stable edge run-out accuracy and machining quality can be realized!



Precautions for Mounting Inserts

(1) Clean the mounting seat surface and contact parts.
(2) While pressing the insert firmly against the seat surface, fasten the screw with the included wrench.
(3) Apply Anti-seizure Cream to the screw and tighten at the recommended torque.
(4) After tightening, check that there are no gaps on the seat surface.

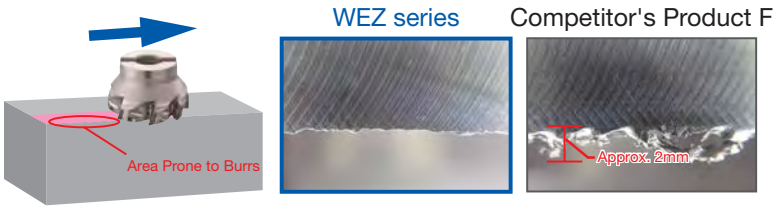




■ Lineup of Chipbreakers for Ground type Inserts

● F type Chipbreaker - Emphasises Edge Sharpness

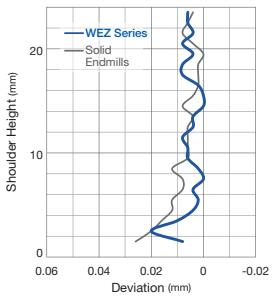
· Sharpness from ground finish enables burr control
· Good wall accuracy with all cutter diameters

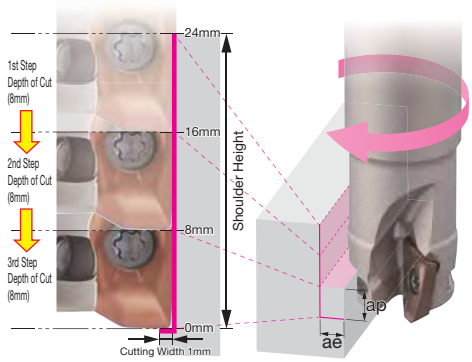


Machine	: Vertical Machining Centre BT50, Work Material: SUS304
Tool	: WEZ 11050RS07 (ø50, 7 teeth)
Insert	: AOET 11T308PEER-F (ACU2500)
Cutting Conditions	: vc = 120m/min, fz = 0.12mm/t, ap = 1mm, ae = 30mm, Dry

● P type Chipbreaker - Achieves Wall Squareness Equivalent to Using Solid Endmills

· High-precision type with cutting edge shape optimised for each cutter diameter while maintaining the F type chipbreaker's sharpness
· Enables wall squareness equal to using solid endmills, through cutting edge shape optimisation for each cutter diameter





Machine	: Vertical Machining Centre BT50, Work Material: S50C
Tool	: WEZ 11020E03 (ø20, 3 teeth)
Insert	: AOET 11T308PEER-P20 (ACU2500)
Cutting Conditions	: vc = 150m/min, fz = 0.1mm/t, ap = 8mm x 3 Passes, ae = 1mm, Dry

P type Chipbreaker Selection Guide

Cat. No.	Dia. (mm)										
	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30	ø32	ø35	ø40 and above
AOET11T3○○PEER-P○○	-P16		-P20		Not applicable	-P25		Not applicable			
AOET1705○○PEER-P○○	Not applicable					-P25		-P32			Not applicable

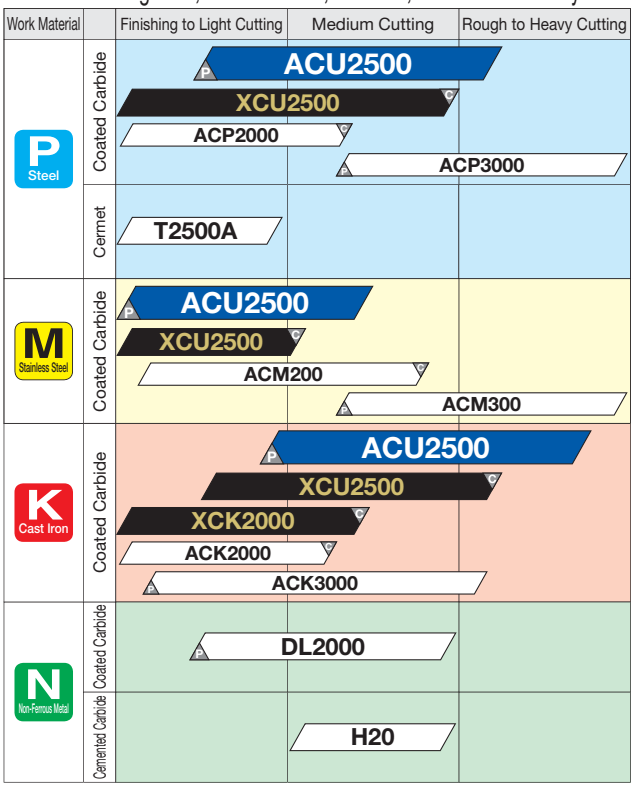
● S type Chipbreaker - Sharp-Edged Breaker for Non-Ferrous Metals with Excellent Adhesion Resistance

· Suppresses adhesion with rake face lapping
· DLC Coat inserts available for further improved adhesion resistance

Machine	: Vertical Machining Centre BT30, Work Material: ADC12
Tool	: WEZ 11020E03 (ø20, 3 teeth)
Insert	: AOET 11T308PEFR-S (H20)
Cutting Conditions	: vc = 350m/min, fz = 0.1mm/t, ap = 3mm, ae = 10mm, Dry

■ Grade Application Range

New-generation coated carbide grades **XCU2500/XCK2000** now available!
Enhanced lineup of coated grades in addition to cemented carbide and cermet for milling steel, stainless steel, cast iron, and aluminum alloy.

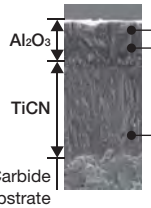


The letters "C" and "P" at the end of each grade indicate the coating type. ▽: CVD △: PVD

■ Grade Features

New coating technology that realises absolute stability ABSOTECH™ (Absolute Technology)

ABSOTECH — CVD



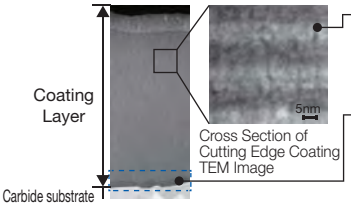
Special Surface Treatment
Suppresses thermal cracking by introducing high compressive stress, resulting in chipping resistance more than twice that of conventional types

Crystal Orientation Control Al_2O_3
By controlling the growth direction, Al_2O_3 is reinforced for crater wear resistance more than twice that of conventional types

High Hardness TiCN
Increased TiCN hardness by using a C-rich composition for flank wear resistance more than twice that of conventional types

Applicable Grades: ACP2000, ACK2000

ABSOTECH — PVD

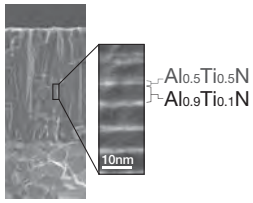


New Super Multi-Layered Structure
Higher hardness and twice the conventional wear resistance due to a fine crystal structure AlTiCrBN-based nano-layered coating

High Adhesion Strength
Significantly improved coating adhesion has more than twice the chipping resistance as conventional coatings.

Applicable Grades: ACU2500, ACP3000, ACK3000

ABSOTECH X — CVD



Pure Cubic Crystal AlTiN with High Al Content
With proprietary structural control technology, differently composed layers of AlTiN are stacked at the nanometre level. With a high-Al composition containing over 80% Al on average, it also maintains a cubic crystalline structure to achieve excellent thermal resistance and high hardness. Vastly improved wear resistance.

Special Surface Treatment
Proprietary surface treatment introduces high compression stress to the coating, suppressing the development of cracks. Greatly improved fracture and thermal crack resistance.

Applicable Grades: XCU2500, XCK2000

■ Grade Characteristic Values

CVD

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grade
P Steel	ACP2000	89.5	3.2	Absotech	10	· For high-speed machining of steel · Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal crack resistance	ACP100
P Steel	XCU2500	89.5	3.2	Absotech X	6	· General-purpose grade for a wide variety of materials such as steel, cast iron and stainless steel · New coating combining wear and fracture resistance realises long tool life in medium-speed to high-speed machining	—
M Stainless Steel	ACM200	89.8	3.4	Super FF Coat	6	· For machining high-hardness stainless steel · Adopts a newly developed high-strength cemented carbide substrate with excellent wear resistance and thermal resistance, realizing outstanding stability when machining hardened stainless steel	AC230
K Cast Iron	ACK2000	91.7	3.1	Absotech	10	· For high-speed cast iron milling · Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal resistance	ACK100 ACK200
K Cast Iron	XCK2000	91.7	2.5	Absotech X	6	· For high-speed cast iron milling · Along with a high-hardness carbide substrate, the new coating combining wear and fracture resistance realises superb long tool life in medium-speed to high-speed machining	—

PVD

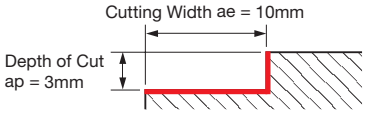
Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grade
P Steel	ACU2500	91.6	3.8	Absotech	3	· General-purpose grade supporting steel, stainless steel, and cast iron machining · Adopts a carbide substrate with excellent fracture resistance and wear resistance, plus a new coating with excellent wear resistance and chipping resistance, realising stable long tool life with various work material grades	—
P Steel	ACP3000	89.5	3.2	Absotech	3	· Our 1st recommended grade for milling steel · Carbide substrate with excellent thermal crack resistance, plus a new coating with excellent wear resistance and chipping resistance, realises stable long tool life over a wide range of cutting conditions	ACP200 ACP300
M Stainless Steel	ACM300	89.8	3.4	(New) Super ZX Coat	3	· Our 1st recommended grade for milling stainless steel · Adopts a high-strength carbide substrate and super multi-layered coating for next-level wear resistance and fracture resistance	—
K Cast Iron	ACK3000	91.7	3.1	Absotech	3	· Our 1st recommended grade for milling cast iron · Adopts a high thermal conductivity carbide substrate and a new coating with excellent wear resistance and chipping resistance, realizing stable long tool life over a wide range of cast iron machining operations	ACK300
N Non-Ferrous Metal	DL2000	91.6	3.8	AURORA Coat (DLC)	0.5	· Grade for milling non-ferrous metal, utilising DLC coat with a low coefficient of friction and excellent adhesion resistance	—

Cermet

Work Material	Grade	Hardness (HRA)	TRS (GPa)	Coating type	Coating Thickness (μm)	Features	Old Grade
P Steel M Stainless Steel	T2500A	91.8	2.4	—	—	· For finishing of steel and stainless steel · Fine, uniform grain structure greatly improves toughness, realising long tool life and excellent surface finishes	T250A

■ Recommended Cutting Conditions

WEZ11 type



Tool: WEZ11020E03, Insert: AO□T11T3 type

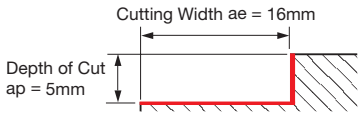
Cutting Conditions: Depth of Cut ap = 3mm, Cutting Width ae = 10mm, Dry

ISO Classification	Work Material		Work Material Hardness (HB)	Chipbreaker	Grade: ACU2500	XCU2500	ACP2000	ACP3000	T2500A	XCK2000	ACK2000	ACK3000	ACM200	ACM300	DL2000
					Feed Rate per Tooth fz (mm/t) Min. - **Optimum** - Max.										
					0.08 - **0.15** - 0.20	0.08 - **0.15** - 0.20	0.08 - **0.15** - 0.20	0.08 - **0.15** - 0.20	0.08 - **0.12** - 0.18	0.08 - **0.15** - 0.20	0.08 - **0.15** - 0.20	0.08 - **0.15** - 0.20	0.08 - **0.15** - 0.20	0.08 - **0.15** - 0.20	0.05 - **0.10** - 0.15
					Cutting Speed vc (m/min) Min. - **Optimum** - Max.										
P	Steel, Carbon Steel	S15C	125	G	270 - **320** - 370	300 - **350** - 400	300 - **350** - 400	250 - **300** - 350	230 - **280** - 330						
		S45C	190	G	170 - **220** - 270	200 - **250** - 300	200 - **250** - 300	150 - **200** - 250	130 - **180** - 230						
		S45C Hardened	250	G	140 - **180** - 220	160 - **200** - 245	160 - **200** - 245	120 - **160** - 200	105 - **145** - 185						
		S75C	270	G	110 - **145** - 175	130 - **165** - 195	130 - **165** - 195	100 - **130** - 165	85 - **115** - 150						
		S75C Hardened	300	G	70 - **90** - 110	80 - **100** - 120	80 - **100** - 120	60 - **80** - 100	50 - **70** - 90						
	Low-alloy Steel	SCM, SNCM	180	G	160 - **205** - 255	190 - **235** - 280	190 - **235** - 280	140 - **190** - 235	120 - **170** - 215						
		SCM, SNCM Hardened	275	G	95 - **120** - 150	110 - **135** - 165	110 - **135** - 165	80 - **110** - 140	70 - **100** - 125						
		SCM, SNCM Hardened	300	G	85 - **110** - 130	100 - **125** - 150	100 - **125** - 150	75 - **100** - 125	65 - **90** - 115						
		SCM, SNCM Hardened	350	G	60 - **80** - 100	70 - **90** - 110	70 - **90** - 110	50 - **70** - 90	45 - **65** - 85						
	High-alloy Steel	SKD, SKT, SKH	200	G	140 - **180** - 220	160 - **200** - 245	160 - **200** - 245	120 - **160** - 205							
		SKD, SKT, SKH Hardened	325	G	55 - **70** - 85	60 - **80** - 100	60 - **80** - 100	50 - **65** - 80							
M	Stainless Steel	SUS430, Others (Martensitic/ Ferritic)	200	G	110 - **140** - 170	160 - **190** - 210							140 - **170** - 190	90 - **110** - 140	
		SUS403 and Others (Martensitic Hardened)	240	G	100 - **125** - 150	145 - **170** - 190							125 - **150** - 170	80 - **100** - 125	
		SUS304, SUS316 (Austenitic)	180	G	120 - **150** - 180	170 - **200** - 220							150 - **180** - 200	100 - **120** - 150	
K	Cast Iron			G	150 - **200** - 250	250 - **300** - 350				250 - **300** - 350	250 - **300** - 350	170 - **220** - 270			
	Ductile Cast Iron			G	90 - **120** - 150	150 - **180** - 210				150 - **180** - 210	150 - **180** - 210	100 - **130** - 160			
S	Exotic Alloy	Heat-Resistant Alloy		G	30 - **40** - 55								35 - **45** - 60	25 - **35** - 50	
		Ti Alloy		G	60 - **80** - 100								70 - **90** - 110	50 - **70** - 90	
N	Aluminum Alloy	Si content of 12.6% or less		S											500 - **750** - 1000
		Si content of over 12.6%		S											170 - **200** - 250
	Copper Alloy			S											300 - **330** - 350

● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
● For groove milling, adjust the feed rate to around 70% of the above values.

Note · The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
· The above are the recommended conditions for WEZ11 type overall. Use within the maximum allowable spindle speed.

WEZ17 type



Tool: WEZ17032E03, Insert: AO□T1705 type

Cutting Conditions: Depth of Cut ap = 5mm, Cutting Width ae = 16mm, Dry

ISO Classification	Work Material		Work Material Hardness (HB)	Chipbreaker	Grade: ACU2500	XCU2500	ACP2000	ACP3000	T2500A	XCK2000	ACK2000	ACK3000	ACM200	ACM300	DL2000
					Feed Rate per Tooth fz (mm/t) Min. - **Optimum** - Max.										
					0.10 - **0.20** - 0.28	0.10 - **0.20** - 0.28	0.10 - **0.20** - 0.28	0.10 - **0.20** - 0.28	0.10 - **0.15** - 0.22	0.10 - **0.20** - 0.28	0.10 - **0.20** - 0.28	0.10 - **0.20** - 0.28	0.10 - **0.20** - 0.28	0.10 - **0.20** - 0.28	0.05 - **0.10** - 0.15
					Cutting Speed vc (m/min) Min. - **Optimum** - Max.										
P	Steel, Carbon Steel	S15C	125	G	285 - **335** - 390	315 - **360** - 420	315 - **360** - 420	265 - **315** - 370	240 - **295** - 345						
		S45C	190	G	180 - **230** - 285	210 - **265** - 315	210 - **265** - 315	160 - **210** - 265	135 - **190** - 240						
		S45C Hardened	250	G	145 - **190** - 230	170 - **210** - 255	170 - **210** - 255	130 - **170** - 215	110 - **155** - 195						
		S75C	270	G	115 - **150** - 185	135 - **170** - 205	135 - **170** - 205	100 - **135** - 170	90 - **125** - 155						
		S75C Hardened	300	G	70 - **90** - 115	85 - **105** - 125	85 - **105** - 125	65 - **85** - 105	55 - **75** - 95						
	Low-alloy Steel	SCM, SNCM	180	G	170 - **220** - 265	200 - **245** - 295	200 - **245** - 295	150 - **200** - 250	130 - **180** - 225						
		SCM, SNCM Hardened	275	G	100 - **130** - 155	115 - **145** - 175	115 - **145** - 175	85 - **115** - 145	75 - **105** - 135						
		SCM, SNCM Hardened	300	G	90 - **115** - 140	105 - **130** - 155	105 - **130** - 155	75 - **105** - 130	65 - **90** - 120						
		SCM, SNCM Hardened	350	G	65 - **85** - 100	75 - **95** - 115	75 - **95** - 115	55 - **75** - 95	50 - **70** - 85						
	High-alloy Steel	SKD, SKT, SKH	200	G	145 - **185** - 230	170 - **215** - 255	170 - **215** - 255	130 - **170** - 215							
		SKD, SKT, SKH Hardened	325	G	55 - **75** - 90	65 - **85** - 100	65 - **85** - 100	50 - **65** - 85							
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200	G	115 - **145** - 175	165 - **195** - 215							145 - **175** - 195	100 - **115** - 145	
		SUS403 and Others (Martensitic Hardened)	240	G	105 - **130** - 155	150 - **175** - 195							130 - **155** - 175	85 - **105** - 130	
		SUS304, SUS316 (Austenitic)	180	G	125 - **155** - 190	180 - **210** - 230							160 - **190** - 210	105 - **125** - 160	
K	Cast Iron			G	160 - **210** - 265	265 - **315** - 370				265 - **315** - 370	265 - **315** - 370	180 - **230** - 285			
	Ductile Cast Iron			G	95 - **125** - 160	160 - **190** - 220				160 - **190** - 220	160 - **190** - 220	105 - **140** - 170			
S	Exotic Alloy	Heat-Resistant Alloy		G	30 - **40** - 60								35 - **45** - 60	25 - **35** - 50	
		Ti Alloy		G	60 - **85** - 105								75 - **95** - 115	50 - **75** - 95	
N	Aluminum Alloy	Si content of 12.6% or less		S											500 - **750** - 1000
		Si content of over 12.6%		S											170 - **200** - 250
	Copper Alloy			S											300 - **330** - 350

● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
● For groove milling, adjust the feed rate to around 70% of the above values.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

■ Maximum Allowable Spindle Speed

WEZ11

Dia. DC(mm)	n max(min^{-1})	Dia. DC(mm)	n max(min^{-1})
14	12,000(7,500)	**32**	17,200
16	29,000	**35**	16,250
18	26,150	**40**	14,950
20	24,000	**50**	13,100
22	22,300	**63**	11,500
25	20,300	**80**	10,050
28	18,800	**100**	8,900
30	17,950		

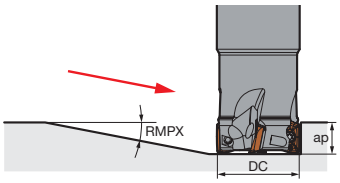
WEZ17

Dia. DC(mm)	n max(min^{-1})	Dia. DC(mm)	n max(min^{-1})
25	15,700	**80**	7,250
28	14,350	**100**	6,400
30	13,650	**125**	5,650
32	13,000	**160**	4,950
35	12,200		
40	11,100		
50	9,600		
63	8,350		

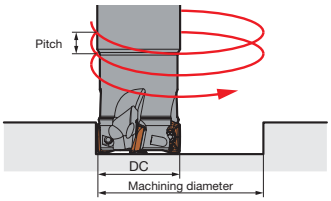
*The parentheses above refer to the use of WEZ11014EL01.
*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

■ Ramping/Helical Milling Upper Limit

Ramping



Helical Milling



WEZ11 type

Dia. DC (mm)	Max. Ramping Angle RMPX(°)	Helical Milling					
		Max. Machining Dia. (mm)	Max. Pitch (mm/rev)	Standard Diameter (mm)	Max. Pitch (mm/rev)	Min. Machining Dia. (mm)	Max. Pitch (mm/rev)
14	8.0	25.3	5.0	23.1	3.4	19.0	1.5
16	10.5	29.3	7.6	27.0	5.6	21.7	1.5
18	8.1	33.3	6.7	30.9	5.0	25.2	1.4
20	6.5	37.3	6.0	34.9	4.6	29.1	1.3
22	5.3	41.3	5.4	38.8	4.3	32.9	1.3
25	4.1	47.3	4.8	44.8	3.9	38.9	1.3
28	3.4	53.3	4.4	50.7	3.6	44.9	1.3
30	3.0	57.3	4.2	54.7	3.5	48.8	1.3
32	2.7	61.3	4.0	58.7	3.3	52.8	1.2
35	2.3	67.3	3.8	64.6	3.1	58.8	1.2
40	1.8	77.3	3.4	74.6	2.9	68.8	1.2
50	1.2	97.3	3.0	94.6	2.6	88.8	1.1
63	0.8	123.3	2.8	120.5	2.5	114.7	1.1
80	Not recommended						
100	Not recommended						

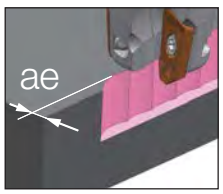
*The table above shows values with corner radius 0.8mm. Helical milling is not recommended for WEZR type products.

WEZ17 type

Dia. DC (mm)	Max. Ramping Angle RMPX(°)	Helical Milling					
		Max. Machining Dia. (mm)	Max. Pitch (mm/rev)	Standard Diameter (mm)	Max. Pitch (mm/rev)	Min. Machining Dia. (mm)	Max. Pitch (mm/rev)
25	10.8	47.3	13.0	41.0	8.3	33.1	1.8
28	8.1	53.3	11.1	46.9	7.5	39.0	1.8
30	7.0	57.3	10.2	50.9	7.0	43.0	1.8
32	6.1	61.3	9.5	54.9	6.7	47.0	1.7
35	5.1	67.3	8.7	60.8	6.2	53.0	1.7
40	4.0	77.3	7.7	70.8	5.7	63.0	1.7
50	2.5	97.3	6.5	90.7	5.0	83.0	1.6
63	1.8	123.3	5.6	116.7	4.5	109.0	1.6
80	1.2	156.0	5.0	149.4	4.1	141.8	1.5
100	0.9	197.3	4.7	190.7	4.0	183.1	1.5
125	Not recommended						
160	Not recommended						

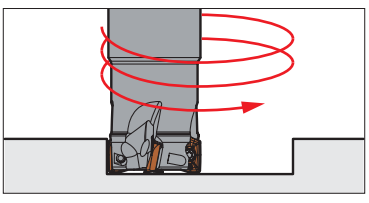
*The table above shows values with corner radius 0.8mm. Helical milling is not recommended for WEZR type products.

■ Plunge Cutting Upper Limit



	Max. ae (mm)
WEZ11 type	3
WEZ17 type	5

■ Precautions for Helical Milling



- For helical milling, if the work diameter is smaller than the standard diameter, there will be a centre uncut portion.
- A prepared centre hole should be made.
- Above the standard diameter, this portion can be removed by traverse cutting with the same cutter.

WEZ 11000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-7° to -11°
	Axial	14° to 15°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

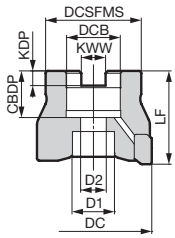


Fig 2

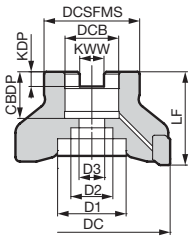
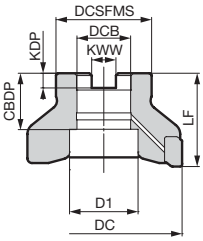


Fig 3



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Number of Teeth	Weight (kg)	Fig
Metric	**WEZ 11040RS04**	●	**40**	33	40(39.7)	**16**	8.4	5.6	18	14	9	—	4	0.21	1
	11040RS06	●	**40**	33	40(39.7)	**16**	8.4	5.6	18	14	9	—	6	0.20	1
	11050RS05	●	**50**	41	40(39.7)	**22**	10.4	6.3	20	18	11	—	5	0.32	1
	11050RS07	●	**50**	41	40(39.7)	**22**	10.4	6.3	20	18	11	—	7	0.31	1
	11063RS06	●	**63**	50	40(39.7)	**22**	10.4	6.3	20	18	11	—	6	0.58	1
	11063RS08	●	**63**	50	40(39.7)	**22**	10.4	6.3	20	18	11	—	8	0.57	1
	11080RS07	●	***80**	55	50(49.7)	**27**	12.4	7	22	20	14	—	7	1.08	1
	11080RS10	●	***80**	55	50(49.7)	**27**	12.4	7	22	20	14	—	10	1.07	1
	11100RS09	●	**100**	70	50(49.7)	**32**	14.4	8	32	46	—	—	9	1.57	3
	11100RS12	●	**100**	70	50(49.7)	**32**	14.4	8	32	46	—	—	12	1.56	3
Inch	**WEZ 11080R07**	●	***80**	55	50(49.7)	**25.4**	9.5	6	25	20	14	—	7	1.09	1
	11080R10	●	***80**	55	50(49.7)	**25.4**	9.5	6	25	20	14	—	10	1.08	1
	11100R09	●	***100**	70	63(62.7)	**31.75**	12.7	8	32	46	27	18	9	2.12	2
	11100R12	●	***100**	70	63(62.7)	**31.75**	12.7	8	32	46	27	18	12	2.10	2

The LF dimensions in parentheses are dimensions using RE = 3.0/3.2 insert.
When using RE = 3.0/3.2 inserts, the maximum depth of cut is 9.5mm.
Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
	N·m		
BFTX0306IP	**1.5**	TRDR08IP	SUMI-P

Identification Code

WEZ **11** **050** **R** **S** **07**

Series Code	Insert Size	Dia.	Feed Direction	Metric Bore	Number of Teeth

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ11 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT11T324PEER)
Corner radius = 3.0: C2.5
(AOMT11T330PEER)
Corner radius = 3.2: C2.5
(AOMT11T332PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m)

WEZ 11000R(S) type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		P K M	P		K	K		M S		N	P		
	General-purpose	P K M S	P K M		P	K		K	M S	M S	N	N		
	Roughing	P K M S			P			K		M S				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 11T302PEER-G		●	●		●	●		●	●	●	—	—	●	0.2	1
11T304PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
11T305PEER-G		●							●	●	—	—		0.5	1
11T308PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
11T310PEER-G		●							●	●	—	—		1.0	1
11T312PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
11T316PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
11T320PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
11T324PEER-G		●							●	●	—	—		2.4	1
11T330PEER-G		●	●		●	●		●	●	●	—	—		3.0	2
11T332PEER-G		●							●	●	—	—		3.2	2
AOMT 11T304PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
11T308PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
11T312PEER-H		●							●	●	—	—	—	1.2	1
11T316PEER-H		●							●	●	—	—	—	1.6	1
AOET 11T302PEER-F		●		—			—		—		—	—	—	0.2	1
11T304PEER-F		●		—			—		—		—	—	—	0.4	1
11T305PEER-F		●		—			—		—		—	—	—	0.5	1
11T308PEER-F		●		—			—		—		—	—	—	0.8	1
11T310PEER-F		●		—			—		—		—	—	—	1.0	1
11T312PEER-F		●		—			—		—		—	—	—	1.2	1
11T316PEER-F		●		—			—		—		—	—	—	1.6	1
11T320PEER-F		●		—			—		—		—	—	—	2.0	1
11T324PEER-F		●		—			—		—		—	—	—	2.4	1
11T330PEER-F		●		—			—		—		—	—	—	3.0	2
11T332PEER-F		●		—			—		—		—	—	—	3.2	2
AOET 11T302PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
11T304PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
11T305PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
11T308PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
11T310PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
11T312PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
11T316PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
11T320PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
11T324PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
11T330PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	2
11T332PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	2

Fig 1

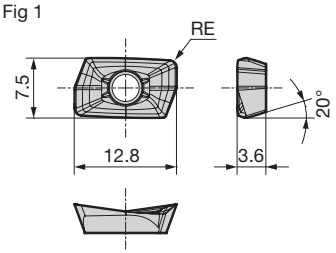
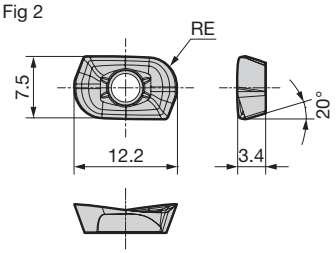


Fig 2



-G: General-purpose, -H: Strong Edge, -F: Medium Finishing,
-P16/-P20/-P25: High-precision Machining, -S: Non-Ferrous Metals.

Recommended Cutting Conditions H58 Maximum Allowable Spindle Speed H59
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZ 17000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-4° to -9°
	Axial	10° to 15°

15mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

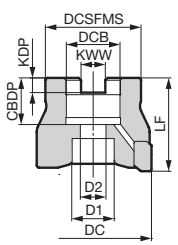


Fig 2

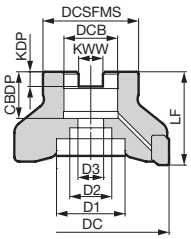


Fig 3

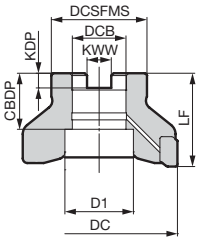


Fig 4

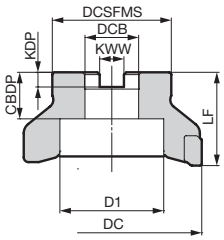
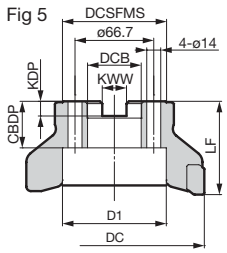


Fig 5



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Number of Teeth	Weight (kg)	Fig
Metric	**WEZ 17040RS03**	●	**40**	33	40(39.3)	**16**	8.4	5.6	18	14	9	—	3	0.19	1
	17040RS04	●	**40**	33	40(39.3)	**16**	8.4	5.6	18	14	9	—	4	0.16	1
	17050RS03	●	**50**	41	40(39.3)	**22**	10.4	6.3	20	18	11	—	3	0.30	1
	17050RS05	●	**50**	41	40(39.3)	**22**	10.4	6.3	20	18	11	—	5	0.26	1
	17063RS04	●	**63**	50	40(39.3)	**22**	10.4	6.3	20	18	11	—	4	0.54	1
	17063RS06	●	**63**	50	40(39.3)	**22**	10.4	6.3	20	18	11	—	6	0.51	1
	17080RS04	●	***80**	55	50(49.3)	**27**	12.4	7	22	20	14	—	4	1.10	1
	17080RS07	●	***80**	55	50(49.3)	**27**	12.4	7	22	20	14	—	7	1.05	1
	17100RS05	●	**100**	70	50(49.3)	**32**	14.4	8	32	46	—	—	5	1.58	3
	17100RS08	●	**100**	70	50(49.3)	**32**	14.4	8	32	46	—	—	8	1.57	3
	17125RS06	●	**125**	80	63(62.3)	**40**	16.4	9	29	52	29	—	6	3.04	1
	17125RS09	●	**125**	80	63(62.3)	**40**	16.4	9	29	52	29	—	9	3.07	1
	17125RS11	●	**125**	80	63(62.3)	**40**	16.4	9	29	52	29	—	11	3.02	1
	17160RS08	●	**160**	100	63(62.3)	**40**	16.4	9	29	90	—	—	8	5.24	5
	17160RS10	●	**160**	100	63(62.3)	**40**	16.4	9	29	90	—	—	10	5.31	5
	17160RS12	●	**160**	100	63(62.3)	**40**	16.4	9	29	90	—	—	12	5.26	5
Inch	**WEZ 17080R04**	●	***80**	55	50(49.3)	**25.4**	9.5	6	25	20	14	—	4	1.10	1
	17080R07	●	***80**	55	50(49.3)	**25.4**	9.5	6	25	20	14	—	7	1.06	1
	17100R05	●	***100**	70	63(62.3)	**31.75**	12.7	8	32	46	27	18	5	2.08	2
	17100R08	●	***100**	70	63(62.3)	**31.75**	12.7	8	32	46	27	18	8	2.07	2
	17125R06	●	**125**	80	63(62.3)	**38.1**	15.9	10	35.5	55	30	—	6	3.09	1
	17125R09	●	**125**	80	63(62.3)	**38.1**	15.9	10	35.5	55	30	—	9	3.11	1
	17125R11	●	**125**	80	63(62.3)	**38.1**	15.9	10	35.5	55	30	—	11	3.06	1
	17160R08	●	**160**	100	63(62.3)	**50.8**	19.1	11	38	72	—	—	8	5.04	4
	17160R10	●	**160**	100	63(62.3)	**50.8**	19.1	11	38	72	—	—	10	5.09	4
	17160R12	●	**160**	100	63(62.3)	**50.8**	19.1	11	38	72	—	—	12	5.04	4

The LF dimensions in parentheses are dimensions using RE = 5.0/6.4 insert. When using RE = 5.0/6.4 inserts, the maximum depth of cut is 14.5mm.
Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Parts

Applicable Cutter	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seizure Cream
		N·m		Handle Grip	Bit	
WEZ17040RS03	BFTX0409IP	3.0	—	HPS1015	TRB15IP	SUMI-P
WEZ17040RS04						
WEZ17050RS03						
WEZ17050RS05						
WEZ17063RS04						
WEZ17063RS06						
WEZ17080R(S)04						
WEZ17080R(S)07						
WEZ17100R(S)05						
WEZ17100R(S)08						
WEZ17125R(S)06						
WEZ17125R(S)09						
WEZ17125R(S)11						
WEZ17160R(S)08			TRDR15IP	—	—	
WEZ17160R(S)10						
WEZ17160R(S)12						

Identification Code

WEZ 17 100 R S 05

WEZ	17	100	R	S	05
Series Code	Insert Size	Dia.	Feed Direction	Metric Bore	Number of Teeth

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ17 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT170524PEER)
Corner radius = 3.0: C1.5
(AOMT170530PEER)
Corner radius = 3.2: C1.5
(AOMT170532PEER)
Corner radius = 4.0: C2
(AOMT170540PEER)
Corner radius = 5.0: C5
(AOMT170550PEER)
Corner radius = 6.4: C5
(AOMT170564PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m)

WEZ 17000R(S) type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		P M	P		K	K		M S		N	P		
	General-purpose	P M S	P M		P	K		K	M S	M S	N	N		
	Roughing	P M S			P			K		M S				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 170502PEER-L		●		—			—		●	●	—	—		0.2	1
170504PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.4	1
170508PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.8	1
170512PEER-L		●		—			—		●	●	—	—		1.2	1
170516PEER-L		●		—			—		●	●	—	—		1.6	1
AOMT 170502PEER-G		●	●		●	●		●	●	●	—	—		0.2	1
170504PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
170505PEER-G		●							●	●	—	—		0.5	1
170508PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
170510PEER-G		●							●	●	—	—		1.0	1
170512PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
170516PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
170520PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
170524PEER-G		●							●	●	—	—		2.4	1
170530PEER-G		●	●		●	●		●	●	●	—	—		3.0	1
170532PEER-G		●	●		●	●		●	●	●	—	—		3.2	1
170540PEER-G		●	●		●	●		●	●	●	—	—		4.0	1
170550PEER-G		●	●		●	●		●	●	●	—	—		5.0	2
170564PEER-G		●							●	●	—	—		6.4	2
AOMT 170504PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
170508PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
170512PEER-H		●							●	●	—	—	—	1.2	1
170516PEER-H		●							●	●	—	—	—	1.6	1
AOET 170502PEER-F		●		—			—		—		—	—	—	0.2	1
170504PEER-F		●		—			—		—		—	—	—	0.4	1
170505PEER-F		●		—			—		—		—	—	—	0.5	1
170508PEER-F		●		—			—		—		—	—	—	0.8	1
170510PEER-F		●		—			—		—		—	—	—	1.0	1
170512PEER-F		●		—			—		—		—	—	—	1.2	1
170516PEER-F		●		—			—		—		—	—	—	1.6	1
170520PEER-F		●		—			—		—		—	—	—	2.0	1
170524PEER-F		●		—			—		—		—	—	—	2.4	1
170530PEER-F		●		—			—		—		—	—	—	3.0	1
170532PEER-F		●		—			—		—		—	—	—	3.2	1
170540PEER-F		●		—			—		—		—	—	—	4.0	1
170550PEER-F		●		—			—		—		—	—	—	5.0	2
170564PEER-F		●		—			—		—		—	—	—	6.4	2
AOET 170502PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
170505PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
170508PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
170510PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
170512PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
170516PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
170520PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
170524PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
170530PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	1
170532PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	1
170540PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	4.0	1
170550PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	5.0	2
170564PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	6.4	2

Fig 1

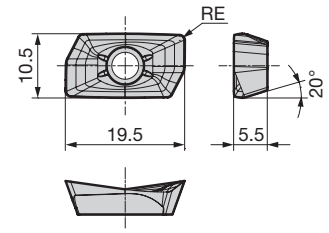
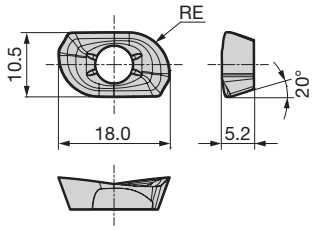


Fig 2



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge,
-F: Medium Finishing, -S: Non-Ferrous Metals.

Recommended Cutting Conditions H58 Maximum Allowable Spindle Speed H59
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZ 11000E type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-7° to -18°
	Axial	6° to 15°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

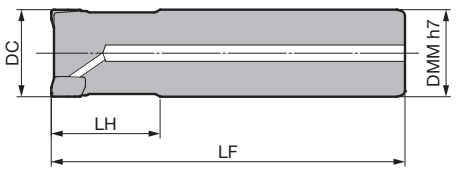
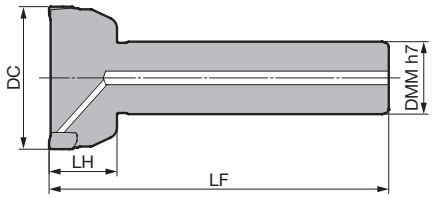


Fig 2



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEZ 11014E01	●	**14**	16	25(24.7)	80(79.7)	1	0.10	1
11016E02	●	**16**	16	25(24.7)	100(99.7)	2	0.13	1
11016E02-12	●	**16**	12	25(24.7)	100(99.7)	2	0.07	2
11018E02	●	**18**	16	25(24.7)	100(99.7)	2	0.13	2
11020E02	●	**20**	20	30(29.7)	110(109.7)	2	0.23	1
11020E02-16	●	**20**	16	30(29.7)	110(109.7)	2	0.15	2
11020E03	●	**20**	20	30(29.7)	110(109.7)	3	0.22	1
11020E03-16	●	**20**	16	30(29.7)	110(109.7)	3	0.14	2
11022E03	●	**22**	20	30(29.7)	110(109.7)	3	0.23	2
11025E02	●	**25**	25	35(34.7)	120(119.7)	2	0.40	1
11025E03	●	**25**	25	35(34.7)	120(119.7)	3	0.40	1
11025E03-20	●	**25**	20	35(34.7)	120(119.7)	3	0.26	2
11025E04	●	**25**	25	35(34.7)	120(119.7)	4	0.39	1
11025E04-20	●	**25**	20	35(34.7)	120(119.7)	4	0.26	2
11028E04	●	**28**	25	35(34.7)	120(119.7)	4	0.41	2
11030E04	●	**30**	25	40(39.7)	130(129.7)	4	0.46	2
11032E02	●	**32**	32	40(39.7)	130(129.7)	2	0.74	1
11032E03	●	**32**	32	40(39.7)	130(129.7)	3	0.73	1
11032E04	●	**32**	32	40(39.7)	130(129.7)	4	0.73	1
11032E05	●	**32**	32	40(39.7)	130(129.7)	5	0.72	1
11032E05-25	●	**32**	25	40(39.7)	130(129.7)	5	0.46	2
11035E05	●	**35**	32	40(39.7)	130(129.7)	5	0.75	2
11040E02	●	**40**	32	30(29.7)	150(149.7)	2	0.96	2
11040E04	●	**40**	32	30(29.7)	150(149.7)	4	0.94	2
11040E06	●	**40**	32	30(29.7)	150(149.7)	6	0.93	2
11050E05	●	**50**	32	30(29.7)	150(149.7)	5	1.04	2
11050E07	●	**50**	32	30(29.7)	150(149.7)	7	1.04	2
11063E08	●	**63**	32	30(29.7)	150(149.7)	8	1.24	2
11080E10	●	**80**	32	30(29.7)	150(149.7)	10	1.52	2

The LH and LF dimensions in parentheses are dimensions using RE = 3.0/3.2 insert. When using RE = 3.0/3.2 inserts, the maximum depth of cut is 9.5mm.
Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Integrated Wrench	Anti-seizure Cream
WEZ11014E01	BFTX0305IP	1.5	TRDR08IP	SUMI-P
WEZ11016E02(-12)				
WEZ11018E02				
WEZ11020E02(-16)	BFTX0306IP			
WEZ11020E03(-16)				
WEZ11022E03				
WEZ11025E02				
WEZ11025E03(-20)				
WEZ11025E04(-20)				
WEZ11028E04				
WEZ11030E04				
WEZ11032E02				
WEZ11032E03				
WEZ11032E04				
WEZ11032E05(-25)				
WEZ11035E05				
WEZ11040E02				
WEZ11040E04				
WEZ11040E06				
WEZ11050E05				
WEZ11050E07				
WEZ11063E08				
WEZ11080E10				

Identification Code

WEZ Series Code | **11** Insert Size | **025** Dia. | **E** Shank type | **03** Number of Teeth | **-20** Shank Dia.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ11 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT11T324PEER)
Corner radius = 3.0: C2.5
(AOMT11T330PEER)
Corner radius = 3.2: C2.5
(AOMT11T332PEER)
Standard: R1.

N·m Recommended Tightening Torque (N·m)

WEZ 11000E type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		PKM	P		K	K		MS		N	P		
	General-purpose	PKS	PKM		P	K		K	MS	MS	N	N		
	Roughing	PKS			P			K		MS				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 11T302PEER-G		●	●		●	●		●	●	●	—	—	●	0.2	1
11T304PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
11T305PEER-G		●							●	●	—	—		0.5	1
11T308PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
11T310PEER-G		●							●	●	—	—		1.0	1
11T312PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
11T316PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
11T320PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
11T324PEER-G		●							●	●	—	—		2.4	1
11T330PEER-G		●	●		●	●		●	●	●	—	—		3.0	2
11T332PEER-G		●							●	●	—	—		3.2	2
AOMT 11T304PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
11T308PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
11T312PEER-H		●							●	●	—	—	—	1.2	1
11T316PEER-H		●							●	●	—	—	—	1.6	1
AOET 11T302PEER-F		●		—			—		—		—	—	—	0.2	1
11T304PEER-F		●		—			—		—		—	—	—	0.4	1
11T305PEER-F		●		—			—		—		—	—	—	0.5	1
11T308PEER-F		●		—			—		—		—	—	—	0.8	1
11T310PEER-F		●		—			—		—		—	—	—	1.0	1
11T312PEER-F		●		—			—		—		—	—	—	1.2	1
11T316PEER-F		●		—			—		—		—	—	—	1.6	1
11T320PEER-F		●		—			—		—		—	—	—	2.0	1
11T324PEER-F		●		—			—		—		—	—	—	2.4	1
11T330PEER-F		●		—			—		—		—	—	—	3.0	2
11T332PEER-F		●		—			—		—		—	—	—	3.2	2
AOET 11T302PEER-P16		●		—			—		—		—	—	—	0.2	1
11T304PEER-P16		●		—			—		—		—	—	—	0.4	1
11T305PEER-P16		●		—			—		—		—	—	—	0.5	1
11T308PEER-P16		●		—			—		—		—	—	—	0.8	1
11T310PEER-P16		●		—			—		—		—	—	—	1.0	1
11T312PEER-P16		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEER-P20		●		—			—		—		—	—	—	0.2	1
11T304PEER-P20		●		—			—		—		—	—	—	0.4	1
11T305PEER-P20		●		—			—		—		—	—	—	0.5	1
11T308PEER-P20		●		—			—		—		—	—	—	0.8	1
11T310PEER-P20		●		—			—		—		—	—	—	1.0	1
11T312PEER-P20		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEER-P25		●		—			—		—		—	—	—	0.2	1
11T304PEER-P25		●		—			—		—		—	—	—	0.4	1
11T305PEER-P25		●		—			—		—		—	—	—	0.5	1
11T308PEER-P25		●		—			—		—		—	—	—	0.8	1
11T310PEER-P25		●		—			—		—		—	—	—	1.0	1
11T312PEER-P25		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
11T304PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
11T305PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
11T308PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
11T310PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
11T312PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
11T316PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
11T320PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
11T324PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
11T330PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	2
11T332PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	2

Fig 1

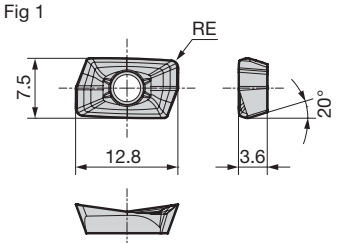
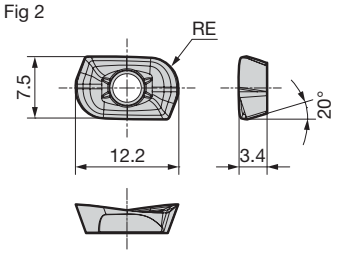


Fig 2



-G: General-purpose, -H: Strong Edge, -F: Medium Finishing,
-P16/-P20/-P25: High-precision Machining, -S: Non-Ferrous Metals.

* -P16 is applicable to cutter diameters ø14 and ø16. -P20 is applicable to cutter diameters ø18 and ø20.
-P25 is applicable to cutter diameters ø25 and ø28.

Recommended Cutting Conditions H58 Maximum Allowable Spindle Speed H59
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZ 11000ES Series for Multi-tasking Machines

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-14° to -18°
	Axial	6° to 10°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

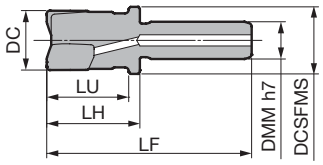
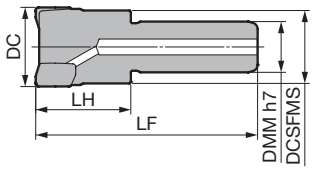


Fig 2



Body (Short Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Boss DCSFMS	Shank DMM	Head LH	Effective Length LU	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEZ 11014ES01-12	●	**14**	18	12	30(29.7)	27	65(64.7)	1	0.05	1
11016ES02-10	●	**16**	18	10	25(24.7)	22	55(54.7)	2	0.04	1
11016ES02-12	●	**16**	18	12	30(29.7)	27	65(64.7)	2	0.05	1
11020ES03-10	●	**20**	18	10	25(24.7)	—	55(54.7)	3	0.04	2
11020ES03-12	●	**20**	18	12	30(29.7)	—	65(64.7)	3	0.06	2
11020ES03-16	●	**20**	23	16	30(29.7)	27	70(69.7)	3	0.10	1
11025ES04-12	●	**25**	23	12	30(29.7)	—	65(64.7)	4	0.09	2
11025ES04-16	●	**25**	23	16	30(29.7)	—	70(69.7)	4	0.12	2

The LH and LF dimensions in parentheses are dimensions using RE = 3.0/3.2 insert. When using RE = 3.0/3.2 inserts, the maximum depth of cut is 9.5mm.
Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEZ11014ES01-12	BFTX0305IP	1.5	TRDR08IP	SUMI-P
WEZ11016ES02-10				
WEZ11016ES02-12				
WEZ11020ES03-10	BFTX0306IP			
WEZ11020ES03-12				
WEZ11020ES03-16				
WEZ11025ES04-12				
WEZ11025ES04-16				

Identification Code

WEZ	11	020	E	S	03	-12
Series Code	Insert Size	Dia.	Shank type	Short Shank	Number of Teeth	Shank Dia.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

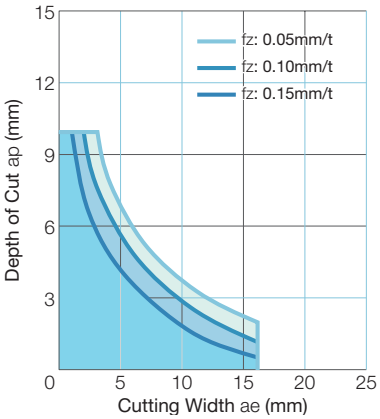
WEZ11 type

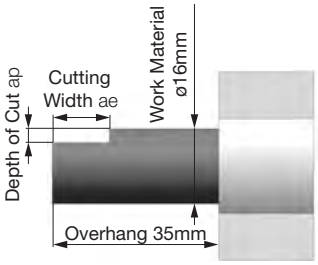
Reworking guidelines
Corner radius = 2.4: C1
(AOMT11T324PEER)
Corner radius = 3.0: C2.5
(AOMT11T330PEER)
Corner radius = 3.2: C2.5
(AOMT11T332PEER)

Standard: R1.

Recommended Cutting Conditions

Tool: WEZ11016ES02-10
Insert: AOET11T3○○PEER-F





·For cutting conditions for each work material, see H58.
· The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).

N·m Recommended Tightening Torque (N·m)

WEZ 11000ES Series for Multi-tasking Machines

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		P M	P		K	K		M S		N	P		
	General-purpose	P K M S	P M		P	K		K	M S	M S	N	N		
	Roughing	P K M S			P			K		M S				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 11T302PEER-G		●	●		●	●		●	●	●	—	—	●	0.2	1
11T304PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
11T305PEER-G		●							●	●	—	—		0.5	1
11T308PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
11T310PEER-G		●							●	●	—	—		1.0	1
11T312PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
11T316PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
11T320PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
11T324PEER-G		●							●	●	—	—		2.4	1
11T330PEER-G		●	●		●	●		●	●	●	—	—		3.0	2
11T332PEER-G		●							●	●	—	—		3.2	2
AOMT 11T304PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
11T308PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
11T312PEER-H		●							●	●	—	—	—	1.2	1
11T316PEER-H		●							●	●	—	—	—	1.6	1
AOET 11T302PEER-F		●		—			—		—		—	—	—	0.2	1
11T304PEER-F		●		—			—		—		—	—	—	0.4	1
11T305PEER-F		●		—			—		—		—	—	—	0.5	1
11T308PEER-F		●		—			—		—		—	—	—	0.8	1
11T310PEER-F		●		—			—		—		—	—	—	1.0	1
11T312PEER-F		●		—			—		—		—	—	—	1.2	1
11T316PEER-F		●		—			—		—		—	—	—	1.6	1
11T320PEER-F		●		—			—		—		—	—	—	2.0	1
11T324PEER-F		●		—			—		—		—	—	—	2.4	1
11T330PEER-F		●		—			—		—		—	—	—	3.0	2
11T332PEER-F		●		—			—		—		—	—	—	3.2	2
AOET 11T302PEER-P16		●		—			—		—		—	—	—	0.2	1
11T304PEER-P16		●		—			—		—		—	—	—	0.4	1
11T305PEER-P16		●		—			—		—		—	—	—	0.5	1
11T308PEER-P16		●		—			—		—		—	—	—	0.8	1
11T310PEER-P16		●		—			—		—		—	—	—	1.0	1
11T312PEER-P16		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEER-P20		●		—			—		—		—	—	—	0.2	1
11T304PEER-P20		●		—			—		—		—	—	—	0.4	1
11T305PEER-P20		●		—			—		—		—	—	—	0.5	1
11T308PEER-P20		●		—			—		—		—	—	—	0.8	1
11T310PEER-P20		●		—			—		—		—	—	—	1.0	1
11T312PEER-P20		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEER-P25		●		—			—		—		—	—	—	0.2	1
11T304PEER-P25		●		—			—		—		—	—	—	0.4	1
11T305PEER-P25		●		—			—		—		—	—	—	0.5	1
11T308PEER-P25		●		—			—		—		—	—	—	0.8	1
11T310PEER-P25		●		—			—		—		—	—	—	1.0	1
11T312PEER-P25		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
11T304PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
11T305PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
11T308PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
11T310PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
11T312PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
11T316PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
11T320PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
11T324PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
11T330PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	2
11T332PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	2

Fig 1

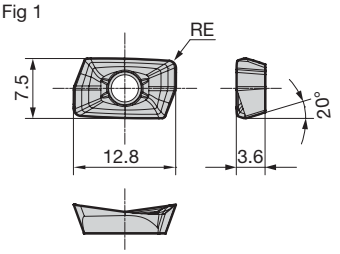
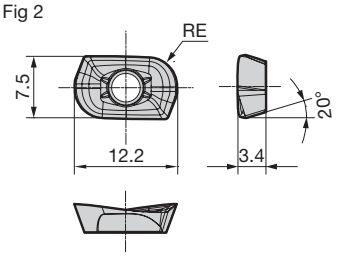


Fig 2



-G: General-purpose, -H: Strong Edge, -F: Medium Finishing,
-P16/-P20/-P25: High-precision Machining, -S: Non-Ferrous Metals.
* -P16 is applicable to cutter diameters ø14 and ø16. -P20 is applicable to cutter diameters ø18 and ø20.
-P25 is applicable to cutter diameters ø25 and ø28.

Recommended Cutting Conditions H58 Maximum Allowable Spindle Speed H59
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZ 11000EL type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-7° to -18°
	Axial	6° to 15°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

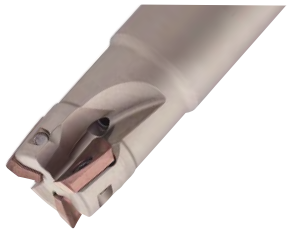


Fig 1

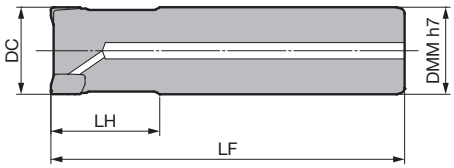
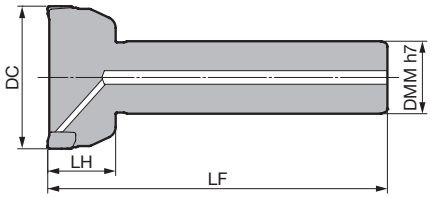


Fig 2



Body (Long Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEZ 11014EL01	●	**14**	16	25(24.7)	120(119.7)	1	0.16	1
11016EL02	●	**16**	16	25(24.7)	145(144.7)	2	0.19	1
11016EL02-14	●	**16**	14	25(24.7)	145(144.7)	2	0.15	2
11018EL02	●	**18**	16	25(24.7)	145(144.7)	2	0.20	2
11020EL02	●	**20**	20	40(39.7)	150(149.7)	2	0.31	1
11020EL02-18	●	**20**	18	25(24.7)	150(149.7)	2	0.26	2
11022EL02	●	**22**	20	30(29.7)	150(149.7)	2	0.32	2
11025EL02	●	**25**	25	50(49.7)	170(169.7)	2	0.57	1
11025EL02-22	●	**25**	22	30(29.7)	170(169.7)	2	0.46	2
11025EL03	●	**25**	25	50(49.7)	170(169.7)	3	0.57	1
11028EL02	●	**28**	25	30(29.7)	170(169.7)	2	0.60	2
11030EL02	●	**30**	25	30(29.7)	170(169.7)	2	0.62	2
11032EL02	●	**32**	32	60(59.7)	170(169.7)	2	0.97	1
11032EL02-30	●	**32**	30	30(29.7)	170(169.7)	2	0.88	2
11032EL03	●	**32**	32	60(59.7)	170(169.7)	3	0.96	1
11035EL02	●	**35**	32	30(29.7)	170(169.7)	2	1.02	2
11035EL03	●	**35**	32	30(29.7)	170(169.7)	3	1.00	2
11040EL02	●	**40**	32	30(29.7)	170(169.7)	2	1.08	2
11050EL03	●	**50**	32	30(29.7)	170(169.7)	3	1.19	2

The LH and LF dimensions in parentheses are dimensions using RE = 3.0/3.2 insert. When using RE = 3.0/3.2 inserts, the maximum depth of cut is 9.5mm.
Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEZ11014EL01	BFTX0305IP	1.5	TRDR08IP	SUMI-P
WEZ11016EL02(-14)				
WEZ11018EL02				
WEZ11020EL02(-18)	BFTX0306IP			
WEZ11022EL02				
WEZ11025EL02(-22)				
WEZ11025EL03				
WEZ11028EL02				
WEZ11030EL02				
WEZ11032EL02(-30)				
WEZ11032EL03				
WEZ11035EL02				
WEZ11035EL03				
WEZ11040EL02				
WEZ11050EL03				

Identification Code

WEZ Series Code | **11** Insert Size | **025** Dia. | **E** Shank type | **L** Long Shank | **02** Number of Teeth | **-22** Shank Dia.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ11 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT11T324PEER)
Corner radius = 3.0: C2.5
(AOMT11T330PEER)
Corner radius = 3.2: C2.5
(AOMT11T332PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m)

WEZ 11000EL type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		P M K	P		K	K		M S		N	P		
	General-purpose	P M K S	P M K		P	K		K	M S	M S	N	N		
	Roughing	P M K S			P			K		M S				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 11T302PEER-G		●	●		●	●		●	●	●	—	—	●	0.2	1
11T304PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
11T305PEER-G		●							●	●	—	—		0.5	1
11T308PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
11T310PEER-G		●							●	●	—	—		1.0	1
11T312PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
11T316PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
11T320PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
11T324PEER-G		●							●	●	—	—		2.4	1
11T330PEER-G		●	●		●	●		●	●	●	—	—		3.0	2
11T332PEER-G		●							●	●	—	—		3.2	2
AOMT 11T304PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
11T308PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
11T312PEER-H		●							●	●	—	—	—	1.2	1
11T316PEER-H		●							●	●	—	—	—	1.6	1
AOET 11T302PEER-F		●		—			—		—		—	—	—	0.2	1
11T304PEER-F		●		—			—		—		—	—	—	0.4	1
11T305PEER-F		●		—			—		—		—	—	—	0.5	1
11T308PEER-F		●		—			—		—		—	—	—	0.8	1
11T310PEER-F		●		—			—		—		—	—	—	1.0	1
11T312PEER-F		●		—			—		—		—	—	—	1.2	1
11T316PEER-F		●		—			—		—		—	—	—	1.6	1
11T320PEER-F		●		—			—		—		—	—	—	2.0	1
11T324PEER-F		●		—			—		—		—	—	—	2.4	1
11T330PEER-F		●		—			—		—		—	—	—	3.0	2
11T332PEER-F		●		—			—		—		—	—	—	3.2	2
AOET 11T302PEER-P16		●		—			—		—		—	—	—	0.2	1
11T304PEER-P16		●		—			—		—		—	—	—	0.4	1
11T305PEER-P16		●		—			—		—		—	—	—	0.5	1
11T308PEER-P16		●		—			—		—		—	—	—	0.8	1
11T310PEER-P16		●		—			—		—		—	—	—	1.0	1
11T312PEER-P16		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEER-P20		●		—			—		—		—	—	—	0.2	1
11T304PEER-P20		●		—			—		—		—	—	—	0.4	1
11T305PEER-P20		●		—			—		—		—	—	—	0.5	1
11T308PEER-P20		●		—			—		—		—	—	—	0.8	1
11T310PEER-P20		●		—			—		—		—	—	—	1.0	1
11T312PEER-P20		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEER-P25		●		—			—		—		—	—	—	0.2	1
11T304PEER-P25		●		—			—		—		—	—	—	0.4	1
11T305PEER-P25		●		—			—		—		—	—	—	0.5	1
11T308PEER-P25		●		—			—		—		—	—	—	0.8	1
11T310PEER-P25		●		—			—		—		—	—	—	1.0	1
11T312PEER-P25		●		—			—		—		—	—	—	1.2	1
AOET 11T302PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
11T304PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
11T305PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
11T308PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
11T310PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
11T312PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
11T316PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
11T320PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
11T324PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
11T330PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	2
11T332PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	2

Fig 1

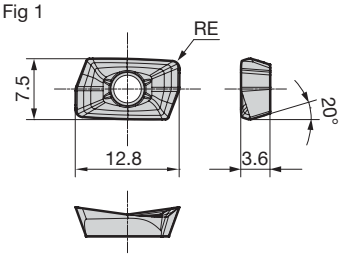
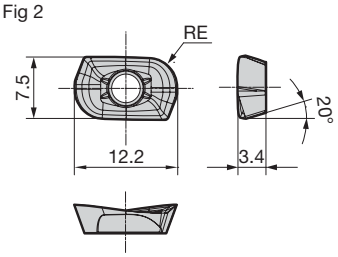


Fig 2



-G: General-purpose, -H: Strong Edge, -F: Medium Finishing,
-P16/-P20/-P25: High-precision Machining, -S: Non-Ferrous Metals.
* -P16 is applicable to cutter diameters ø14 and ø16. -P20 is applicable to cutter diameters ø18 and ø20.
-P25 is applicable to cutter diameters ø25 and ø28.

Recommended Cutting Conditions H58 Maximum Allowable Spindle Speed H59
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZ 17000E type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-6° to -12°
	Axial	6° to 15°

15mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

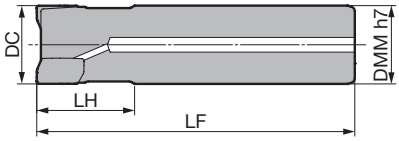
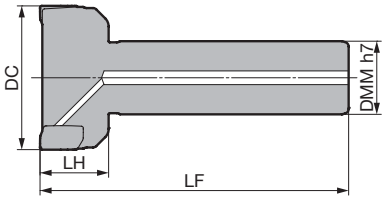


Fig 2



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEZ 17025E02	●	**25**	25	35(34.3)	120(119.3)	2	0.38	1
17025E02-20	●	**25**	20	35(34.3)	120(119.3)	2	0.25	2
17028E02	●	**28**	25	35(34.3)	120(119.3)	2	0.40	2
17030E03	●	**30**	25	40(39.3)	130(129.3)	3	0.43	2
17032E02	●	**32**	32	40(39.3)	130(129.3)	2	0.71	1
17032E03	●	**32**	32	40(39.3)	130(129.3)	3	0.69	1
17032E03-25	●	**32**	25	40(39.3)	130(129.3)	3	0.44	2
17035E03	●	**35**	32	40(39.3)	130(129.3)	3	0.72	2
17040E03	●	**40**	32	30(29.3)	135(134.3)	3	0.81	2
17040E04	●	**40**	32	30(29.3)	135(134.3)	4	0.79	2
17050E03	●	**50**	32	30(29.3)	135(134.3)	3	0.93	2
17050E03-42	●	**50**	42	30(29.3)	135(134.3)	3	1.41	2
17050E05	●	**50**	32	30(29.3)	135(134.3)	5	0.89	2
17050E05-42	●	**50**	42	30(29.3)	135(134.3)	5	1.37	2
17063E04	●	**63**	32	30(29.3)	135(134.3)	4	1.10	2
17063E04-42	●	**63**	42	30(29.3)	135(134.3)	4	1.58	2
17063E06	●	**63**	32	30(29.3)	135(134.3)	6	1.08	2
17063E06-42	●	**63**	42	30(29.3)	135(134.3)	6	1.56	2
17080E07	●	**80**	32	30(29.3)	135(134.3)	7	1.39	2

The LH and LF dimensions in parentheses are dimensions using RE = 5.0/6.4 insert. When using RE = 5.0/6.4 inserts, the maximum depth of cut is 14.5mm.
Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEZ17025E02(-20)	BFTX0407IP	3.0	TRDR15IP	SUMI-P
WEZ17028E02				
WEZ17030E03				
WEZ17032E02	BFTX0409IP			
WEZ17032E03(-25)				
WEZ17035E03				
WEZ17040E03				
WEZ17040E04				
WEZ17050E03(-42)				
WEZ17050E05(-42)				
WEZ17063E04(-42)				
WEZ17063E06(-42)				
WEZ17080E07				

Identification Code

WEZ 17 025 E 02 -20

WEZ	17	025	E	02	-20
Series Code	Insert Size	Dia.	Shank type	Number of Teeth	Shank Dia.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ17 type

Reworking guidelines
Corner radius = 2.4: C1 (AOMT170524PEER)
Corner radius = 3.0: C1.5 (AOMT170530PEER)
Corner radius = 3.2: C1.5 (AOMT170532PEER)
Corner radius = 4.0: C2 (AOMT170540PEER)
Corner radius = 5.0: C5 (AOMT170550PEER)
Corner radius = 6.4: C5 (AOMT170564PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m)

WEZ 17000E type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		P M	P		K	K		M S		N	P		
	General-purpose	P K M S	P M		P	K		K	M S	M S	N	N		
	Roughing	P K M S			P			K		M S				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 170502PEER-L		●		—			—		●	●	—	—		0.2	1
170504PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.4	1
170508PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.8	1
170512PEER-L		●		—			—		●	●	—	—		1.2	1
170516PEER-L		●		—			—		●	●	—	—		1.6	1
AOMT 170502PEER-G		●	●		●	●		●	●	●	—	—		0.2	1
170504PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
170505PEER-G		●							●	●	—	—		0.5	1
170508PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
170510PEER-G		●							●	●	—	—		1.0	1
170512PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
170516PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
170520PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
170524PEER-G		●							●	●	—	—		2.4	1
170530PEER-G		●	●		●	●		●	●	●	—	—		3.0	1
170532PEER-G		●	●		●	●		●	●	●	—	—		3.2	1
170540PEER-G		●	●		●	●		●	●	●	—	—		4.0	1
170550PEER-G		●	●		●	●		●	●	●	—	—		5.0	2
170564PEER-G		●							●	●	—	—		6.4	2
AOMT 170504PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
170508PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
170512PEER-H		●							●	●	—	—	—	1.2	1
170516PEER-H		●							●	●	—	—	—	1.6	1
AOET 170502PEER-F		●		—			—		—		—	—	—	0.2	1
170504PEER-F		●		—			—		—		—	—	—	0.4	1
170505PEER-F		●		—			—		—		—	—	—	0.5	1
170508PEER-F		●		—			—		—		—	—	—	0.8	1
170510PEER-F		●		—			—		—		—	—	—	1.0	1
170512PEER-F		●		—			—		—		—	—	—	1.2	1
170516PEER-F		●		—			—		—		—	—	—	1.6	1
170520PEER-F		●		—			—		—		—	—	—	2.0	1
170524PEER-F		●		—			—		—		—	—	—	2.4	1
170530PEER-F		●		—			—		—		—	—	—	3.0	1
170532PEER-F		●		—			—		—		—	—	—	3.2	1
170540PEER-F		●		—			—		—		—	—	—	4.0	1
170550PEER-F		●		—			—		—		—	—	—	5.0	2
170564PEER-F		●		—			—		—		—	—	—	6.4	2
AOET 170502PEER-P25		●		—			—		—		—	—	—	0.2	1
170504PEER-P25		●		—			—		—		—	—	—	0.4	1
170505PEER-P25		●		—			—		—		—	—	—	0.5	1
170508PEER-P25		●		—			—		—		—	—	—	0.8	1
170510PEER-P25		●		—			—		—		—	—	—	1.0	1
170512PEER-P25		●		—			—		—		—	—	—	1.2	1
AOET 170502PEER-P32		●		—			—		—		—	—	—	0.2	1
170504PEER-P32		●		—			—		—		—	—	—	0.4	1
170505PEER-P32		●		—			—		—		—	—	—	0.5	1
170508PEER-P32		●		—			—		—		—	—	—	0.8	1
170510PEER-P32		●		—			—		—		—	—	—	1.0	1
170512PEER-P32		●		—			—		—		—	—	—	1.2	1
AOET 170502PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
170505PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
170508PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
170510PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
170512PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
170516PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
170520PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
170524PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
170530PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	1
170532PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	1
170540PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	4.0	1
170550PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	5.0	2
170564PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	6.4	2

Fig 1

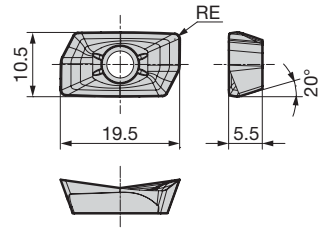
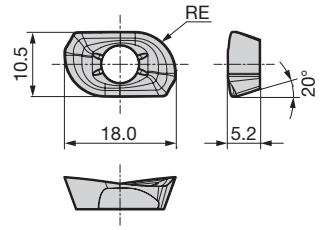


Fig 2



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge,
-F: Medium Finishing, -P25/-P32: High-precision Machining, -S: Non-Ferrous Metals.
* -P25 is applicable to cutter diameters ø25 and ø28. -P32 is applicable to cutter diameters ø30, ø32 and ø35.

Recommended Cutting Conditions H58 Maximum Allowable Spindle Speed H59
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZ 17000ES Series for Multi-tasking Machines

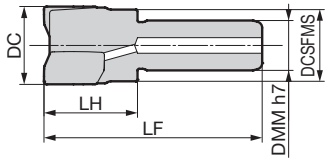
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	-10° to -12°
	Axial	6° to 8°

15mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1



Body (Short Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Boss DCSFMS	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEZ 17025ES02-16	●	**25**	23	16	30(29.3)	70(69.3)	2	0.11	1
17032ES03-16	●	**32**	27	16	30(29.3)	70(69.3)	3	0.14	1

The LH and LF dimensions in parentheses are dimensions using RE = 5.0/6.4 insert. When using RE = 5.0/6.4 inserts, the maximum depth of cut is 14.5mm.
Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEZ17025ES02-16	BFTX0407IP	3.0	TRDR15IP	SUMI-P
WEZ17032ES03-16	BFTX0409IP			

Identification Code

WEZ 17 025 E S 02 -16

WEZ	17	025	E	S	02	-16
Series Code	Insert Size	Dia.	Shank type	Short Shank	Number of Teeth	Shank Dia.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

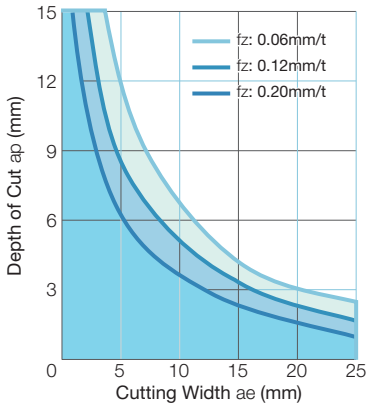
WEZ17 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT170524PEER)
Corner radius = 3.0: C1.5
(AOMT170530PEER)
Corner radius = 3.2: C1.5
(AOMT170532PEER)
Corner radius = 4.0: C2
(AOMT170540PEER)
Corner radius = 5.0: C5
(AOMT170550PEER)
Corner radius = 6.4: C5
(AOMT170564PEER)

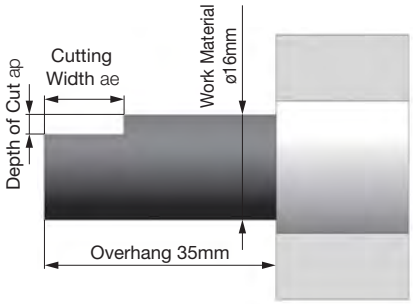
Standard: R1.

Recommended Cutting Conditions

Tool: WEZ17025ES02-16
Insert: AOET1705○○PEER-F



· For cutting conditions for each work material, see H58.
· The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).



N·m Recommended Tightening Torque (N·m)

WEZ 17000ES series for Multi-tasking Machines

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		PKM	P		K	K		MS		N	P		
	General-purpose	PKM	PKM		P	K		K	MS	MS	N	N		
	Roughing	PKM			P			K		MS				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 170502PEER-L		●		—			—		●	●	—	—		0.2	1
170504PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.4	1
170508PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.8	1
170512PEER-L		●		—			—		●	●	—	—		1.2	1
170516PEER-L		●		—			—		●	●	—	—		1.6	1
AOMT 170502PEER-G		●	●		●	●		●	●	●	—	—		0.2	1
170504PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
170505PEER-G		●							●	●	—	—		0.5	1
170508PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
170510PEER-G		●							●	●	—	—		1.0	1
170512PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
170516PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
170520PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
170524PEER-G		●							●	●	—	—		2.4	1
170530PEER-G		●	●		●	●		●	●	●	—	—		3.0	1
170532PEER-G		●	●		●	●		●	●	●	—	—		3.2	1
170540PEER-G		●	●		●	●		●	●	●	—	—		4.0	1
170550PEER-G		●	●		●	●		●	●	●	—	—		5.0	2
170564PEER-G		●							●	●	—	—		6.4	2
AOMT 170504PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
170508PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
170512PEER-H		●							●	●	—	—	—	1.2	1
170516PEER-H		●							●	●	—	—	—	1.6	1
AOET 170502PEER-F		●		—			—		—		—	—	—	0.2	1
170504PEER-F		●		—			—		—		—	—	—	0.4	1
170505PEER-F		●		—			—		—		—	—	—	0.5	1
170508PEER-F		●		—			—		—		—	—	—	0.8	1
170510PEER-F		●		—			—		—		—	—	—	1.0	1
170512PEER-F		●		—			—		—		—	—	—	1.2	1
170516PEER-F		●		—			—		—		—	—	—	1.6	1
170520PEER-F		●		—			—		—		—	—	—	2.0	1
170524PEER-F		●		—			—		—		—	—	—	2.4	1
170530PEER-F		●		—			—		—		—	—	—	3.0	1
170532PEER-F		●		—			—		—		—	—	—	3.2	1
170540PEER-F		●		—			—		—		—	—	—	4.0	1
170550PEER-F		●		—			—		—		—	—	—	5.0	2
170564PEER-F		●		—			—		—		—	—	—	6.4	2
AOET 170502PEER-P25		●		—			—		—		—	—	—	0.2	1
170504PEER-P25		●		—			—		—		—	—	—	0.4	1
170505PEER-P25		●		—			—		—		—	—	—	0.5	1
170508PEER-P25		●		—			—		—		—	—	—	0.8	1
170510PEER-P25		●		—			—		—		—	—	—	1.0	1
170512PEER-P25		●		—			—		—		—	—	—	1.2	1
AOET 170502PEER-P32		●		—			—		—		—	—	—	0.2	1
170504PEER-P32		●		—			—		—		—	—	—	0.4	1
170505PEER-P32		●		—			—		—		—	—	—	0.5	1
170508PEER-P32		●		—			—		—		—	—	—	0.8	1
170510PEER-P32		●		—			—		—		—	—	—	1.0	1
170512PEER-P32		●		—			—		—		—	—	—	1.2	1
AOET 170502PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
170505PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
170508PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
170510PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
170512PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
170516PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
170520PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
170524PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
170530PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	1
170532PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	1
170540PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	4.0	1
170550PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	5.0	2
170564PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	6.4	2

Fig 1

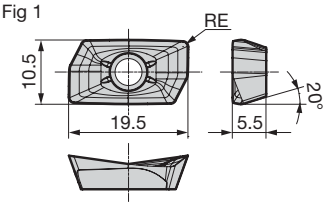
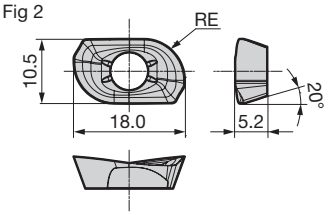


Fig 2



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge,
-F: Medium Finishing, -P25/-P32: High-precision Machining, -S: Non-Ferrous Metals.
* -P25 is applicable to cutter diameters ø25 and ø28. -P32 is applicable to cutter diameters ø30, ø32 and ø35.

Recommended Cutting Conditions ☞H58

● mark: Standard stocked item (new product/expanded item)

WEZ 17000EL type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-6° to -12°
	Axial	6° to 15°

15mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

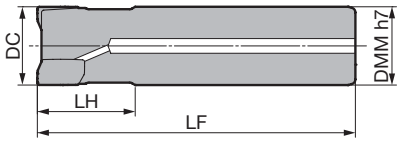
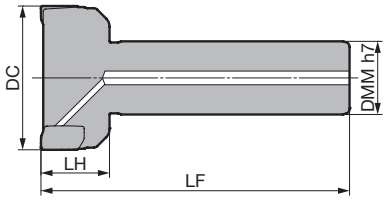


Fig 2



Body (Long Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEZ 17025EL02	●	**25**	25	50(49.3)	170(169.3)	2	0.55	1
17028EL02	●	**28**	25	50(49.3)	170(169.3)	2	0.57	2
17030EL02	●	**30**	25	50(49.3)	170(169.3)	2	0.59	2
17032EL02	●	**32**	32	60(59.3)	170(169.3)	2	0.94	1
17032EL02-30	●	**32**	30	50(49.3)	170(169.3)	2	0.85	2
17032EL03	●	**32**	32	60(59.3)	170(169.3)	3	0.92	1
17035EL02	●	**35**	32	50(49.3)	170(169.3)	2	0.98	2
17040EL02	●	**40**	32	50(49.3)	170(169.3)	2	1.09	2
17040EL03	●	**40**	32	50(49.3)	170(169.3)	3	1.08	2
17040EL04	●	**40**	32	50(49.3)	170(169.3)	4	1.05	2
17050EL03	●	**50**	32	50(49.3)	170(169.3)	3	1.29	2
17050EL03-42	●	**50**	42	50(49.3)	170(169.3)	3	1.83	2
17050EL05	●	**50**	32	50(49.3)	170(169.3)	5	1.25	2
17050EL05-42	●	**50**	42	50(49.3)	170(169.3)	5	1.79	2
17063EL04	●	**63**	32	50(49.3)	170(169.3)	4	1.61	2
17063EL04-42	●	**63**	42	50(49.3)	170(169.3)	4	2.16	2
17063EL06	●	**63**	32	50(49.3)	170(169.3)	6	1.58	2
17063EL06-42	●	**63**	42	50(49.3)	170(169.3)	6	2.13	2

The LH and LF dimensions in parentheses are dimensions using RE = 5.0/6.4 insert. When using RE = 5.0/6.4 inserts, the maximum depth of cut is 14.5mm.
Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEZ17025EL02	BFTX0407IP	3.0	TRDR15IP	SUMI-P
WEZ17028EL02				
WEZ17030EL02				
WEZ17032EL02(-30)	BFTX0409IP			
WEZ17032EL03				
WEZ17035EL02				
WEZ17040EL02				
WEZ17040EL03				
WEZ17040EL04				
WEZ17050EL03(-42)				
WEZ17050EL05(-42)				
WEZ17063EL04(-42)				
WEZ17063EL06(-42)				

Identification Code

WEZ 17 032 E L 02 -30

WEZ	17	032	E	L	02	-30
Series Code	Insert Size	Dia.	Shank type	Long Shank	Number of Teeth	Shank Dia.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ17 type

Reworking guidelines
Corner radius = 2.4: C1 (AOMT170524PEER)
Corner radius = 3.0: C1.5 (AOMT170530PEER)
Corner radius = 3.2: C1.5 (AOMT170532PEER)
Corner radius = 4.0: C2 (AOMT170540PEER)
Corner radius = 5.0: C5 (AOMT170550PEER)
Corner radius = 6.4: C5 (AOMT170564PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m)

WEZ 17000EL type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		P M	P		K	K		M S		N	P		
	General-purpose	P K M S	P M		P	K		K	M S	M S	N	N		
	Roughing	P K M S			P			K		M S				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 170502PEER-L		●		—			—		●	●	—	—		0.2	1
170504PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.4	1
170508PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.8	1
170512PEER-L		●		—			—		●	●	—	—		1.2	1
170516PEER-L		●		—			—		●	●	—	—		1.6	1
AOMT 170502PEER-G		●	●		●	●		●	●	●	—	—		0.2	1
170504PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
170505PEER-G		●							●	●	—	—		0.5	1
170508PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
170510PEER-G		●							●	●	—	—		1.0	1
170512PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
170516PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
170520PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
170524PEER-G		●							●	●	—	—		2.4	1
170530PEER-G		●	●		●	●		●	●	●	—	—		3.0	1
170532PEER-G		●	●		●	●		●	●	●	—	—		3.2	1
170540PEER-G		●	●		●	●		●	●	●	—	—		4.0	1
170550PEER-G		●	●		●	●		●	●	●	—	—		5.0	2
170564PEER-G		●							●	●	—	—		6.4	2
AOMT 170504PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
170508PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
170512PEER-H		●							●	●	—	—	—	1.2	1
170516PEER-H		●							●	●	—	—	—	1.6	1
AOET 170502PEER-F		●		—			—		—		—	—	—	0.2	1
170504PEER-F		●		—			—		—		—	—	—	0.4	1
170505PEER-F		●		—			—		—		—	—	—	0.5	1
170508PEER-F		●		—			—		—		—	—	—	0.8	1
170510PEER-F		●		—			—		—		—	—	—	1.0	1
170512PEER-F		●		—			—		—		—	—	—	1.2	1
170516PEER-F		●		—			—		—		—	—	—	1.6	1
170520PEER-F		●		—			—		—		—	—	—	2.0	1
170524PEER-F		●		—			—		—		—	—	—	2.4	1
170530PEER-F		●		—			—		—		—	—	—	3.0	1
170532PEER-F		●		—			—		—		—	—	—	3.2	1
170540PEER-F		●		—			—		—		—	—	—	4.0	1
170550PEER-F		●		—			—		—		—	—	—	5.0	2
170564PEER-F		●		—			—		—		—	—	—	6.4	2
AOET 170502PEER-P25		●		—			—		—		—	—	—	0.2	1
170504PEER-P25		●		—			—		—		—	—	—	0.4	1
170505PEER-P25		●		—			—		—		—	—	—	0.5	1
170508PEER-P25		●		—			—		—		—	—	—	0.8	1
170510PEER-P25		●		—			—		—		—	—	—	1.0	1
170512PEER-P25		●		—			—		—		—	—	—	1.2	1
AOET 170502PEER-P32		●		—			—		—		—	—	—	0.2	1
170504PEER-P32		●		—			—		—		—	—	—	0.4	1
170505PEER-P32		●		—			—		—		—	—	—	0.5	1
170508PEER-P32		●		—			—		—		—	—	—	0.8	1
170510PEER-P32		●		—			—		—		—	—	—	1.0	1
170512PEER-P32		●		—			—		—		—	—	—	1.2	1
AOET 170502PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
170505PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
170508PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
170510PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
170512PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
170516PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
170520PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
170524PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
170530PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	1
170532PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	1
170540PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	4.0	1
170550PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	5.0	2
170564PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	6.4	2

Fig 1

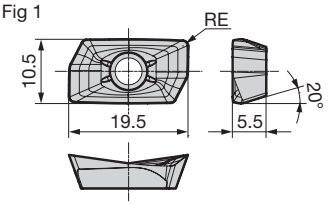
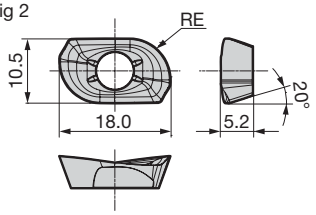


Fig 2



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge,
-F: Medium Finishing, -P25/-P32: High-precision Machining, -S: Non-Ferrous Metals.
* -P25 is applicable to cutter diameters ø25 and ø28. -P32 is applicable to cutter diameters ø30, ø32 and ø35.

Recommended Cutting Conditions ☞ H58

● mark: Standard stocked item (new product/expanded item)

WEZR series

New

■ Features

● **High-efficiency shoulder milling of deep steps**
Inserts for SEC-WaveMill WEZ series are arranged in multiple stages forming a long cutting edge, to enable high-efficiency shoulder milling of deep steps

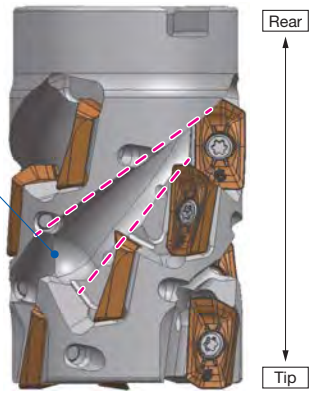
● **Superb chatter resistance**
Sharp inserts and irregular pitched body help suppress chatter and vibration

● **Support for all types of work materials**
A lineup of grades specific to each work material, as well as the general-purpose ACU2500 grade, which is applicable to steel, stainless steel and cast iron

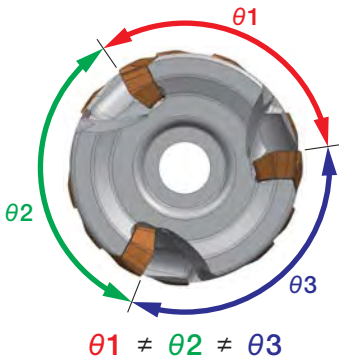
■ Body Features

● **Flute shape ensures both rigidity and excellent chip evacuation performance**

The chip pocket is larger toward the tip and the body is thicker toward the rear, for excellent chip evacuation and rigidity



● **Irregular pitched body suppresses chattering**



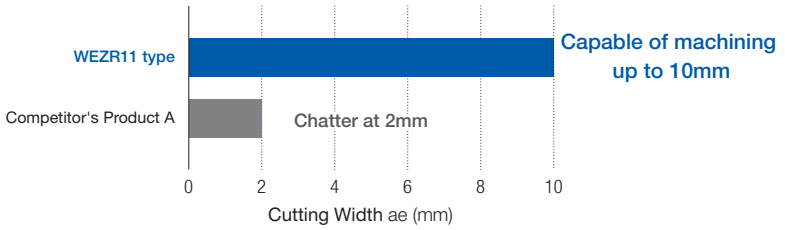
Irregular pitch is used to improve chatter resistance

■ Cutting Performance

● **Sharp inserts and irregular pitched body provide superb chatter resistance**

Capable of stable machining even with BT40 spindle machines

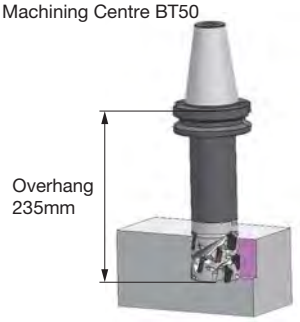
Vertical Machining Centre BT40

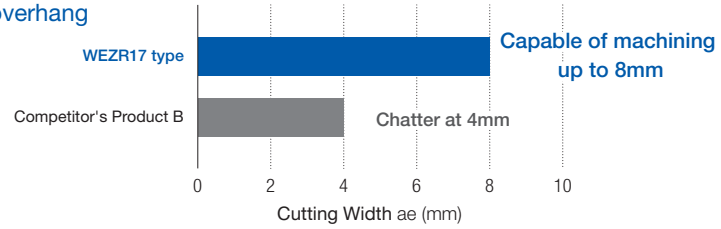


Machine	: Vertical Machining Centre BT40, Work Material: S50C, Overhang Amount: 60mm
Tool	: WEZR 11032E3632Z03 (ø32, 3-tooth 4-stage)
Insert	: AOMT 11T308PEER-G (ACU2500)
Cutting Conditions	: vc = 150m/min, fz = 0.1mm/t, ap = 30mm, Dry

Capable of stable machining even with a long overhang

Vertical Machining Centre BT50

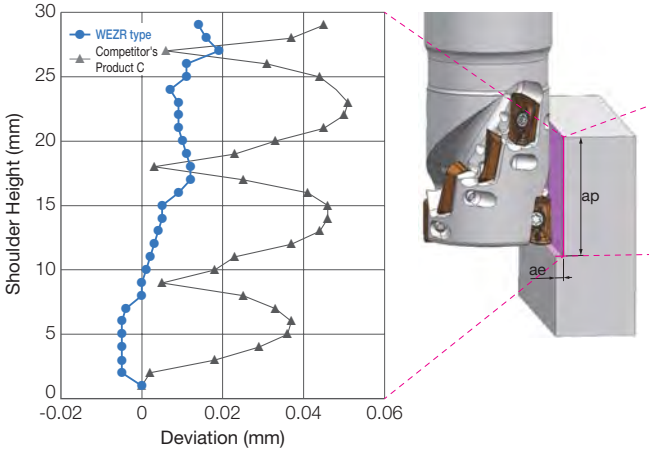


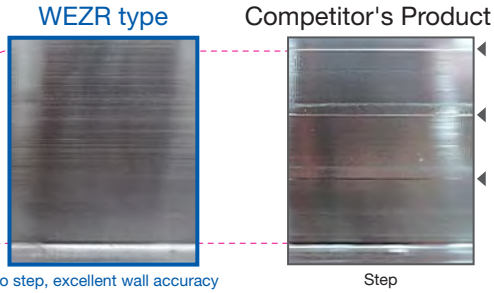


Machine	: Vertical Machining Centre BT50, Work Material: SCM440, Overhang Amount: 235mm
Tool	: WEZR 17063RS5727Z04 (ø63, 4-tooth 4-stage)
Insert	: AOMT 170508PEER-G (ACU2500)
Cutting Conditions	: vc = 150m/min, fz = 0.15mm/t, ap = 50mm, Dry

■ Cutting Performance

● Optimised cutting edge shape and high-precision molding technology result in excellent wall accuracy

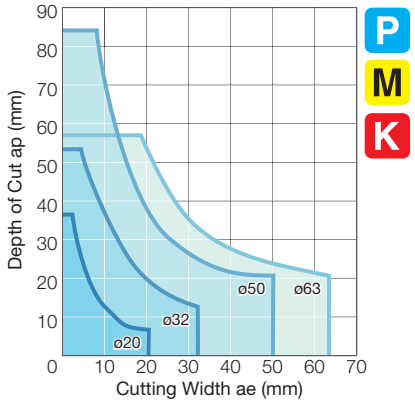




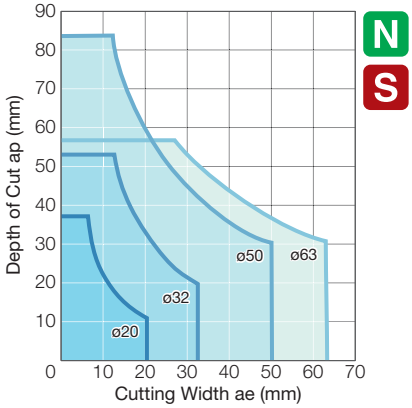
Machine	: Vertical Machining Centre BT50, Work Material: SCM435, Overhang Amount: 60mm
Tool	: WEZR 11032E3632Z02 (ø32, 2-tooth 4-stage)
Insert	: AOMT 11T308PEER-G (ACU2500)
Cutting Conditions	: vc = 160m/min, fz = 0.15mm/t, ap = 30mm, ae = 2mm, Dry

■ Application Range

● Steel, stainless steel, cast iron



● Aluminum alloys, titanium alloys



Note
· The depth of cut figures above are guidelines for use with BT50 machine tools. Use a depth of cut of approximately 50% if using BT40.
· For a tool overhang of L/D = 3 or L/D = 4, use a depth of cut of approximately 50% or 25%, respectively.
· There may be cases where machining cannot be performed at the depth of cut figures above, depending on the machine rigidity and work rigidity.
· Refer to H58 for the cutting speed and feed rate.

WEZR 11000RS type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

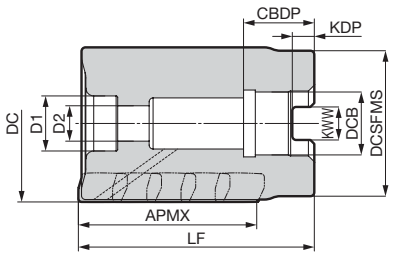
New

Rake Angle	Radial	-11° to -9°
	Axial	14° to 15°

44 to 53 mm | 90°

Shoulder Milling | Groove Milling | Side Milling

Fig 1



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
Metric	**WEZR 11040RS4416Z04**	●	**40**	44(43)	37	60(59.7)	16	8.4	5.6	18	14	9	20	5	4	0.27	1
	11050RS5322Z04	●	**50**	53(52)	47	70(69.7)	22	10.4	6.3	20	18	11	24	6	4	0.57	1

The APMX and LF dimensions in parentheses are dimensions using RE = 3.0/3.2 insert.
Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Bolt	Anti-seizure Cream
WEZR 11040RS4416Z04 WEZR 11050RS5322Z04	BFTX0306IP	1.5	TRDR08IP	BX0850 BX1060	SUMI-P

Identification Code

WEZR Series Code | **11** Insert Size | **040** Dia. | **R** Feed Direction | **S** Metric Bore | **44** Max. Depth of Cut | **16** Mounting Hole Diameter | **Z04** Effective No. of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	≤ 280HB	G	80 - **150** - 200	0.08 - **0.12** - 0.20	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80 - **100** - 120	0.08 - **0.12** - 0.20	
	Alloy Steel	≤ 280HB	G	80 - **150** - 180	0.08 - **0.12** - 0.20	
M	Stainless Steel	≤ 280HB	G	80 - **120** - 160	0.08 - **0.12** - 0.20	ACU2500 ACM200 ACM300
K	Cast Iron/ Ductile Cast Iron	—	G	80 - **150** - 200	0.08 - **0.12** - 0.20	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	—	G	40 - **50** - 60	0.08 - **0.12** - 0.20	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12.6%	S	300 - **500** - 800	0.05 - **0.10** - 0.15	DL2000 H20
		Si >12.6%	S	100 - **200** - 250	0.05 - **0.10** - 0.15	

Note
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ11 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT11T324PEER)
Corner radius = 3.0: C2.5
(AOMT11T330PEER)
Corner radius = 3.2: C2.5
(AOMT11T332PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide									Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		P K M	P		K	K		M S			N	P		
	General-purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
	Roughing	P K M S			P			K		M S					
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT	**11T302PEER-G**	●	●		●	●		●	●	●	—	—	●	0.2	1
	11T304PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
	11T305PEER-G	●							●	●	—	—		0.5	1
	11T308PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
	11T310PEER-G	●							●	●	—	—		1.0	1
	11T312PEER-G	●	●		●	●		●	●	●	—	—		1.2	1
	11T316PEER-G	●	●		●	●		●	●	●	—	—		1.6	1
	11T320PEER-G	●	●		●	●		●	●	●	—	—		2.0	1
	11T324PEER-G	●							●	●	—	—		2.4	1
	11T330PEER-G	●	●		●	●		●	●	●	—	—		3.0	2
	11T332PEER-G	●							●	●	—	—		3.2	2
AOMT	**11T304PEER-H**	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
	11T308PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
	11T312PEER-H	●							●	●	—	—	—	1.2	1
	11T316PEER-H	●							●	●	—	—	—	1.6	1
AOET	**11T302PEER-F**	●		—			—		—		—	—	—	0.2	1
	11T304PEER-F	●		—			—		—		—	—	—	0.4	1
	11T305PEER-F	●		—			—		—		—	—	—	0.5	1
	11T308PEER-F	●		—			—		—		—	—	—	0.8	1
	11T310PEER-F	●		—			—		—		—	—	—	1.0	1
	11T312PEER-F	●		—			—		—		—	—	—	1.2	1
	11T316PEER-F	●		—			—		—		—	—	—	1.6	1
	11T320PEER-F	●		—			—		—		—	—	—	2.0	1
	11T324PEER-F	●		—			—		—		—	—	—	2.4	1
	11T330PEER-F	●		—			—		—		—	—	—	3.0	2
	11T332PEER-F	●		—			—		—		—	—	—	3.2	2
AOET	**11T302PEFR-S**	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
	11T304PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
	11T305PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
	11T308PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
	11T310PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
	11T312PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
	11T316PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
	11T320PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
	11T324PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
	11T330PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.0	2
	11T332PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.2	2

Fig 1

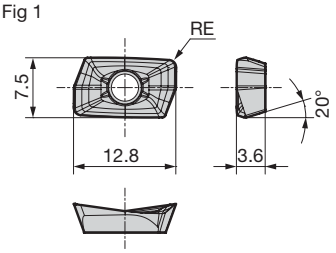
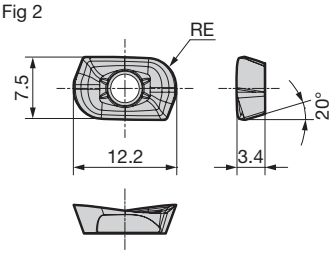


Fig 2



-G: General-purpose, -H: Strong Edge, -F: Medium Finishing, -S: Non-Ferrous Metals.
Use peripheral inserts with RE of 0.8mm or less from the second stage and above.

Recommended Cutting Conditions H78
Precautions for Mounting Inserts H55

WEZR 17000RS type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

New | Rake Angle: Radial -8° to -6°, Axial 7° to 15° | 29 to 57 mm | 90° | Shoulder Milling | Groove Milling | Side Milling

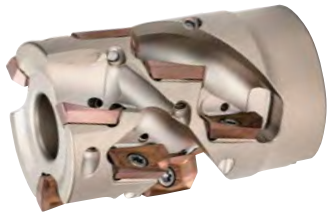
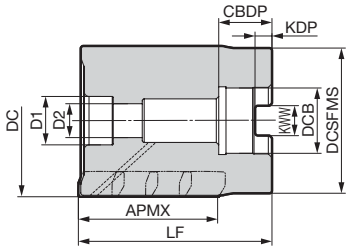


Fig 1



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
Metric	**WEZR 17050RS2922Z04**	●	**50**	29(28)	47	50(49.3)	22	10.4	6.3	20	18	11	8	2	4	0.35	1
	17050RS5722Z02	●	**50**	57(56)	47	80(79.3)	22	10.4	6.3	20	18	11	8	4	2	0.70	1
	17050RS5722Z03	●	**50**	57(56)	47	80(79.3)	22	10.4	6.3	20	18	11	12	4	3	0.59	1
	17063RS2927Z05	●	**63**	29(28)	60	55(54.3)	27	12.4	7	22	20	14	10	2	5	0.74	1
	17063RS5727Z03	●	**63**	57(56)	60	80(79.3)	27	12.4	7	22	20	14	12	4	3	1.11	1
	17063RS5727Z04	●	**63**	57(56)	60	80(79.3)	27	12.4	7	22	20	14	16	4	4	1.05	1
	17080RS5627Z05	●	**80**	56(55)	70	80(79.3)	27	12.4	7	22	20	14	20	4	5	1.85	1
	17080RS5632Z05	●	**80**	56(55)	70	80(79.3)	32	14.4	8	26	25	18	20	4	5	1.76	1

The APMX and LF dimensions in parentheses are dimensions using RE = 5.0/6.4 insert.
Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw		Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Bolt	Anti-seizure Cream
WEZR 17050RS2922Z04	BFTX0409IP	3.0	—	HPS1015	TRB15IP	BX1045	SUMI-P
WEZR 17050RS5722Z02						BX1070	
WEZR 17050RS5722Z03							
WEZR 17063RS2927Z05						BX1240	
WEZR 17063RS5727Z03							
WEZR 17063RS5727Z04						BX1265	
WEZR 17080RS5627Z05			TRDR15IP	—	—		
WEZR 17080RS5632Z05						BX1660	

Identification Code

WEZR Series Code | **17** Insert Size | **050** Dia. | **R** Feed Direction | **S** Metric Bore | **29** Max. Depth of Cut | **22** Mounting Hole Diameter | **Z04** Effective No. of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	≤ 280HB	G	80 - **150** - 200	0.10 - **0.20** - 0.30	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80 - **100** - 120	0.10 - **0.20** - 0.30	
	Alloy Steel	≤ 280HB	G	80 - **150** - 180	0.10 - **0.20** - 0.30	
M	Stainless Steel	≤ 280HB	G	80 - **120** - 160	0.10 - **0.20** - 0.30	ACU2500 ACM200 ACM300
K	Cast Iron/ Ductile Cast Iron	—	G	80 - **150** - 200	0.10 - **0.20** - 0.30	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	—	G	40 - **50** - 60	0.10 - **0.20** - 0.30	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12.6%	S	300 - **500** - 800	0.05 - **0.10** - 0.15	DL2000 H20
		Si >12.6%	S	100 - **200** - 250	0.05 - **0.10** - 0.15	

Note
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ17 type

Reworking guidelines
Corner radius = 2.4: C1 (AOMT170524PEER)
Corner radius = 3.0: C1.5 (AOMT170530PEER)
Corner radius = 3.2: C1.5 (AOMT170532PEER)
Corner radius = 4.0: C2 (AOMT170540PEER)
Corner radius = 5.0: C5 (AOMT170550PEER)
Corner radius = 6.4: C5 (AOMT170564PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

WEZR 17000RS type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		PKM	P		K	K		MS		N	P		
	General-purpose	PKMS	PKM		P	K		K	MS	MS	N	N		
	Roughing	PKMS			P			K		MS				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT	170502PEER-L	●		—			—		●	●	—	—		0.2	1
	170504PEER-L	●	●	—	●	●	—	●	●	●	—	—	●	0.4	1
	170508PEER-L	●	●	—	●	●	—	●	●	●	—	—	●	0.8	1
	170512PEER-L	●		—			—		●	●	—	—		1.2	1
	170516PEER-L	●		—			—		●	●	—	—		1.6	1
AOMT	170502PEER-G	●	●		●	●		●	●	●	—	—		0.2	1
	170504PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
	170505PEER-G	●							●	●	—	—		0.5	1
	170508PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
	170510PEER-G	●							●	●	—	—		1.0	1
	170512PEER-G	●	●		●	●		●	●	●	—	—		1.2	1
	170516PEER-G	●	●		●	●		●	●	●	—	—		1.6	1
	170520PEER-G	●	●		●	●		●	●	●	—	—		2.0	1
	170524PEER-G	●							●	●	—	—		2.4	1
	170530PEER-G	●	●		●	●		●	●	●	—	—		3.0	1
	170532PEER-G	●	●		●	●		●	●	●	—	—		3.2	1
	170540PEER-G	●	●		●	●		●	●	●	—	—		4.0	1
	170550PEER-G	●	●		●	●		●	●	●	—	—		5.0	2
	170564PEER-G	●							●	●	—	—		6.4	2
AOMT	170504PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
	170508PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
	170512PEER-H	●							●	●	—	—	—	1.2	1
	170516PEER-H	●							●	●	—	—	—	1.6	1
AOET	170502PEER-F	●		—			—		—		—	—	—	0.2	1
	170504PEER-F	●		—			—		—		—	—	—	0.4	1
	170505PEER-F	●		—			—		—		—	—	—	0.5	1
	170508PEER-F	●		—			—		—		—	—	—	0.8	1
	170510PEER-F	●		—			—		—		—	—	—	1.0	1
	170512PEER-F	●		—			—		—		—	—	—	1.2	1
	170516PEER-F	●		—			—		—		—	—	—	1.6	1
	170520PEER-F	●		—			—		—		—	—	—	2.0	1
	170524PEER-F	●		—			—		—		—	—	—	2.4	1
	170530PEER-F	●		—			—		—		—	—	—	3.0	1
	170532PEER-F	●		—			—		—		—	—	—	3.2	1
	170540PEER-F	●		—			—		—		—	—	—	4.0	1
	170550PEER-F	●		—			—		—		—	—	—	5.0	2
	170564PEER-F	●		—			—		—		—	—	—	6.4	2
AOET	170502PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
	170504PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
	170505PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
	170508PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
	170510PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
	170512PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
	170516PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
	170520PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
	170524PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
	170530PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.0	1
	170532PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.2	1
	170540PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	4.0	1
	170550PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	5.0	2
	170564PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	6.4	2

-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge, -F: Medium Finishing, -S: Non-Ferrous Metals.
Use peripheral inserts with RE of 0.8mm or less from the second stage and above.

Fig 1

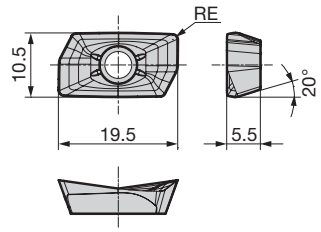
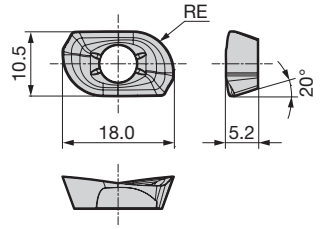


Fig 2



Recommended Cutting Conditions H80
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZR 11000E type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

New

Rake Angle	Radial	-15° to -11°
	Axial	8° to 14°

19 to 61 mm | 90°

Shoulder Milling | Groove Milling | Side Milling

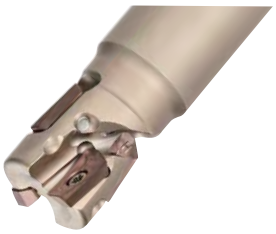


Fig 1

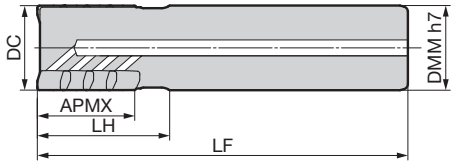
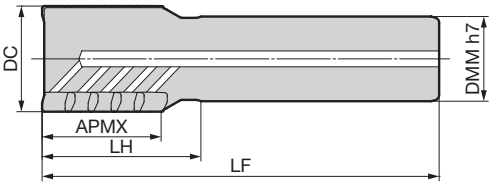


Fig 2



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
WEZR 11020E1920Z02	●	**20**	19(18)	20	30(29.7)	110(109.7)	4	2	2	0.22	1
11020E3620Z01	●	**20**	36(35)	20	45(44.7)	125(124.7)	4	4	1	0.24	1
11025E2725Z02	●	**25**	27(26)	25	40(39.7)	130(129.7)	6	3	2	0.41	1
11025E3625Z02	●	**25**	36(35)	25	50(49.7)	140(139.7)	8	4	2	0.42	1
11030E5325Z02	●	**30**	53(52)	25	65(64.7)	155(154.7)	12	6	2	0.52	2
11032E3632Z02	●	**32**	36(35)	32	50(49.7)	140(139.7)	8	4	2	0.74	1
11032E3632Z03	●	**32**	36(35)	32	50(49.7)	140(139.7)	12	4	3	0.71	1
11032E5332Z02	●	**32**	53(52)	32	70(69.7)	160(159.7)	12	6	2	0.90	1
11035E5332Z03	●	**35**	53(52)	32	65(64.7)	155(154.7)	18	6	3	0.88	2
11040E4432Z03	●	**40**	44(43)	32	60(59.7)	150(149.7)	15	5	3	0.87	2
11040E4432Z04	●	**40**	44(43)	32	60(59.7)	150(149.7)	20	5	4	0.85	2
11040E6132Z03	●	**40**	61(60)	32	75(74.7)	165(164.7)	21	7	3	0.95	2

The APMX, LH and LF dimensions in parentheses are dimensions using RE = 3.0/3.2 insert. Inserts are sold separately.

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
	N·m		
BFTX0306IP	1.5	TRDR08IP	SUMI-P

Identification Code

WEZR	11	032	E	36	32	Z02
Series Code	Insert Size	Dia.	Shank type	Max. Depth of Cut	Shank Dia.	Effective No. of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	≤ 280HB	G	80 - **150** - 200	0.08 - **0.12** - 0.20	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80 - **100** - 120	0.08 - **0.12** - 0.20	
	Alloy Steel	≤ 280HB	G	80 - **150** - 180	0.08 - **0.12** - 0.20	
M	Stainless Steel	≤ 280HB	G	80 - **120** - 160	0.08 - **0.12** - 0.20	ACU2500 ACM200 ACM300
K	Cast Iron/ Ductile Cast Iron	—	G	80 - **150** - 200	0.08 - **0.12** - 0.20	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	—	G	40 - **50** - 60	0.08 - **0.12** - 0.20	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12.6%	S	300 - **500** - 800	0.05 - **0.10** - 0.15	DL2000 H20
		Si >12.6%	S	100 - **200** - 250	0.05 - **0.10** - 0.15	

Note
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ11 type

Reworking guidelines
Corner radius = 2.4: C1 (AOMT11T324PEER)
Corner radius = 3.0: C2.5 (AOMT11T330PEER)
Corner radius = 3.2: C2.5 (AOMT11T332PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

WEZR 11000E type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification	Coated Carbide									Cemented Carbide	DLC	Cermet		
Process: High-speed/Light Cutting		P K M	P		K	K		M S			N	P		
Process: General-purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Process: Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 11T302PEER-G	●	●		●	●		●	●	●	—	—	●	0.2	1
11T304PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
11T305PEER-G	●							●	●	—	—		0.5	1
11T308PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
11T310PEER-G	●							●	●	—	—		1.0	1
11T312PEER-G	●	●		●	●		●	●	●	—	—		1.2	1
11T316PEER-G	●	●		●	●		●	●	●	—	—		1.6	1
11T320PEER-G	●	●		●	●		●	●	●	—	—		2.0	1
11T324PEER-G	●							●	●	—	—		2.4	1
11T330PEER-G	●	●		●	●		●	●	●	—	—		3.0	2
11T332PEER-G	●							●	●	—	—		3.2	2
AOMT 11T304PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
11T308PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
11T312PEER-H	●							●	●	—	—	—	1.2	1
11T316PEER-H	●							●	●	—	—	—	1.6	1
AOET 11T302PEER-F	●		—			—		—		—	—	—	0.2	1
11T304PEER-F	●		—			—		—		—	—	—	0.4	1
11T305PEER-F	●		—			—		—		—	—	—	0.5	1
11T308PEER-F	●		—			—		—		—	—	—	0.8	1
11T310PEER-F	●		—			—		—		—	—	—	1.0	1
11T312PEER-F	●		—			—		—		—	—	—	1.2	1
11T316PEER-F	●		—			—		—		—	—	—	1.6	1
11T320PEER-F	●		—			—		—		—	—	—	2.0	1
11T324PEER-F	●		—			—		—		—	—	—	2.4	1
11T330PEER-F	●		—			—		—		—	—	—	3.0	2
11T332PEER-F	●		—			—		—		—	—	—	3.2	2
AOET 11T302PEER-P20	●		—			—		—		—	—	—	0.2	1
11T304PEER-P20	●		—			—		—		—	—	—	0.4	1
11T305PEER-P20	●		—			—		—		—	—	—	0.5	1
11T308PEER-P20	●		—			—		—		—	—	—	0.8	1
11T310PEER-P20	●		—			—		—		—	—	—	1.0	1
11T312PEER-P20	●		—			—		—		—	—	—	1.2	1
AOET 11T302PEER-P25	●		—			—		—		—	—	—	0.2	1
11T304PEER-P25	●		—			—		—		—	—	—	0.4	1
11T305PEER-P25	●		—			—		—		—	—	—	0.5	1
11T308PEER-P25	●		—			—		—		—	—	—	0.8	1
11T310PEER-P25	●		—			—		—		—	—	—	1.0	1
11T312PEER-P25	●		—			—		—		—	—	—	1.2	1
AOET 11T302PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
11T304PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
11T305PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
11T308PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
11T310PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
11T312PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
11T316PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
11T320PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
11T324PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
11T330PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.0	2
11T332PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.2	2

Fig 1

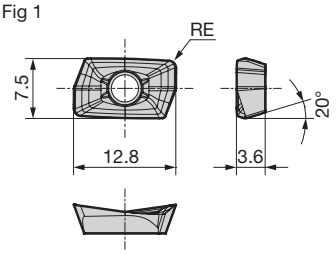
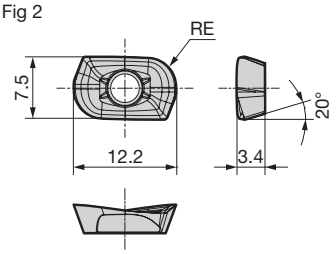


Fig 2



-G: General-purpose, -H: Strong Edge, -F: Medium Finishing, -P20/-P25: High-precision Machining, -S: Non-Ferrous Metals.
*-P20 is applicable to cutter diameter ø20. -P25 is applicable to cutter diameter ø25.
Use peripheral inserts with RE of 0.8mm or less from the second stage and above.

Recommended Cutting Conditions H82
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZR 17000E type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

New

Rake Angle	Radial	-9° to -8°
	Axial	10° to 12°

29 to 84 mm | 90°

Shoulder Milling | Groove Milling | Side Milling

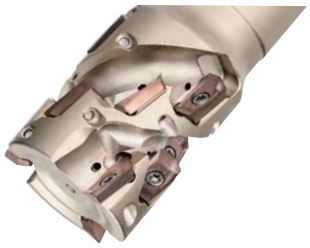
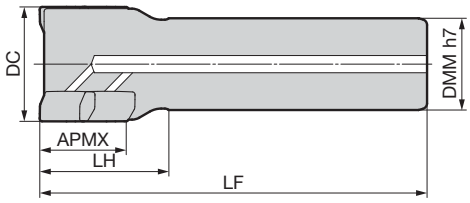


Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
WEZR 17040E2932Z03	●	**40**	29(28)	32	45(44.3)	135(134.3)	6	2	3	0.75	1
17040E4332Z02	●	**40**	43(42)	32	60(59.3)	150(149.3)	6	3	2	0.86	1
17050E5742Z03	●	**50**	57(56)	42	75(74.3)	165(164.3)	12	4	3	1.58	1
17050E8442Z02	●	**50**	84(83)	42	105(104.3)	195(194.3)	12	6	2	1.94	1

The APMX, LH and LF dimensions in parentheses are dimensions using RE = 5.0/6.4 insert. Inserts are sold separately.

Parts

Flat Insert Screw		Integrated Wrench	Anti-seizure Cream
BFTX0409IP	3.0	TRDR15IP	SUMI-P

Identification Code

WEZR **17** **040** **E** **29** **32** **Z03**

Series Code	Insert Size	Dia.	Shank type	Max. Depth of Cut	Shank Dia.	Effective No. of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	≤ 280HB	G	80 - **150** - 200	0.10 - **0.20** - 0.30	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80 - **100** - 120	0.10 - **0.20** - 0.30	
	Alloy Steel	≤ 280HB	G	80 - **150** - 180	0.10 - **0.20** - 0.30	
M	Stainless Steel	≤ 280HB	G	80 - **120** - 160	0.10 - **0.20** - 0.30	ACU2500 ACM200 ACM300
K	Cast Iron/ Ductile Cast Iron	—	G	80 - **150** - 200	0.10 - **0.20** - 0.30	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	—	G	40 - **50** - 60	0.10 - **0.20** - 0.30	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12.6%	S	300 - **500** - 800	0.05 - **0.10** - 0.15	DL2000 H20
		Si >12.6%	S	100 - **200** - 250	0.05 - **0.10** - 0.15	

Note
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ17 type

Reworking guidelines
Corner radius = 2.4: C1 (AOMT170524PEER)
Corner radius = 3.0: C1.5 (AOMT170530PEER)
Corner radius = 3.2: C1.5 (AOMT170532PEER)
Corner radius = 4.0: C2 (AOMT170540PEER)
Corner radius = 5.0: C5 (AOMT170550PEER)
Corner radius = 6.4: C5 (AOMT170564PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

WEZR 17000E type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		PKM	P		K	K		MS		N	P		
	General-purpose	PMS	PKM		P	K		K	MS	MS	N	N		
	Roughing	PMS			P			K		MS				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 170502PEER-L		●		—			—		●	●	—	—		0.2	1
170504PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.4	1
170508PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.8	1
170512PEER-L		●		—			—		●	●	—	—		1.2	1
170516PEER-L		●		—			—		●	●	—	—		1.6	1
AOMT 170502PEER-G		●	●		●	●		●	●	●	—	—		0.2	1
170504PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
170505PEER-G		●							●	●	—	—		0.5	1
170508PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
170510PEER-G		●							●	●	—	—		1.0	1
170512PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
170516PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
170520PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
170524PEER-G		●							●	●	—	—		2.4	1
170530PEER-G		●	●		●	●		●	●	●	—	—		3.0	1
170532PEER-G		●	●		●	●		●	●	●	—	—		3.2	1
170540PEER-G		●	●		●	●		●	●	●	—	—		4.0	1
170550PEER-G		●	●		●	●		●	●	●	—	—		5.0	2
170564PEER-G		●							●	●	—	—		6.4	2
AOMT 170504PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
170508PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
170512PEER-H		●							●	●	—	—	—	1.2	1
170516PEER-H		●							●	●	—	—	—	1.6	1
AOET 170502PEER-F		●		—			—		—		—	—	—	0.2	1
170504PEER-F		●		—			—		—		—	—	—	0.4	1
170505PEER-F		●		—			—		—		—	—	—	0.5	1
170508PEER-F		●		—			—		—		—	—	—	0.8	1
170510PEER-F		●		—			—		—		—	—	—	1.0	1
170512PEER-F		●		—			—		—		—	—	—	1.2	1
170516PEER-F		●		—			—		—		—	—	—	1.6	1
170520PEER-F		●		—			—		—		—	—	—	2.0	1
170524PEER-F		●		—			—		—		—	—	—	2.4	1
170530PEER-F		●		—			—		—		—	—	—	3.0	1
170532PEER-F		●		—			—		—		—	—	—	3.2	1
170540PEER-F		●		—			—		—		—	—	—	4.0	1
170550PEER-F		●		—			—		—		—	—	—	5.0	2
170564PEER-F		●		—			—		—		—	—	—	6.4	2
AOET 170502PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
170505PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
170508PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
170510PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
170512PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
170516PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
170520PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
170524PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
170530PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	1
170532PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	1
170540PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	4.0	1
170550PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	5.0	2
170564PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	6.4	2

Fig 1

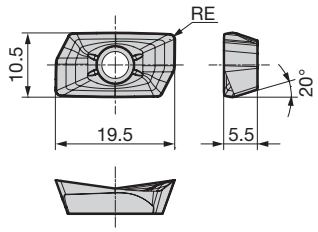
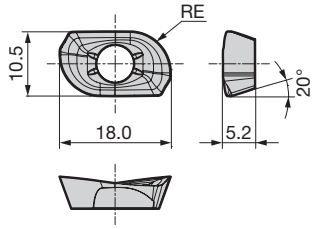


Fig 2



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge, -F: Medium Finishing, -S: Non-Ferrous Metals.
Use peripheral inserts with RE of 0.8mm or less from the second stage and above.

Recommended Cutting Conditions H84
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

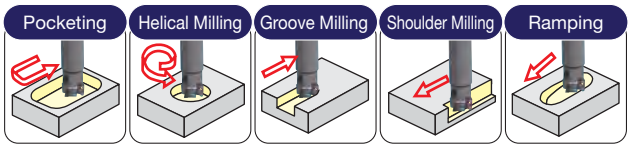
WEX series

VIDEO OF CUTTING

■ Features

Utilising an insert with a strong cutting edge design coupled with a high rigidity body, for stable and high-efficiency milling with low cutting force.
The improved body and insert accuracy realise high accuracy and smooth surface finish, supporting various machining with a selection of 6 types of chipbreakers and 9 milling grades.

Compatible with Wide Range of Milling

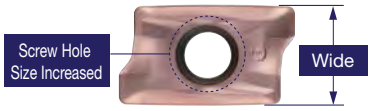


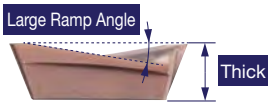
Higher Accuracy Cutting Edge with Both Sharpness and Cutting Edge Strength

Unique curved cutting edge design lowers cutting force yet improves cutting edge strength.
Achieves high quality machined surface with high precision cutting edge.
Smooth deep groove milling even with low-rigidity machines

High-precision Curved Cutting Edge

High Rake Wave Cutting Edge





Coolant Holes are a Standard Feature for the Whole Series

Improved chip evacuation with air or coolant supply

Highly Durable Body

Special surface treatment improves corrosion resistance and scratch resistance
Increased screw size improves clamping force and durability

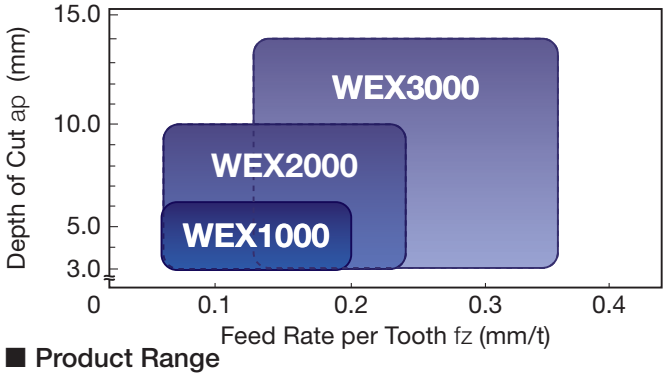
WEX1000 Series

Enables multiple teeth high-efficiency milling for small stock removal amounts

Wide Variety of Inserts

6 types of chipbreaker and 9 milling grades available for a wide range of applications and work materials

■ WEX Series Application Range (Shoulder Milling)

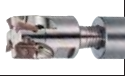


■ WEX1000 Number of Teeth

Dia.	Number of Teeth		
	WEX1000E Standard type Max. Depth of Cut: 6.0mm	**WEX1000EL** Long type Max. Depth of Cut: 6.0mm	WEX2000E Standard type Max. Depth of Cut: 10.0mm
ø10mm	2	2	—
ø12mm	3	2	—
ø14mm	3	3	1
ø16mm	4	3	2

■ Product Range

Type	Cat. No.	Description	Dia. (mm) ø10	ø12	ø14	ø16	ø18	ø20	ø22	ø25	ø28	ø30	ø32	ø35	ø40	ø50	ø63	ø80	ø100	ø125	Shape
Shell	**WEX 1000F**	Standard type											8		10	12	14				
Shell	**WEX 2000F**	Standard type													6	7	8				
Shell	**WEX 3000F**	Standard type													4	5	6				
Shell	**WEX 3000R** Inch	Standard type																4	5	6	
Shell	**WEXF 3000R** Inch	Fine Pitch																7	8	9	
Shank	**WEX 1000E**	Standard type	2	3	3	4	4	5		7											
Shank	**WEX 1000EL**	Long type	2	2	3	3	3	4													
Shank	**WEX 2000E**	Standard type			1	2	2	3	3	4	4	4	5		6	7	8				
Shank	**WEX 2000EL**	Long type			1	2	2	2	2	2	2	2	2		2						
Shank	**WEX 3000E**	Standard type								2*	2	3	3*	3	4	5	6				
Shank	**WEX 3000ES**	Short type														5*	6*				
Shank	**WEX 3000EL**	Long type								2	2	2	2	2	2						
Shank	**WEX 3000E-C**	Coarse Pitch type													3	3	4				
Shank	**WEX 3000ES-C**	Short & Coarse Pitch type														3*	4*				
Modular	**WEX 2000M**	Modular type				2	2	3	3	4	4	4	5		6						
Modular	**WEX 3000M**	Modular type								2	2	3	3	3	4						



Number in ●●● shows the number of teeth Inch Inch Bore *mark: Different diameter shanks in stock

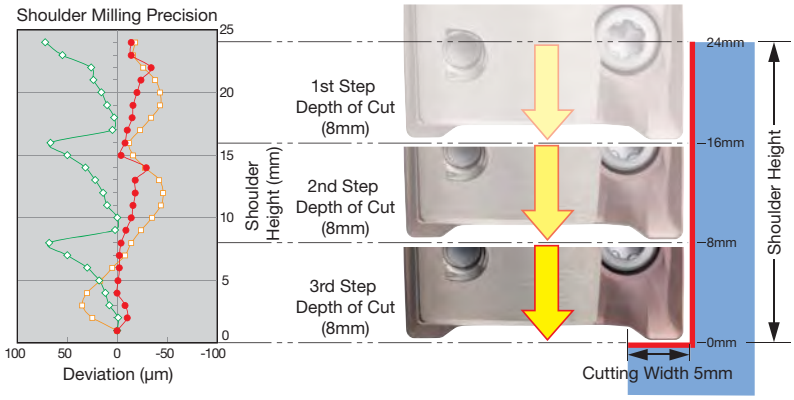
Modular type ☞ H264

■ Cutting Performance

(1) Shoulder milling precision

High-precision cutting edges provide very small step marks
(less than half that of competitors' products)

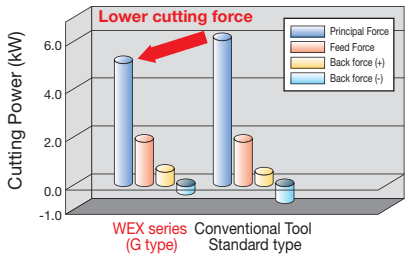
WEX3032E
Competitor's Product
Conventional Tool



Cutting Conditions
Work Material: SS400
Tool: WEX3032E (ø32)
Insert: AXMT170508PEER-G
Grade: ACP200
Cutting Speed: vc = 150m/min
Feed Rate: fz = 0.15mm/t (vf = 675mm/min)
Cutting Width: ae = 5mm
Depth of Cut: ap = 8mm×3 times Dry

(2) Cutting force

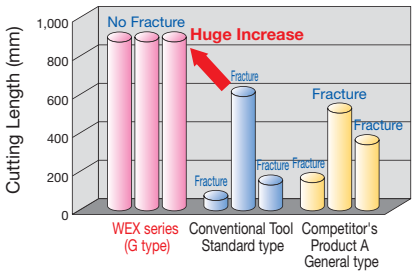
Cutting force (principal force) is approximately 15% lower than conventional tools



Cutting Conditions
Work Material: S50C
Tool: WEX3032E (ø32)
Insert: AXMT170508PEER-G
Grade: ACP200
Cutting Speed: vc = 200m/min
Feed Rate: fz = 0.2mm/t (vf = 1,200mm/min)
Cutting Width: ae = 8mm
Depth of Cut: ap = 10mm, Dry

(3) Fracture resistance

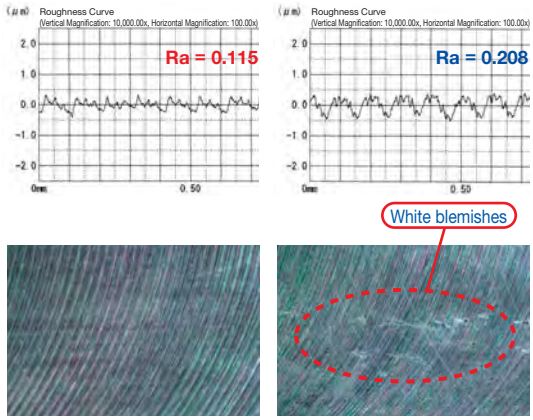
Huge increase in fracture resistance with improved cutting edge strength



Cutting Conditions
Work Material: SCM440
Tool: WEX3032E (ø32)
Insert: AXMT170508PEER-G
Grade: ACP200
Cutting Speed: vc = 100m/min
Feed Rate: fz = 0.4mm/t (vf = 1,260mm/min)
Cutting Width: ae = 25mm
Depth of Cut: ap = 3mm, Dry

(4) Surface finish (aluminum alloy milling)

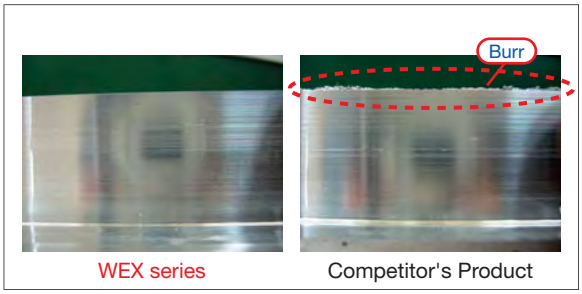
Smooth surface finish free of white blemishes



Cutting Conditions
Work Material: A5052
Tool: WEX3032E (ø32)
Insert: AXET170504PEFR-S (H1)
Cutting Speed: vc = 800m/min
Feed Rate: fz = 0.1mm/t (vf = 2,400mm/min)
Cutting Width: ae = 16mm
Depth of Cut: ap = 10mm, Dry

(5) Wall surface burrs (aluminum alloy milling)

High rake edge significantly reduces burrs

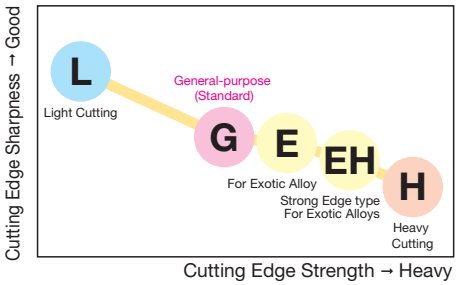


Cutting Conditions
Work Material: A5052
Tool: WEX3032E (ø32)
Insert: AXET170504PEFR-S (H1)
Cutting Speed: vc = 800m/min
Feed Rate: fz = 0.1mm/t (vf = 2,400mm/min)
Cutting Width: ae = 5mm
Depth of Cut: ap = 12mm, Dry

■ Chipbreaker Selection

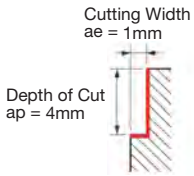
Work Material	P K			M S		N
Applications	Light Cutting, Low Rigidity Milling and Reduction of Burrs	Main Chipbreaker General-purpose to Interrupted Milling	Roughing, Heavy Interrupted Cutting and Hardened Steel Milling	Light Cutting to General-purpose	Heavy Interrupted Machining	Aluminum Alloy and Non-Ferrous Metal
Features	Low Cutting Force	General-purpose type	High Strength type	General-purpose type For Exotic Alloys	Strong Edge type For Exotic Alloys	High Rake type
Chipbreaker	L type	G type	H type	E type	EH type	S type
1000 Series Cross Section	25°	0.05mm 25°	0.05mm 15°	-	-	25°
2000 Series Cross Section	-	0.05mm 28°	0.2mm 20°	0.05mm 17°	0.1mm 17°	27°
3000 Series Cross Section	0.05mm 25°	0.15mm 20°	0.24mm 5°	0.2mm 14°	0.2mm 8°	30°

■ Chipbreaker Selection Guide



■ Recommended Cutting Conditions

WEX1000



Tool: WEX1012E, Insert: AX□T0602

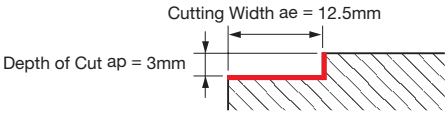
Cutting Conditions: Depth of Cut ap = 4mm, Width of Cut ae = 1mm, Dry

ISO Classification	Work Material		Workpiece Hardness (HB)	Chipbreaker	Grade																					
					ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
					Feed Rate per Tooth fz (mm/t)																						
					0.08	0.12	0.16	0.08	0.12	0.16	0.08	0.12	0.16	0.10	0.15	0.20	0.10	0.15	0.20	0.08	0.10	0.12	0.08	0.10	0.12	0.05	0.10	0.15
					Cutting Speed vc (m/min)																							
P	Steel, Carbon Steel	S15C	125	G	260	240	220	240	220	200	220	200	180															
		S45C	190	G	200	180	160	180	160	140	180	160	140															
		S45C Hardened	250	G	180	120	140	160	140	120	150	130	110															
		S75C	270	G	160	140	120	150	130	110	130	110	110															
		S75C Hardened	300	G	100	80	70	90	70	60	70	60	50															
	Low Alloy Steel	(SCM, SNCM)	180	G	200	180	160	180	160	150	160	150	130															
		SCM, SNCM Hardened	275	G	130	110	90	120	100	90	100	90	80															
		SCM, SNCM Hardened	300	G	120	100	80	100	90	80	90	80	60															
		SCM, SNCM Hardened	350	G	90	80	60	80	70	60	70	60	40															
	High Alloy Steel	(SKD, SKT, SKH)	200	G	180	170	160	170	160	130	150	140	120															
		SKD, SKT, SKH Hardened	325	G	100	80	60	80	60	50	60	50	30															
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200	E																170	150	120	140	130	110			
		SUS403 and Others (Martensitic/Hardened)	240	E																140	120	100	120	100	90			
		SUS304, SUS316 (Austenitic)	180	E																180	160	140	160	140	130			
K	Cast Iron			G										240	220	200	220	200	180									
	Ductile Cast Iron			G										160	140	120	140	120	100									
S	Exotic Alloy			E																50	35		45	25				
N	Aluminum Alloy	Si Content of 12.6% or less		S																						800	600	400
		Si Content of over 12.6%		S																						240	200	160
	Copper Alloy			S																						330	300	270

● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, workpiece shape, clamping system).
● For groove milling, adjust the feed rate to around 70% of the above values.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WEX2000



Tool: WEX2025E, Insert: AX□T1235

Cutting Conditions: Depth of Cut ap = 3mm, Width of Cut ae = 12.5mm, Dry

ISO Classification	Work Material		Workpiece Hardness (HB)	Chipbreaker	Grade																					
					ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
					Feed Rate per Tooth fz (mm/t)																						
					0.08	0.15	0.20	0.08	0.15	0.20	0.08	0.15	0.20	0.08	0.15	0.20	0.08	0.15	0.20	0.08	0.15	0.20	0.08	0.15	0.20	0.05	0.15	0.22
					Cutting Speed vc (m/min)																							
P	Steel, Carbon Steel	S15C	125	G	380	350	330	350	330	315	330	315	295															
		S45C	190	G	285	255	235	255	235	220	235	220	200															
		S45C Hardened	250	G	235	210	190	210	190	170	190	170	150															
		S75C	270	G	190	162	143	171	152	133	152	133	115															
		S75C Hardened	300	G	145	115	95	115	95	75	95	75	55															
	Low Alloy Steel	(SCM, SNCM)	180	G	265	235	220	235	220	200	220	200	180															
		SCM, SNCM Hardened	275	G	170	145	125	150	130	115	130	115	95															
		SCM, SNCM Hardened	300	G	150	125	105	135	115	95	115	95	75															
		SCM, SNCM Hardened	350	G	125	95	75	105	85	65	85	65	45															
	High Alloy Steel	(SKD, SKT, SKH)	200	G	235	210	190	210	190	170	190	170	150															
		SKD, SKT, SKH Hardened	325	G	125	95	75	95	75	55	75	55	35															
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200	E																175	155	125	155	140	110			
		SUS403 and Others (Martensitic/Hardened)	240	EH																160	140	110	145	125	100			
		SUS304, SUS316 (Austenitic)	180	E																190	170	140	170	150	125			
K	Cast Iron			G										285	255	235	255	235	220									
	Ductile Cast Iron			G										190	160	140	160	140	125									
S	Exotic Alloy		300	E																50	40		45	35				
	(Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		330	E																35	25		30	20				
N	Aluminum Alloy	Si Content of 12.6% or less		S																						1000	750	500
		Si Content of over 12.6%		S																						250	200	170
	Copper Alloy			S																						350	330	300

● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, workpiece shape, clamping system).
● For groove milling, adjust the feed rate to around 70% of the above values.

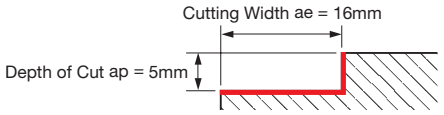
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

■ Recommended Cutting Conditions

WEX3000

Tool: WEX3032E, Insert: AX□T1705

Cutting Conditions: Depth of Cut ap = 5mm, Width of Cut ae = 16mm, Dry



ISO Classification	Work Material		Workpiece Hardness (HB)	Chipbreaker	Grade																										
					ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000						
					Feed Rate per Tooth fz (mm/t)																												
					0.12	0.25	0.35	0.12	0.25	0.35	0.12	0.25	0.35	0.12	0.25	0.35	0.12	0.25	0.35	0.12	0.25	0.35	0.12	0.25	0.35	0.05	0.15	0.25			
					Cutting Speed vc (m/min)																												
P	Steel, Carbon Steel	S15C	125	G	400	370	350	370	350	330	350	330	310																		
		S45C	190	G	300	270	250	270	250	230	250	230	210																		
		S45C Hardened	250	G	250	220	200	220	200	180	200	180	160																		
		S75C	270	G	200	170	150	180	160	140	160	140	120																		
		S75C Hardened	300	G	150	120	100	120	100	80	100	80	60																		
	Low Alloy Steel	(SCM, SNCM)	180	G	280	250	230	250	230	210	230	210	190																		
		SCM, SNCM Hardened	275	G	180	150	130	160	140	120	140	120	100																		
		SCM, SNCM Hardened	300	G	160	130	110	140	120	100	120	100	80																		
		SCM, SNCM Hardened	350	G	130	100	80	110	90	70	90	70	50																		
	High Alloy Steel	(SKD, SKT, SKH)	200	G	250	220	200	220	200	180	200	180	160																		
		SKD, SKT, SKH Hardened	325	G	130	100	80	100	80	60	80	60	40																		
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200	E							185	165	135							185	165	135	165	150	120						
		SUS403 and Others (Martensitic/Hardened)	240	EH							170	150	120							170	150	120	150	135	110						
		SUS304, SUS316 (Austenitic)	180	E							200	180	150							200	180	150	180	160	135						
K	Cast Iron			G										300	270	250	270	250	230												
	Ductile Cast Iron			G										200	170	150	170	150	130												
S	Exotic Alloy		300	E													50	30		50	30		45	25							
	(Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		330	E													50	30		50	30		45	25							
N	Aluminum Alloy	Si Content of 12.6% or less		S																						1000	750	500			
		Si Content of over 12.6%		S																						250	200	170			
	Copper Alloy			S																						350	330	300			

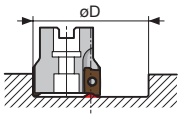
● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, workpiece shape, clamping system).
● For groove milling, adjust the feed rate to around 70% of the above values.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

■ Recommended Values for Helical Milling and Ramping

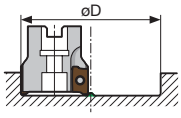
Precautions for Helical Milling

For Minimum Diameter and Below



Centre uncut portion cannot be removed by traverse cutting with the same cutter.

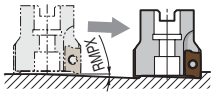
For Maximum Diameter and Above



Centre uncut portion can be removed by traverse cutting with the same cutter.

Precautions for Ramping

Use at the RMPX at right or lower.



Recommended Values for Helical Milling and Ramping

Dia. (mm) DC	WEX1000 (AX□T06···)			WEX2000 (AX□T12···)			WEX3000 (AX□T17···)		
	Helical Milling (mm)		Ramping	Helical Milling (mm)		Ramping	Helical Milling (mm)		Ramping
	Machining Dia. øD		Maximum Ramp Angle RMPX	Machining Dia. øD		Maximum Ramp Angle RMPX	Machining Dia. øD		Maximum Ramp Angle RMPX
	Min. Dia.	Max. Dia.		Min. Dia.	Max. Dia.		Min. Dia.	Max. Dia.	
10	16.0	18.0	2°30’						
12	20.0	22.0	1°45’						
14	24.0	26.0	1°25’	25.0	27.0	1°40’			
16	28.0	30.0	1°00’	29.0	31.0	1°20’			
18	32.0	34.0	0°45’	33.0	35.0	1°10’			
20	36.0	38.0	0°30’	37.0	39.0	1°00’			
22				41.0	43.0	0°50’			
25	46.0	48.0	0°30’	47.0	49.0	0°45’	44.5	48.0	1°30’
28				53.0	55.0	0°45’	50.5	54.0	1°10’
30				57.0	59.0	0°40’	54.5	58.0	1°10’
32	60.0	62.0	0°25’	61.0	63.0	0°35’	58.5	62.0	1°00’
35							64.5	68.0	0°50’
40	76.0	78.0	0°20’	77.0	79.0	0°25’	74.5	78.0	0°45’
50	96.0	98.0	0°15’	97.0	99.0	0°20’	94.5	98.0	0°30’
63	122.0	124.0	0°10’	123.0	125.0	0°15’	120.5	124.0	0°20’
80							154.5	158.0	0°15’
100							Unusable	Unusable	Unusable
125							Unusable	Unusable	Unusable

The table above shows recommended values with corner radius 0.8mm.

WEX 1000F type

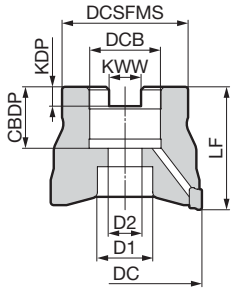
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	7° to 17°
	Axial	9° to 17°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	WEX 1032F	●	32	31	40	16	8.4	5.6	18	14	9	8	0.16	1
	1040F	●	40	32	40	16	8.4	5.6	18	14	9	10	0.21	1
	1050F	●	50	38	40	22	10.4	6.3	20	18	11	12	0.30	1
	1063F	●	63	48	40	22	10.4	6.3	20	18	11	14	0.52	1

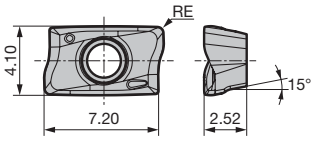
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light	P			K		MS		KN	N		
	General-purpose		PM	PM	K		MS	MS		N		
	Roughing		PM	PM		K		MS				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 060204PDER-L		●	●	●	●	●	●	●	—	—	0.4	1
060208PDER-L		●	●	●	●	●	●	●	—	—	0.8	1
060212PDER-L		●	●	●	●	●	●	●	—	—	1.2	1
060202PDER-G		●	●	●	●	●	●	●	—	—	0.2	1
060204PDER-G		●	●	●	●	●	●	●	—	—	0.4	1
060208PDER-G		●	●	●	●	●	●	●	—	—	0.8	1
060212PDER-G		●	●	●	●	●	●	●	—	—	1.2	1
060204PDER-H		●	●	●	●	●	●	●	—	—	0.4	1
060208PDER-H		●	●	●	●	●	●	●	—	—	0.8	1
060212PDER-H		●	●	●	●	●	●	●	—	—	1.2	1
060202PDFR-S		—	—	—	—	—	—	—	●	●	0.2	1

Fig 1



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge, -S: Aluminum Alloy.

Recommended Cutting Conditions H88

Parts

(Sold Separately)

Flat Insert Screw		Wrench	Anti-seizure Cream	Torque Wrench
				0.5N·m
BFTX01804IP	0.5	TRX06IP	SUMI-P	TRDR06IP05

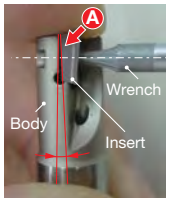
Identification Code

WEX 1 **032** **F**

Series Code | Insert Size | Dia. | Metric Bore

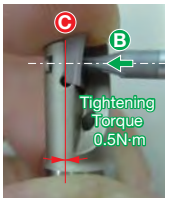
Precautions when Mounting WEX1000 Inserts

1



Press the top of the insert in the direction of A.

2



Hold down as shown in C so that there is no gap between the insert bottom and the base of insert pocket, and tighten with wrench B (tightening torque 0.5N·m)

A dedicated torque wrench is optionally available (sold separately).

N·m Recommended Tightening Torque (N·m)

SEC-WaveMill

WEX 2000F type

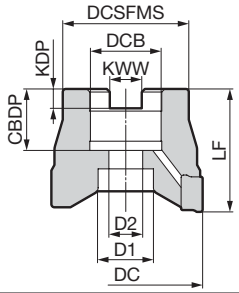
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	16° to 18°
	Axial	23° to 25°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WEX 2040F**	●	**40**	32	40	**16**	8.4	5.6	18	14	9	6	0.19	1
	2050F	●	**50**	40	40	**22**	10.4	6.3	20	18	11	7	0.29	1
	2063F	●	**63**	50	40	**22**	10.4	6.3	20	18	11	8	0.51	1

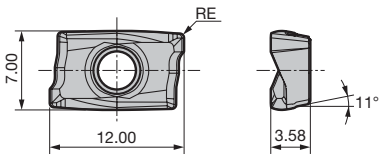
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light	P			K		M S		K N	N		
	General-purpose		P M	P M	K		M S	M S		N		
	Roughing		P M	P M		K		M S				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 123504PEER-G		●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-G		●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-G		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-H		●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-H		●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-H		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-E		—	—	—	—	—	●	●	—	—	0.4	1
123508PEER-E		—	—	—	—	—	●	●	—	—	0.8	1
123512PEER-E		—	—	—	—	—	●	●	—	—	1.2	1
AXMT 123508PEER-EH		—	—	—	—	—	●	●	—	—	0.8	1
AXET 123502PEFR-S		—	—	—	—	—	—	—	●	●	0.2	1
123504PEFR-S		—	—	—	—	—	—	—	●	●	0.4	1
123508PEFR-S		—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



-G: General-purpose, -H: Strong Edge, -E, -EH: Exotic Alloy, -S: Aluminum Alloy.

Recommended Cutting Conditions H88

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0306IP	**2.0**	TRDR08IP	SUMI-P

Identification Code

WEX Series Code | **2** Insert Size | **040** Dia. | **F** Metric Bore

WEX 3000F/R type WEXF 3000R type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	12° to 15°
	Axial	19° to 24°

14mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

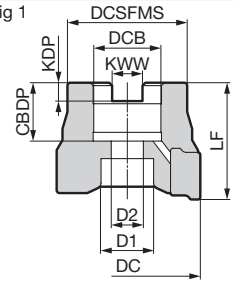
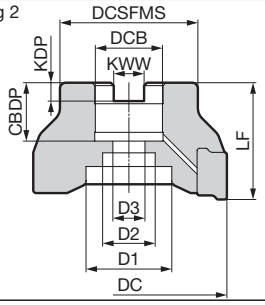


Fig 2



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Number of Teeth	Weight (kg)	Fig
Metric	WEX 3040F	●	40	32	40	16	8.4	5.6	18	14	9	—	4	0.16	1
	3050F	●	50	40	40	22	10.4	6.3	20	18	11	—	5	0.25	1
	3063F	●	63	50	40	22	10.4	6.3	20	18	11	—	6	0.48	1
Inch	WEX 3080R	●	*80	60	50	25.4	9.5	6	25	35	26	13.5	4	1.06	2
	3100R	●	*100	70	63	31.75	12.7	8	32.5	46	28	17	5	1.99	2
	3125R	●	125	80	63	38.1	15.9	10	35.5	55	30	—	6	2.89	1

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Number of Teeth	Weight (kg)	Fig
Inch	WEXF 3080R	●	*80	60	50	25.4	9.5	6	25	35	26	13.5	7	0.98	2
	3100R	●	*100	70	63	31.75	12.7	8	32.5	46	28	17	8	1.91	2
	3125R	●	125	80	63	38.1	15.9	10	35.5	55	30	—	9	2.80	1

Inserts are sold separately.

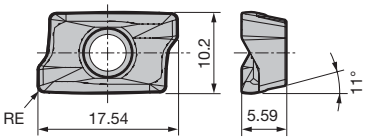
Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light Cutting	P			K		M S		K N	N		
	General-purpose		P M	P M	K		M S	M S		N		
	Roughing		P M	P M		K		M S				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 170508PEER-L		●	●	●	●	●	—	—	—	—	0.8	1
AXMT 170504PEER-G		●	●	●	●	●	—	—	—	—	0.4	1
170508PEER-G		●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-G		●	●	●	●	●	—	—	—	—	1.2	1
170516PEER-G		●	●	●	●	●	—	—	—	—	1.6	1
170520PEER-G*		●	●	●	●	●	—	—	—	—	2.0	1
170530PEER-G*		●	●	●	●	●	—	—	—	—	3.0	1
AXMT 170508PEER-H		●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-H		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 170504PEER-E		—	—	—	—	—	●	●	—	—	0.4	1
170508PEER-E		—	—	—	—	—	●	●	—	—	0.8	1
170512PEER-E		—	—	—	—	—	●	●	—	—	1.2	1
170516PEER-E		—	—	—	—	—	●	●	—	—	1.6	1
170520PEER-E*		—	—	—	—	—	●	●	—	—	2.0	1
170530PEER-E*		—	—	—	—	—	●	●	—	—	3.0	1
AXMT 170508PEER-EH		—	—	—	—	—	●	●	—	—	0.8	1
AXET 170502PEFR-S		—	—	—	—	—	—	—	●	●	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	●	●	0.4	1
170508PEFR-S		—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



-L: Low Cutting force, -G: General-purpose, -H: Strong Edge, -E, -EH: Exotic Alloy, -S: Aluminum Alloy.

* marked inserts require modification of the cutter body.

Recommended Cutting Conditions H89

Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure Cream
		Handle Grip	Bit	
BFTX0409IP	3.0	HPS1015	TRB15IP	SUMI-P

Identification Code

WEX 3 040 F

WEX	3	040	F
Series Code	Insert Size	Dia.	F: Metric Bore R: Inch Bore

*Modification of the cutter body is required when using inserts with corner radius RE 2.0 or 3.0

Modify this portion.

Reworking guidelines

For Corner Radius RE 2.0: C1 (AXMT170520PEER)

For Corner Radius RE 3.0: C1.5 (AXMT170530PEER)

Standard: C0.5.

N·m Recommended Tightening Torque (N·m)

WEX 1000E/EL type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	7° to 17°
	Axial	9° to 17°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

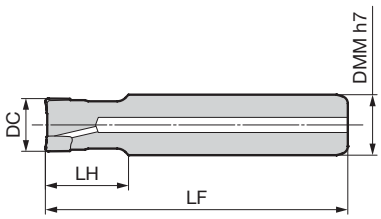
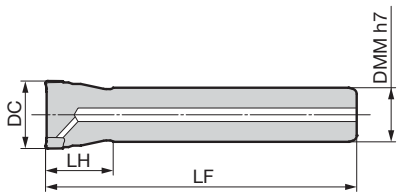


Fig 2



Body (Shank type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
Metric	**WEX 1010E**	●	**10**	10	17	50	2	0.03	1
	1012E	●	**12**	12	20	80	3	0.06	1
	1014E	●	**14**	16	22	80	3	0.10	1
	1016E	●	**16**	16	20	90	4	0.12	1
	1018E	●	**18**	20	22	100	4	0.21	1
	1020E	●	**20**	20	22	100	5	0.22	1
	1025E	●	**25**	20	25	115	7	0.27	2

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Body (Long Shank type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
Metric	**WEX 1010EL**	●	**10**	8	17	100	2	0.03	2
	1012EL	●	**12**	10	20	120	2	0.06	2
	1014EL	●	**14**	12	20	145	3	0.11	2
	1016EL	●	**16**	14	20	160	3	0.17	2
	1018EL	●	**18**	16	20	180	3	0.25	2
	1020EL	●	**20**	18	25	200	4	0.36	2

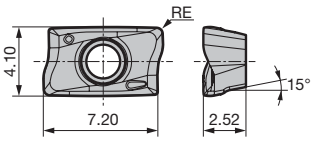
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light Cutting	P			K		MS		N	N		
	General-purpose		PM	PM	K		MS	MS		N		
	Roughing		PM	PM		K		MS				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 060204PDER-L		●	●	●	●	●	●	●	—	—	0.4	1
060208PDER-L		●	●	●	●	●	●	●	—	—	0.8	1
060212PDER-L		●	●	●	●	●	●	●	—	—	1.2	1
AXMT 060202PDER-G		●	●	●	●	●	●	●	—	—	0.2	1
060204PDER-G		●	●	●	●	●	●	●	—	—	0.4	1
060208PDER-G		●	●	●	●	●	●	●	—	—	0.8	1
060212PDER-G		●	●	●	●	●	●	●	—	—	1.2	1
AXMT 060204PDER-H		●	●	●	●	●	●	●	—	—	0.4	1
060208PDER-H		●	●	●	●	●	●	●	—	—	0.8	1
060212PDER-H		●	●	●	●	●	●	●	—	—	1.2	1
AXMT 060202PDFR-S		—	—	—	—	—	—	—	●	●	0.2	1

Fig 1



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge, -S: Aluminum Alloy.

Recommended Cutting Conditions H88

Identification Code

WEX **1** **010** **E** **L**

Series Code	Insert Size	Dia.	Shank type	Long type
WEX	1	010	E	L

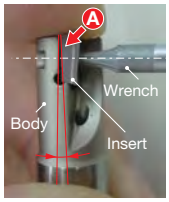
Parts

(Sold Separately)

Flat Insert Screw		Wrench	Anti-seizure Cream	Torque Wrench
				0.5N·m
BFTX01804IP	0.5	TRX06IP	SUMI-P	TRDR06IP05

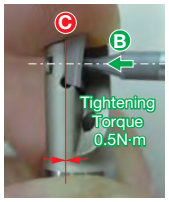
Precautions when Mounting WEX1000 Inserts

1



Press the top of the insert in the direction of A.

2



Hold down as shown in C so that there is no gap between the insert bottom and the base of insert pocket, and tighten with wrench B (tightening torque 0.5N·m)

A dedicated torque wrench is optionally available (sold separately).

WEX 2000E/EL type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	10° to 18°
	Axial	14° to 25°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

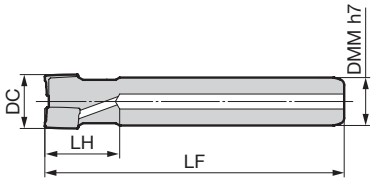
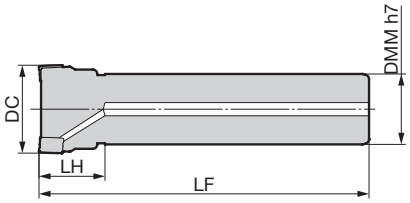


Fig 2



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEX 2014E	●	**14**	16	25	80	1	0.10	1
2016E	●	**16**	16	25	100	2	0.13	1
2018E	●	**18**	16	25	100	2	0.14	2
2020E	●	**20**	20	30	110	3	0.22	1
2022E	●	**22**	20	30	110	3	0.23	2
2025E	●	**25**	25	35	120	4	0.38	1
2028E	●	**28**	25	35	120	4	0.39	2
2030E	●	**30**	25	35	120	4	0.40	2
2032E	●	**32**	32	40	130	5	0.70	1
2040E	●	**40**	32	30	150	6	0.91	2
2050E	●	**50**	32	30	150	7	1.02	2
2063E	●	**63**	32	30	150	8	1.22	2

Inserts are sold separately.

Body (Long Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEX 2014EL	●	**14**	16	25	120	1	0.14	1
2016EL	●	**16**	16	25	145	2	0.19	1
2018EL	●	**18**	16	25	145	2	0.19	2
2020EL	●	**20**	20	40	150	2	0.32	1
2022EL	●	**22**	20	30	150	2	0.33	2
2025EL	●	**25**	25	50	170	2	0.55	1
2028EL	●	**28**	25	30	170	2	0.59	2
2030EL	●	**30**	25	30	170	2	0.60	2
2032EL	●	**32**	32	60	180	2	0.99	1
2040EL	●	**40**	32	30	180	2	1.12	2

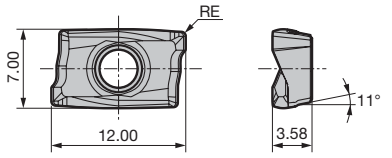
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light Cutting	P			K		M S		K N	N		
	General-purpose		P M	P M	K		M S	M S		N		
	Roughing		P M	P M		K		M S				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 123504PEER-G		●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-G		●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-G		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-H		●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-H		●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-H		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-E		—	—	—	—	—	●	●	—	—	0.4	1
123508PEER-E		—	—	—	—	—	●	●	—	—	0.8	1
123512PEER-E		—	—	—	—	—	●	●	—	—	1.2	1
AXMT 123508PEER-EH		—	—	—	—	—	●	●	—	—	0.8	1
AXET 123502PEFR-S		—	—	—	—	—	—	—	●	●	0.2	1
123504PEFR-S		—	—	—	—	—	—	—	●	●	0.4	1
123508PEFR-S		—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



-G: General-purpose, -H: Strong Edge, -E, -EH: Exotic Alloy, -S: Aluminum Alloy.

Recommended Cutting Conditions H88

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEX2014E(EL) to WEX2018E(EL)	BFTX0305IP	2.0	TRDR08IP	SUMI-P
WEX2020E(EL) to WEX2063E	BFTX0306IP	2.0	TRDR08IP	SUMI-P

Identification Code

WEX **2** **014** **E** **L**

Series Code	Insert Size	Dia.	Shank type	Long type

N·m Recommended Tightening Torque (N·m)

WEX 3000 E/ES/EL/E-C/ES-C type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	8° to 15°
	Axial	16° to 24°

14mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1

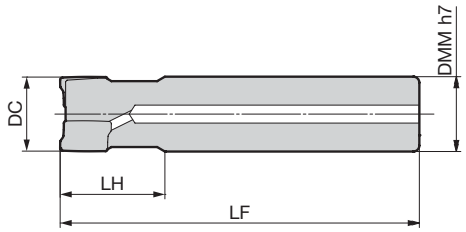
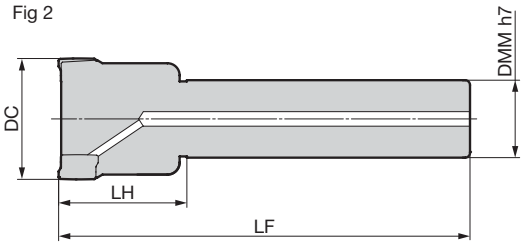


Fig 2



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEX 3025E-20	●	25	20	35	120	2	0.25	2
3025E	●	25	25	35	120	2	0.37	1
3028E	●	28	25	35	120	2	0.39	2
3030E	●	30	25	40	130	3	0.42	2
3032E-25	●	32	25	40	130	3	0.43	2
3032E	●	32	32	40	130	3	0.67	1
3035E	●	35	32	40	130	3	0.69	2
3040E	●	40	32	50	170	4	1.01	2
3050E	●	50	32	50	170	5	1.23	2
3063E	●	63	32	50	170	6	1.58	2

Body (Short Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEX 3050ES	●	50	32	25	135	5	0.86	2
3050ES-42	●	50	42	25	135	5	1.36	2
3063ES	●	63	32	25	135	6	1.02	2
3063ES-42	●	63	42	25	135	6	1.52	2

Inserts are sold separately.

Body (Long Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEX 3025EL	●	25	25	50	170	2	0.54	1
3028EL	●	28	25	50	170	2	0.56	2
3030EL	●	30	25	60	180	2	0.60	2
3032EL	●	32	32	60	180	2	0.95	1
3035EL	●	35	32	60	180	2	0.98	2
3040EL	●	40	32	80	220	2	1.38	2

Body (Coarse Pitch type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEX 3040E-C	●	40	32	50	170	3	1.04	2
3050E-C	●	50	32	50	170	3	1.28	2
3063E-C	●	63	32	50	170	4	1.64	2

Body (Short Coarse Pitch type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WEX 3050ES-C	●	50	32	25	135	3	0.91	2
3050ES-C-42	●	50	42	25	135	3	1.41	2
3063ES-C	●	63	32	25	135	4	1.07	2
3063ES-C-42	●	63	42	25	135	4	1.57	2

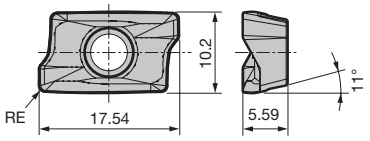
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light Cutting	P			K		M S		K N	N		
	General-purpose		P M	P M	K		M S	M S		N		
	Roughing		P M	P M		K		M S				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 170508PEER-L		●	●	●	●	●	—	—	—	—	0.8	1
AXMT 170504PEER-G		●	●	●	●	●	—	—	—	—	0.4	1
170508PEER-G		●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-G		●	●	●	●	●	—	—	—	—	1.2	1
170516PEER-G		●	●	●	●	●	—	—	—	—	1.6	1
170520PEER-G*		●	●	●	●	●	—	—	—	—	2.0	1
170530PEER-G*		●	●	●	●	●	—	—	—	—	3.0	1
AXMT 170508PEER-H		●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-H		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 170504PEER-E		—	—	—	—	—	●	●	—	—	0.4	1
170508PEER-E		—	—	—	—	—	●	●	—	—	0.8	1
170512PEER-E		—	—	—	—	—	●	●	—	—	1.2	1
170516PEER-E		—	—	—	—	—	●	●	—	—	1.6	1
170520PEER-E*		—	—	—	—	—	●	●	—	—	2.0	1
170530PEER-E*		—	—	—	—	—	●	●	—	—	3.0	1
AXMT 170508PEER-EH		—	—	—	—	—	●	●	—	—	0.8	1
AXET 170502PEFR-S		—	—	—	—	—	—	—	●	●	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	●	●	0.4	1
170508PEFR-S		—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



-L: Low Cutting force, -G: General-purpose, -H: Strong Edge, -E, -EH: Exotic Alloy, -S: Aluminum Alloy.
* marked inserts require modification of the cutter body.

Recommended Cutting Conditions H89

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEX3025E(EL) to 3030EL	BFTX0407IP	3.0	TRDR15IP	SUMI-P
WEX3032E(EL) to 3063E(ES)	BFTX0409IP	3.0	TRDR15IP	SUMI-P

*Modification of the cutter body is required when using inserts with corner radius RE 2.0 or 3.0

Modify this portion.
Reworking guidelines
For Corner Radius RE 2.0: C1 (AXMT170520PEER)
For Corner Radius RE 3.0: C1.5 (AXMT170530PEER)
Standard: C0.5.

N·m Recommended Tightening Torque (N·m)

WRX series

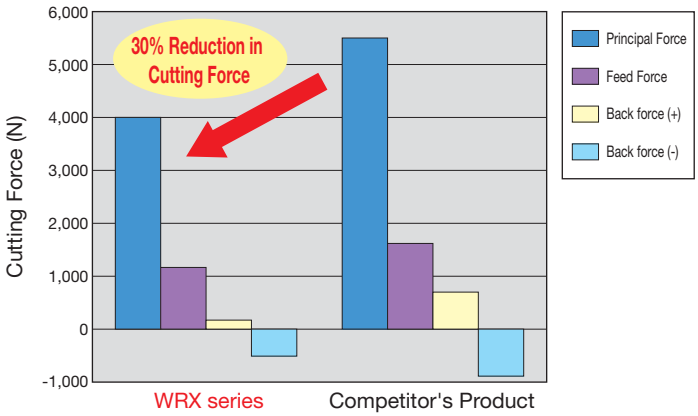
High-efficiency Shoulder Milling of Deep Steps

■ Features

Inserts for SEC-WaveMill WEX series, with wave-like cutting edges, are arranged in multiple stages forming a long cutting edge to enable high-efficiency shoulder milling of deep steps.

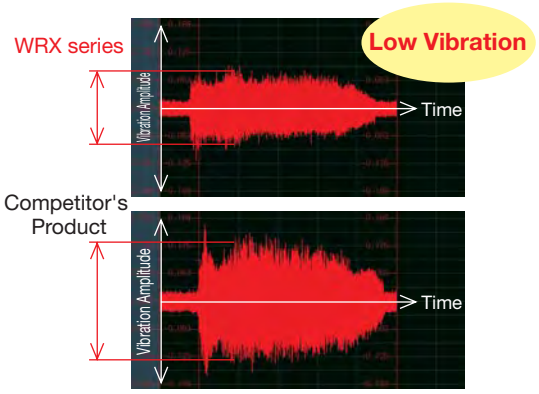
● Cutting edge positions are optimised to provide low cutting force and low vibration.

■ Comparison of Cutting Force



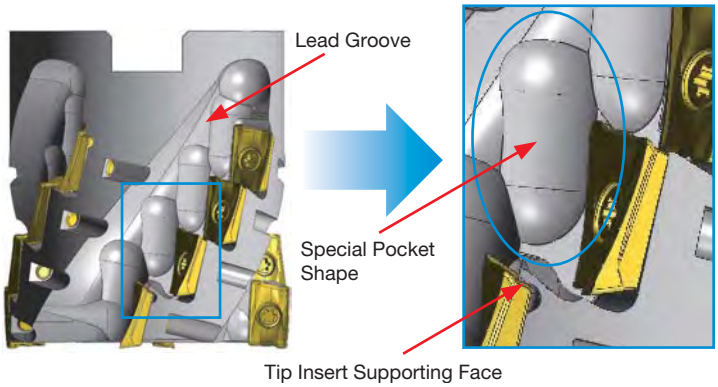
Cutting Conditions
Work Material : S50C
Tool : WRX2025E2725
Cutting Speed : vc = 100m/min, fz = 0.15mm/t, ae = 10mm, ap = 25mm, Dry

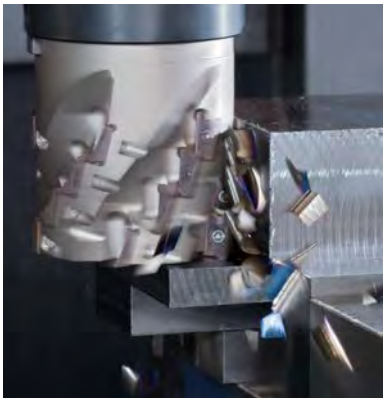
■ Comparison of Vibration



Cutting Conditions
Work Material : S50C
Tool : WRX3080RS5332
Cutting Speed : vc = 150m/min, fz = 0.20mm/t,ae = 5mm,ap = 40mm, Dry

● Lead groove and special pocket shape provide smooth chip evacuation and high body rigidity
● Tip insert supporting face reduces bottom edge fracture and provides high reliability.





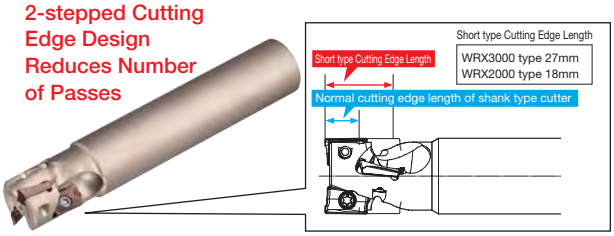
■ Product Range

Cutting Edge	Series Code	Cutting Edge Length (mm)	Dia. (mm)	Shape	Applicable Inserts (*)
Standard type	WRX2000E	27 to 36	ø20 to ø40	Shank type	AXMT1235 type
	WRX2000R	36	ø40 to ø50	Mounting Hole type	
	WRX3000E	40 to 53	ø40 to ø50	Shank type	AXMT1705 type
	WRX3000R	53	ø50 to ø100	Mounting Hole type	
Short Cutting Edge type	WRX2000E	18	ø20 to ø40	Shank type	AXMT1235 type
	WRX2000R		ø40 to ø50	Mounting Hole type	
	WRX3000E	27	ø40 to ø50	Shank type	AXMT1705 type
	WRX3000R		ø50 to ø100	Mounting Hole type	

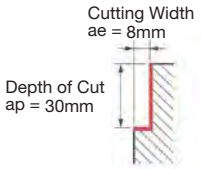
* Applicable inserts are common with the popular WEX type SEC-WaveMill

Short Cutting Edge Series

2-stepped Cutting Edge Design Reduces Number of Passes



■ Recommended Cutting Conditions



WRX2000

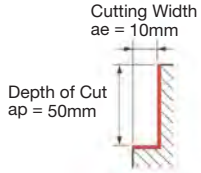
Tool: WRX2040E3642, Insert: AXMT123504PEER

Cutting Conditions: Depth of Cut ap = 30mm, Width of Cut ae = 8mm, Dry

ISO Classification	Work Material		Workpiece Hardness (HB)	Chipbreaker	Grade																							
					ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
					Feed Rate per Tooth fz (mm/t)																							
					0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2
					Cutting Speed vc (m/min)																							
P	Steel, Carbon Steel	S15C	125	G	280	260	240	260	240	220	240	220	200															
		S45C	190	G	200	180	160	180	160	140	180	160	140															
		S45C Hardened	250	G	180	120	140	160	140	120	150	130	110															
		S75C	270	G	160	140	120	150	130	110	130	110	110															
		S75C Hardened	300	G	100	80	70	90	70	60	70	60	50															
	Low Alloy Steel	(SCM, SNCM)	180	G	200	180	160	180	160	150	160	150	130															
		SCM, SNCM Hardened	275	G	130	110	90	120	100	90	100	90	80															
		SCM, SNCM Hardened	300	G	120	100	80	100	90	80	90	80	60															
		SCM, SNCM Hardened	350	G	90	80	60	80	70	60	70	60	40															
	High Alloy Steel	(SKD, SKT, SKH)	200	G	180	170	160	170	160	130	150	140	120															
		SKD, SKT, SKH Hardened	325	G	100	80	60	80	60	50	60	50	30															
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200	E																170	150	120	140	130	110			
		SUS403 and Others (Martensitic/Hardened)	240	E																140	120	100	120	100	90			
		SUS304, SUS316 (Austenitic)	180	E																180	160	140	160	140	130			
K	Cast Iron			G										240	220	200	220	200	180									
	Ductile Cast Iron			G										160	140	120	140	120	100									
S	Exotic Alloy			E																50	35		45	25				
N	Aluminum Alloy	Si content of 12.6% or less		S																						1000	750	500
		Si content of over 12.6%		S																						250	200	170

● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, workpiece shape, clamping system).

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.



WRX3000

Tool: WRX3050E5342 Insert: AXMT170508PEER

Cutting Conditions: Depth of Cut ap = 50mm, Width of Cut ae = 10mm, Dry

ISO Classification	Work Material		Workpiece Hardness (HB)	Chipbreaker	Grade																							
					ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
					Feed Rate per Tooth fz (mm/t)																							
					0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2	0.1	0.15	0.2
					Cutting Speed vc (m/min)																							
P	Steel, Carbon Steel	S15C	125	G	320	300	280	300	280	260	280	260	240															
		S45C	190	G	240	220	200	220	200	180	200	180	160															
		S45C Hardened	250	G	200	180	160	180	160	140	160	140	120															
		S75C	270	G	160	140	120	150	130	110	130	110	110															
		S75C Hardened	300	G	120	100	80	100	80	60	80	60	50															
	Low Alloy Steel	(SCM, SNCM)	180	G	220	200	180	200	180	170	180	170	150															
		SCM, SNCM Hardened	275	G	140	120	100	130	110	100	110	100	80															
		SCM, SNCM Hardened	300	G	130	110	90	110	90	80	100	80	60															
		SCM, SNCM Hardened	350	G	100	80	60	90	70	60	70	60	40															
	High Alloy Steel	(SKD, SKT, SKH)	200	G	200	180	160	180	160	140	160	140	120															
		SKD, SKT, SKH Hardened	325	G	100	80	60	80	60	50	60	50	30															
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200	E																170	150	130	140	130	110			
		SUS403 and Others (Martensitic/Hardened)	240	E																140	120	100	120	100	90			
		SUS304, SUS316 (Austenitic)	180	E																180	160	140	160	140	130			
K	Cast Iron			G										240	220	200	220	200	180									
	Ductile Cast Iron			G										160	140	120	140	120	100									
S	Exotic Alloy			E																50	30		45	25				
N	Aluminum Alloy	Si content of 12.6% or less		S																						1000	750	500
		Si content of over 12.6%		S																						250	200	170

● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, workpiece shape, clamping system).

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WRX 2000RS type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	16° to 17°
	Axial	24°

18 to 36 mm | 90°

Shoulder Milling | Groove Milling | Side Milling

Fig 1

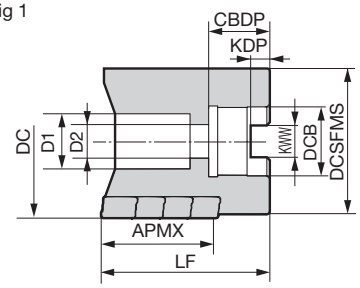
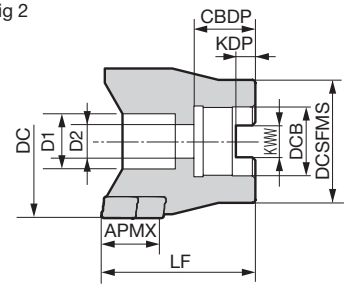


Fig 2



Body (Standard type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
Metric	**WRX 2040RS3616**	●	**40**	36	37.5	55	**16**	8.4	5.6	18	14	9	16	4	4	0.3	1
	2050RS3622	●	**50**	36	47.5	55	**22**	10.4	6.3	20	18	11	16	4	4	0.5	1

Body (Short Cutting Edge type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
Metric	**WRX 2040RS1816**	●	**40**	18	32	50	**16**	8.4	5.6	18	14	9	10	2	5	0.3	2
	2050RS1822	●	**50**	18	40	50	**22**	10.4	6.3	20	18	11	10	2	5	0.4	2

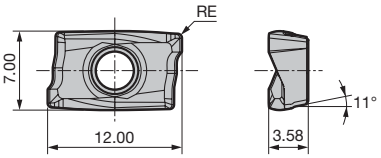
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light Cutting	P			K		M S		K N	N		
	General-purpose		P M	P M	K		M S	M S		N		
	Roughing		P M	P M		K		M S				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 123504PEER-G		●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-G		●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-G		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-H		●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-H		●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-H		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-E		—	—	—	—	—	●	●	—	—	0.4	1
123508PEER-E		—	—	—	—	—	●	●	—	—	0.8	1
123512PEER-E		—	—	—	—	—	●	●	—	—	1.2	1
AXMT 123508PEER-EH		—	—	—	—	—	●	●	—	—	0.8	1
AXET 123502PEFR-S		—	—	—	—	—	—	—	●	●	0.2	1
123504PEFR-S		—	—	—	—	—	—	—	●	●	0.4	1
123508PEFR-S		—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



-G: General-purpose, -H: Strong Edge, -E, -EH: Exotic Alloy, -S: Aluminum Alloy.

Recommended Cutting Conditions H97

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0306IP	2.0	TRDR08IP	SUMI-P

* Use peripheral inserts with RE of 0.8mm or less from the second step and above.

Identification Code

WRX **2** **040** **R** **S** **36** **16**

Series Code	Insert Size	Dia.	Feed Direction	Metric Bore	Cutting Edge Length	Mounting Hole Diameter
WRX	2	040	R	S	36	16

N·m Recommended Tightening Torque (N·m)

WRX 3000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	13° to 15°
	Axial	22° to 24°

27 to 53mm | 90°

Shoulder Milling | Groove Milling | Side Milling

Fig 1

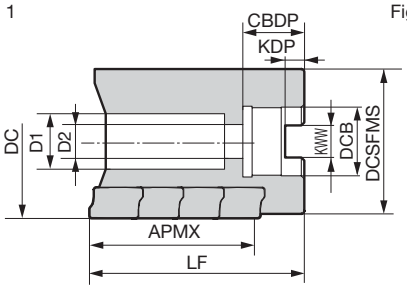


Fig 2

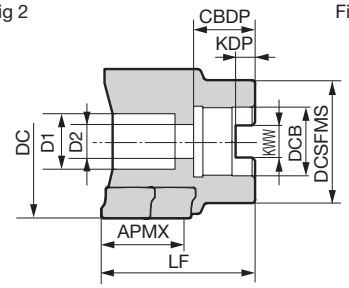
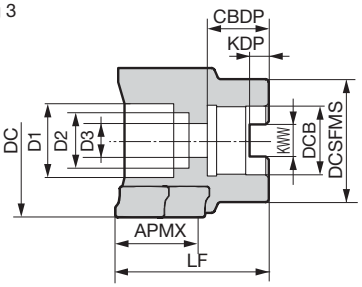


Fig 3



Body (Standard type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
Metric	**WRX 3050RS5322**	●	**50**	53	47	70	**22**	10.4	6.3	20	18	11	—	12	4	3	0.6	1
	3063RS5327	●	**63**	53	60	70	**27**	12.4	7	23	20	13.5	—	16	4	4	1.0	1
	3080RS5332	●	**80**	53	77	85	**32**	14.4	8	26	25	17	—	20	4	5	2.2	1
	3100RS5340	●	**100**	53	97	85	**40**	16.4	9.5	30	32	21	—	24	4	6	3.5	1

Body (Short Cutting Edge type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
Metric	**WRX 3050RS2722**	●	**50**	27	40	50	**22**	10.4	6.3	20	18	11	—	8	2	4	0.4	2
	3063RS2722	●	**63**	27	50	50	**22**	10.4	6.3	20	18	11	—	10	2	5	0.7	2

Body (Short Cutting Edge type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
Inch	**WRX 3080R27254**	●	**80	27	60	50	**25.4**	9.5	6	25	35	26	13	12	2	6	1.1	3
	3100R27317	●	**100	27	70	63	**31.75**	12.7	8	32.5	46	28	17	14	2	7	2.0	3

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

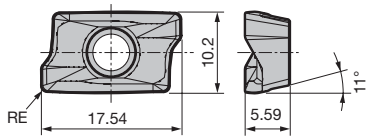
Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC
Process	High-speed/Light Cutting	P			K		M S		K N	N
	General-purpose		P M	P M	K		M S	M S		N
	Roughing		P M	P M		K		M S		

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 170508PEER-L	●	●	●	●	●	—	—	—	—	0.8	1
AXMT 170504PEER-G	●	●	●	●	●	—	—	—	—	0.4	1
170508PEER-G	●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-G	●	●	●	●	●	—	—	—	—	1.2	1
170516PEER-G	●	●	●	●	●	—	—	—	—	1.6	1
170520PEER-G*	●	●	●	●	●	—	—	—	—	2.0	1
170530PEER-G*	●	●	●	●	●	—	—	—	—	3.0	1
AXMT 170508PEER-H	●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-H	●	●	●	●	●	—	—	—	—	1.2	1
AXMT 170504PEER-E	—	—	—	—	—	●	●	—	—	0.4	1
170508PEER-E	—	—	—	—	—	●	●	—	—	0.8	1
170512PEER-E	—	—	—	—	—	●	●	—	—	1.2	1
170516PEER-E	—	—	—	—	—	●	●	—	—	1.6	1
170520PEER-E*	—	—	—	—	—	●	●	—	—	2.0	1
170530PEER-E*	—	—	—	—	—	●	●	—	—	3.0	1
AXMT 170508PEER-EH	—	—	—	—	—	●	●	—	—	0.8	1
AXET 170502PEFR-S	—	—	—	—	—	—	—	●	●	0.2	1
170504PEFR-S	—	—	—	—	—	—	—	●	●	0.4	1
170508PEFR-S	—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



* marked inserts require modification of the cutter body.

Recommended Cutting Conditions H97

Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure
		Handle Grip	Bit	Cream
BFTX0409IP	**3.0**	HPS1015	TRB15IP	SUMI-P

* Use peripheral inserts with RE of 0.8mm or less from the second step and above.

*Modification of the cutter body is required when using inserts with corner radius RE 2.0 or 3.0

Modify this portion.

Reworking guidelines

For RE = 2.0: C1 (AXMT170520PEER)

For RE = 3.0: C1.5 (AXMT170530PEER)

Standard: C0.5.

(N·m) Recommended Tightening Torque (N·m)

WRX 2000E type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

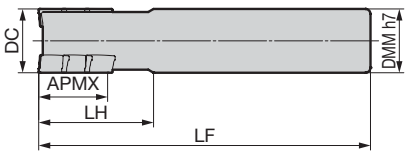
Rake Angle		
	Radial	13° to 16°
	Axial	16° to 24°

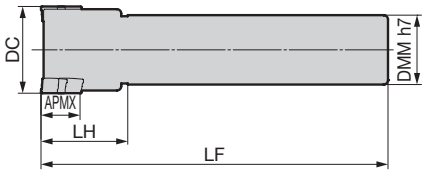
18 to 36 mm | 90°

Shoulder Milling | Groove Milling | Side Milling

Fig 1

Fig 2





Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
WRX 2020E3620	●	**20**	36	20	45	130	4	4	1	0.3	1
2025E2725	●	**25**	27	25	45	130	6	3	2	0.4	1
2032E2732	●	**32**	27	32	45	130	9	3	3	0.7	1
2040E3642	●	**40**	36	42	45	130	16	4	4	1.2	1

Body (Short Cutting Edge type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
WRX 2020E1820	●	**20**	18	20	40	120	4	2	2	0.3	1
2025E1825	●	**25**	18	25	45	130	6	2	3	0.4	1
2032E1832	●	**32**	18	32	50	140	8	2	4	0.8	1
2040E1832	●	**40**	18	32	40	160	10	2	5	1.1	2

Note: The values in red have been changed from the 2021-2022 General Catalogue.

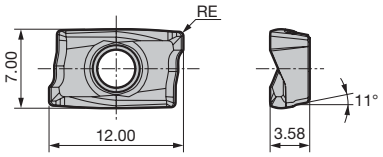
Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC
Process	High-speed/Light Cutting	P			K		M S		K N	N
	General-purpose		P M	P M	K		M S	M S		N
	Roughing		P M	P M		K		M S		

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 123504PEER-G	●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-G	●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-G	●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-H	●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-H	●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-H	●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-E	—	—	—	—	—	●	●	—	—	0.4	1
123508PEER-E	—	—	—	—	—	●	●	—	—	0.8	1
123512PEER-E	—	—	—	—	—	●	●	—	—	1.2	1
AXMT 123508PEER-EH	—	—	—	—	—	●	●	—	—	0.8	1
AXET 123502PEFR-S	—	—	—	—	—	—	—	●	●	0.2	1
123504PEFR-S	—	—	—	—	—	—	—	●	●	0.4	1
123508PEFR-S	—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



-G: General-purpose, -H: Strong Edge, -E, -EH: Exotic Alloy, -S: Aluminum Alloy.

Recommended Cutting Conditions H97

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0306IP	**2.0**	TRDR08IP	SUMI-P

* Use peripheral inserts with RE of 0.8mm or less from the second step and above.

Identification Code

WRX	2	020	E	36	20
Series Code	Insert Size	Dia.	Shank type	Cutting Edge Length	Shank Dia.

N·m Recommended Tightening Torque (N·m)

WRX 3000E type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	12° to 13°
	Axial	20° to 22°

27 to 53mm | 90°

Shoulder Milling | Groove Milling | Side Milling

Fig 1

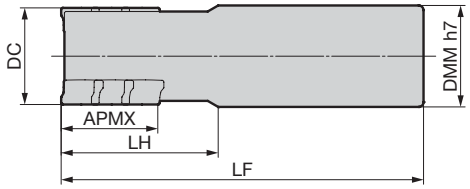
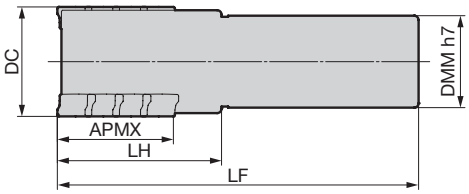


Fig 2



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
WRX 3040E4042	●	**40**	40	42	65	150	9	3	3	1.3	1
3050E5342	●	**50**	53	42	75	165	12	4	3	1.8	2

Body (Short Cutting Edge type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	No. of Steps	Effective No. of Teeth	Weight (kg)	Fig
WRX 3040E2732	●	**40**	27	32	60	180	6	2	3	1.2	2
3050E2732	●	**50**	27	32	60	180	8	2	4	1.4	2

Inserts are sold separately.

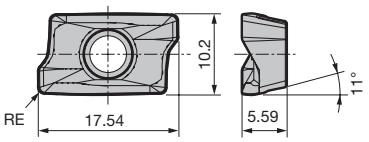
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light Cutting	P			K		M S		K N	N		
	General-purpose		P M	P M	K		M S	M S		N		
	Roughing		P M	P M		K		M S				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 170508PEER-L		●	●	●	●	●	—	—	—	—	0.8	1
AXMT 170504PEER-G		●	●	●	●	●	—	—	—	—	0.4	1
170508PEER-G		●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-G		●	●	●	●	●	—	—	—	—	1.2	1
170516PEER-G		●	●	●	●	●	—	—	—	—	1.6	1
170520PEER-G*		●	●	●	●	●	—	—	—	—	2.0	1
170530PEER-G*		●	●	●	●	●	—	—	—	—	3.0	1
AXMT 170508PEER-H		●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-H		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 170504PEER-E		—	—	—	—	—	●	●	—	—	0.4	1
170508PEER-E		—	—	—	—	—	●	●	—	—	0.8	1
170512PEER-E		—	—	—	—	—	●	●	—	—	1.2	1
170516PEER-E		—	—	—	—	—	●	●	—	—	1.6	1
170520PEER-E*		—	—	—	—	—	●	●	—	—	2.0	1
170530PEER-E*		—	—	—	—	—	●	●	—	—	3.0	1
AXMT 170508PEER-EH		—	—	—	—	—	●	●	—	—	0.8	1
AXET 170502PEFR-S		—	—	—	—	—	—	—	●	●	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	●	●	0.4	1
170508PEFR-S		—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



* marked inserts require modification of the cutter body.

Recommended Cutting Conditions H97

Identification Code

WRX **3** **040** **E** **40** **42**

Series Code	Insert Size	Dia.	Shank type	Cutting Edge Length	Shank Dia.

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0409IP	**3.0**	TRDR15IP	SUMI-P

* Use peripheral inserts with RE of 0.8mm or less from the second step and above.

***Modification of the cutter body is required when using inserts with corner radius RE 2.0 or 3.0**

Modify this portion.

Reworking guidelines

For RE = 2.0: C1
(AXMT170520PEER)

For RE = 3.0: C1.5
(AXMT170530PEER)

Standard: C0.5.

N·m Recommended Tightening Torque (N·m)

WSE series

New

■ Features

- Ideal for machining titanium alloys for aerospace
  Designed for machining at large ramping angles, coupled with a selection of corner radiuses, makes it applicable for a variety of applications including titanium structural parts
- Stable and long tool life in machining titanium alloys
  The optimised cutting edge shape together with newly developed ACS2500/ACS3000 grades (for machining exotic alloys) result in excellent wear resistance and fracture resistance
- Optimized cutting edge shape and chip pocket for excellent chip evacuation

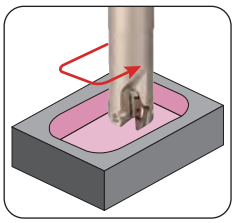
■ Product Range

Type	Description	Cat. No.	Dia. (mm)		
			ø32	ø50	ø63
Shell	Standard	**WSE 16000RS○○**		5	6
	Long	**WSE 16000RS○○L**		5	6
Shank	Standard	**WSE 16000E○○**	3		

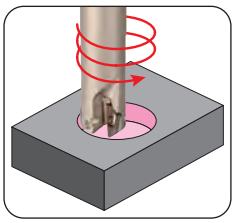
Number in ●● shows the number of teeth

■ Applicable to various applications!

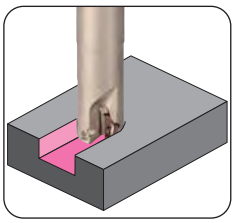
Pocket Expansion



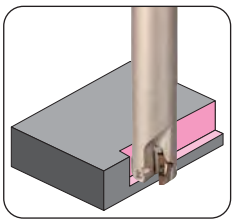
Helical Milling



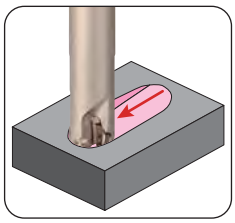
Groove Milling



Shoulder Milling

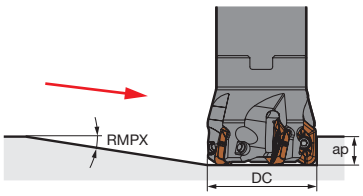


Ramping

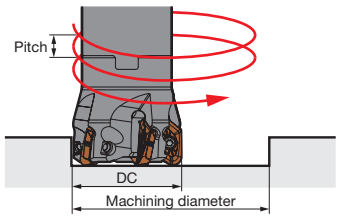


■ Ramping/Helical Milling Upper Limit

Ramping



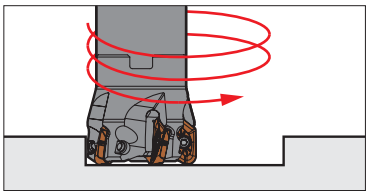
Helical Milling



Dia. DC ø (mm)	Corner Radius RE	Max. Ramping Angle RMPX(°)
32	RE ≥ 5.0	8.4
	RE ≤ 4.0	12.2
50	RE ≥ 5.0	3.6
	RE ≤ 4.0	5.6
63	RE ≥ 5.0	2.5
	RE ≤ 4.0	3.9

Dia. DC ø (mm)	Corner Radius RE	Max. Machining Dia. ø (mm)	Max. Pitch (mm/rev)	Standard Diameter ø (mm)	Max. Pitch (mm/rev)	Min. Machining Dia. ø (mm)	Max. Pitch (mm/rev)
32	4.0	55.3	13.0	55.2	13.0	45.9	3.0
	0.8	61.3	13.0	56.3	13.0	45.9	2.9
50	4.0	91.6	11.2	91.6	11.2	81.9	2.8
	0.8	97.3	13.0	92.2	11.0	81.9	2.7
63	4.0	117.6	10.1	117.6	10.1	107.9	2.7
	0.8	123.3	11.7	118.2	9.9	107.9	2.6

Precautions for Helical Milling



Helical Milling

- For helical milling, if the work diameter is smaller than the standard diameter, there will be a centre uncut portion.
- A prepared centre hole should be made.
- Above the standard diameter, this portion can be removed by traverse cutting with the same cutter.

■ Grade Features

Work Material	Grade	Coating Thickness (μm)	Features
S Exotic Alloy M Stainless Steel	ACS2500	3	Carbide substrate with excellent wear and adhesion resistance, coupled with a chipping resistant coating, provide outstanding performance especially in machining titanium alloys
S Exotic Alloy M Stainless Steel	ACS3000	3	High toughness carbide substrate and a coating with excellent chipping resistance provide outstanding stability when machining titanium alloys, heat-resistant alloys or stainless steel

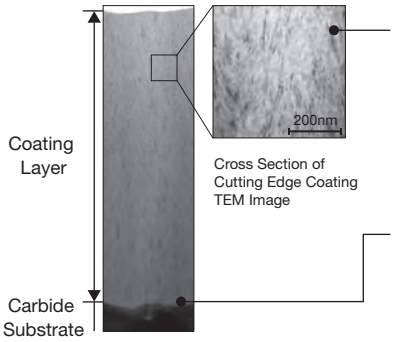
■ Grade Application Range

The newly developed ACS2500/ACS3000 grades ideal for machining titanium alloys, heat-resistant alloys and stainless steel are now available!

Work Material		Finishing to Light Cutting	Medium Cutting	Rough to Heavy Cutting
S Exotic Alloy M Stainless Steel	Coated Carbide	ACS2500		
S Exotic Alloy M Stainless Steel	Coated Carbide		ACS3000	

New PVD Coating Layer Features

ABSOTECH PVD



Cross Section of Cutting Edge Coating TEM Image

Ultra-fine Grained B Additive
·New AlTiBN coating, with an ultra-fine coating structure, achieves high strength and toughness
·Outstanding chipping resistance and wear resistance

High Adhesion Strength
Significantly improved coating adhesion and more than 2x conventional chipping resistance

■ Chipbreaker Shape

Work Material	M Stainless Steel, S Exotic Alloy
Applications	General-purpose to Roughing
Features	Standard
Chipbreaker	E type
Cutting Edge Cross Section	15°

■ Excellent Chip Control

Cutting Conditions	Chip	
vc = 60m/min fz = 0.12mm/t ap = 10mm ae = 21mm Wet (7MPa) Ramping Angle: 0°	Stable Chip Control WSE type	Unstable Chips Competitor's Product
vc = 50m/min fz = 0.12mm/t ap = 4mm ae = 50mm Wet (7MPa) Ramping Angle: 3°	Stable Chip Control WSE type	Unstable Chips Competitor's Product
vc = 50m/min fz = 0.12mm/t ap = 4mm ae = 50mm Wet (7MPa) Ramping Angle: 5.5°	Stable Chip Control WSE type	× Machining Not Possible Competitor's Product

Machine: 5-axis Machine HSK100, Work Material: Ti-6Al-4V
Tool: WSE 16050RS05L (ø50, 5-tooth)
Insert: XOMT160540PEER-E (ACS3000)

WSE 16000RS type

M Stainless Steel S Exotic Alloy

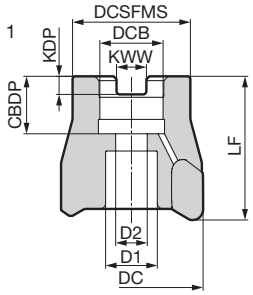
New

Rake Angle	Radial	-9° to -6°
	Axial	8° to 14°

15mm 90°

Shoulder Milling Groove Milling Ramping Helical Milling

Fig 1



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WSE 16050RS05**	●	**50**	41	40(38.5)	22	10.4	6.3	20	18	11	5	0.24	1
	16050RS05L	●	**50**	41	50(48.5)	22	10.4	6.3	20	18	11	5	0.33	1
	16063RS06	●	**63**	50	40(38.5)	22	10.4	6.3	20	18	11	6	0.46	1
	16063RS06L	●	**63**	50	50(48.5)	22	10.4	6.3	20	18	11	6	0.61	1

The LF dimensions in parentheses are dimensions using RE = 5.0 or larger insert. When using RE = 5.0 or larger inserts, the maximum depth of cut is 13mm.
Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold separately.

Identification Code

WSE	16	050	R	S	05	L
Series Code	Insert Size	Dia.	Feed Direction	Metric Bore	Number of Teeth	Long Body

Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure
		Handle Grip	Bit	Cream
BFTX0409IP	3.0	HPS1015	TRB15IP	SUMI-P

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

WSE 16000RS type

New

Insert

Dimensions (mm)

Grade Classification		Coated Carbide			
Process	High-speed/Light Cutting	M S			
	Medium Cutting	M S	M S		
	Roughing		M S		
Cat. No.		ACS2500	ACS3000	Corner Radius RE	Fig
XOMT 160508PEER-E		●	●	0.8	1
160512PEER-E		●	●	1.2	1
160516PEER-E		●	●	1.6	1
160520PEER-E		●	●	2	1
160530PEER-E		●	●	3	1
160540PEER-E		●	●	4	1
160550PEER-E		●	●	5	2
160560PEER-E		●	●	6	2
160564PEER-E		●	●	6.35	2

Fig1

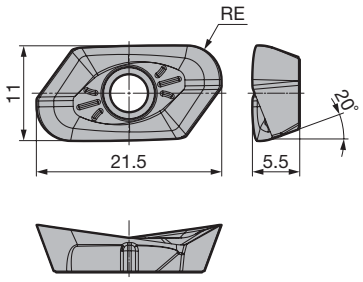
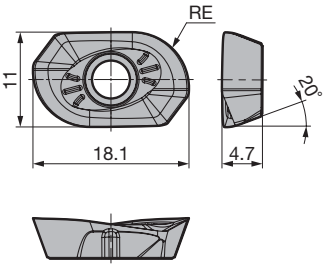
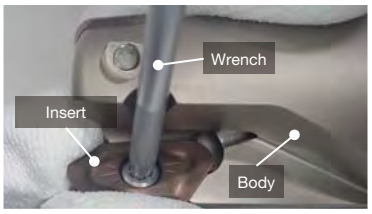


Fig2

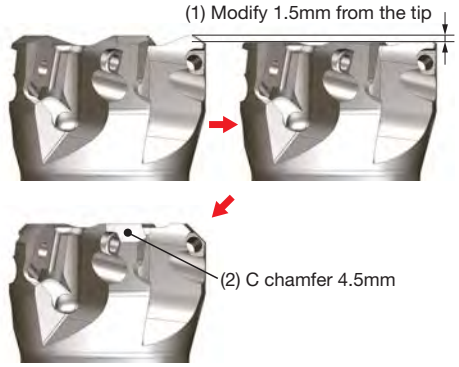


Precautions for Mounting Inserts

(1) Clean the mounting seat surface and contact parts.
(2) While pressing the insert firmly against the seat surface, tighten the screws with the included wrench.
(3) Apply Anti-seizure Cream to the screws and tighten at the recommended torque.
(4) After tightening, check that there are no gaps on the seat surface.



*Modification of the cutter body is required when using inserts with corner radius RE 5.0 or larger.



Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
S	Exotic Alloy	Heat-Resistant Alloy	—	E	25 - **35** - 50	0.05 - **0.10** - 0.15	ACS2500/ACS3000
		Ti Alloy	—	E	30 - **60** - 90	0.05 - **0.10** - 0.15	ACS2500/ACS3000
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200	E	115 - **145** - 175	0.05 - **0.10** - 0.15	ACS2500/ACS3000
		SUS403 and Others (Martensitic/Hardened)	240	E	105 - **130** - 155	0.05 - **0.10** - 0.15	ACS2500/ACS3000
		SUS304, SUS316 (Austenitic)	180	E	125 - **155** - 190	0.05 - **0.10** - 0.15	ACS2500/ACS3000

● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
● For groove milling, adjust the feed rate to around 70% of the above values.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WSE 16000E type

M Stainless Steel S Exotic Alloy

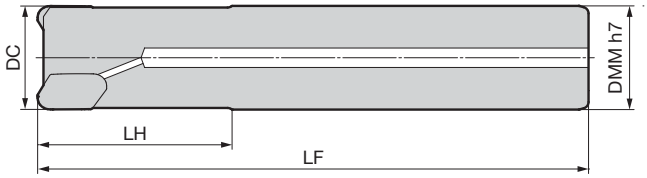
New

Rake Angle	Radial	-9°
	Axial	8°

15mm 90°

Shoulder Milling Groove Milling Ramping Helical Milling

Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WSE 16032E03	●	**32**	32	60(58.4)	170(168.4)	3	0.9	1

The LH and LF dimensions in parentheses are dimensions using RE = 5.0 or larger insert. When using RE = 5.0 or larger inserts, the maximum depth of cut is 13mm.
Inserts are sold separately.

Identification Code

WSE	16	032	E	03
Series Code	Insert Size	Dia.	Shank type	Number of Teeth

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0409IP	3.0	TRDR15IP	SUMI-P

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

WSE 16000E type

New

Insert

Dimensions (mm)

Grade Classification		Coated Carbide			
Process	High-speed/Light Cutting	M S			
	Medium Cutting	M S	M S		
	Roughing		M S		
Cat. No.		ACS2500	ACS3000	Corner Radius RE	Fig
XOMT 160508PEER-E		●	●	0.8	1
160512PEER-E		●	●	1.2	1
160516PEER-E		●	●	1.6	1
160520PEER-E		●	●	2	1
160530PEER-E		●	●	3	1
160540PEER-E		●	●	4	1
160550PEER-E		●	●	5	2
160560PEER-E		●	●	6	2
160564PEER-E		●	●	6.35	2

Fig1

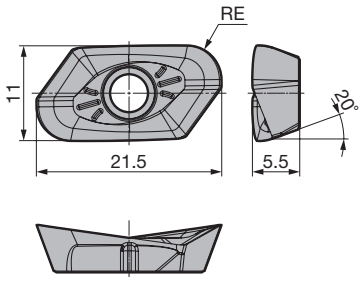
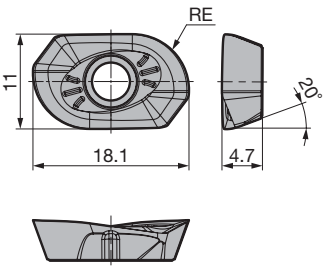
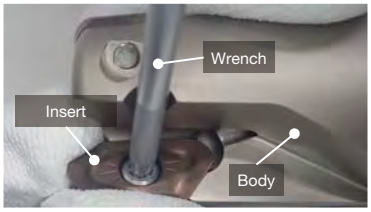


Fig2

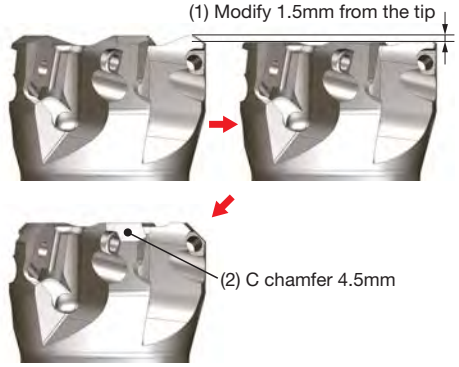


Precautions for Mounting Inserts

(1) Clean the mounting seat surface and contact parts.
(2) While pressing the insert firmly against the seat surface, tighten the screws with the included wrench.
(3) Apply Anti-seizure Cream to the screws and tighten at the recommended torque.
(4) After tightening, check that there are no gaps on the seat surface.



*Modification of the cutter body is required when using inserts with corner radius RE 5.0 or larger.



Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
S	Exotic Alloy	Heat-Resistant Alloy	—	E	25 - **35** - 50	0.05 - **0.10** - 0.15	ACS2500/ACS3000
		Ti Alloy	—	E	30 - **60** - 90	0.05 - **0.10** - 0.15	ACS2500/ACS3000
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200	E	115 - **145** - 175	0.05 - **0.10** - 0.15	ACS2500/ACS3000
		SUS403 and Others (Martensitic/Hardened)	240	E	105 - **130** - 155	0.05 - **0.10** - 0.15	ACS2500/ACS3000
		SUS304, SUS316 (Austenitic)	180	E	125 - **155** - 190	0.05 - **0.10** - 0.15	ACS2500/ACS3000

● The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
● For groove milling, adjust the feed rate to around 70% of the above values.

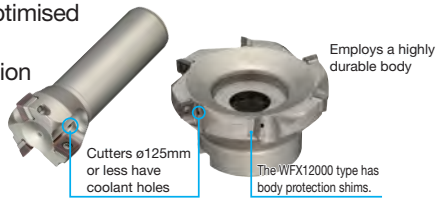
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

■ Features

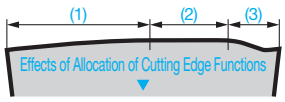
SEC-WaveMill WFX type for shoulder milling is a screw-lock type cutter capable of using four corners.
Ideal cutting edge design delivers good squareness.
Now with high-efficiency, multi-functional WFXH type and chamfering WFXC type, our comprehensive range covers a wide variety of applications.
In addition to the general-purpose grade ACU2500, applicable to various work materials, the new-generation coated carbide grades XCU2500/XCK2000 are now available.
Covering a wide variety of machining.

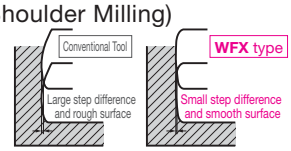
WFXH type WFXC type

The insert shape optimised for shoulder milling and the high-precision body leave a superior machined surface finish.



● Optimised Edge Shape (For Shoulder Milling)





(1): The convex shape ensures **cutting edge strength**
(2): The flat shape reduces step **differences in shoulder milling**
(3): The wiper edge function improves **the surface roughness**

■ Product Range

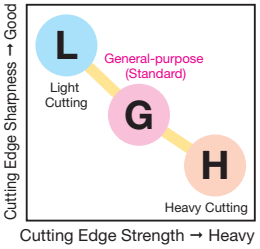
Applications	Type	Cat. No.	Description	Dia. (mm) ø8	ø16	ø20	ø22	ø25	ø28	ø30	ø32	ø33	ø40	ø50	ø63	ø80	ø100	ø125	ø160	ø200	ø250	Shape
Shoulder Milling	Shell	WFX 08000R (Inch)	Standard Pitch													6	8					
		WFX 08000RS	Standard Pitch										3	4	5	6	8					
		WFXM 08000R (Inch)	Fine Pitch													8	10					
		WFXM 08000RS	Fine Pitch										4	5	6	8	10					
		WFXF 08000R (Inch)	Extra Fine Pitch													10	12					
		WFXF 08000RS	Extra Fine Pitch										6	7	8	10	12					
		WFX 12000R (Inch)	Standard Pitch													4	5	6	8	10	12	
		WFX 12000RS	Standard Pitch											3	4	4	5					
		WFXF 12000R (Inch)	Extra Fine Pitch													6	7	8	12	16	18	
		WFXF 12000RS	Extra Fine Pitch											4	5	6	7					
	Shank	WFX 08000E	Standard Pitch			2*	2	2*	2	3	3	3	3	4	5							
		WFXM 08000E	Fine Pitch					3			4		4	5	6							
		WFX 12000E	Standard Pitch										3	3	4	4						
		WFXF 12000E	Extra Fine Pitch											4	5	6						
	Modular	WFX 08000M	Modular type			2	2	2	2	3	3		3									
High Efficiency	Shell	WFXH 08000RS	Standard Pitch										4	5 6	6							
		WFXH 12000RS	Standard Pitch											4	5							
	Modular	WFXH 08000M	Modular type					2			3											
		WFXH 12000M	Modular type										3									
Chamfering	Shank	WFXC 08000E	Standard Pitch	1	2																	
		WFXC 12000E	Standard Pitch					3			3											
	Modular	WFXC 08000M	Modular type		2																	
		WFXC 12000M	Modular type					3			3											

■ Chipbreaker Selection

Number in ●●● shows the number of teeth (Inch) Inch Bore *mark: Different diameter shanks in stock Modular type ☞H266

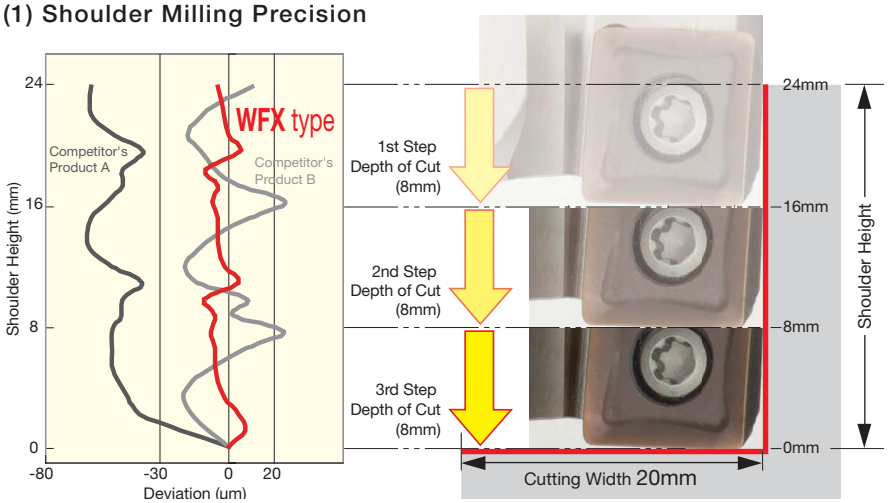
Work Material	P M K S				N
Applications	Light Cutting, Low Rigidity Milling and Reduction of Burrs	Main Chipbreaker General-purpose to Interrupted Milling	Roughing, Heavy Interrupted Cutting and Hardened Steel Milling	High-precision Finish	Non-Ferrous Metals
Features	Low Cutting Force	General-purpose type	High Strength type	Wiper	Sharp Edge
Chipbreaker	L type	G type	H type	Wiper Insert	S type
08 type Cross Section	0.05mm 20°	0.1mm 15°	0.15mm 10°	0.18mm 15°	25°
12 type Cross Section	0.05mm 25°	0.1mm 15°	0.2mm 15°	0.2mm 15°	27°

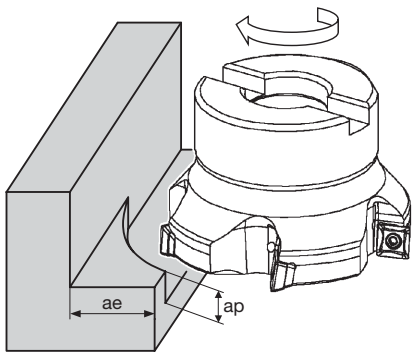
■ Chipbreaker Selection Guide



■ Cutting Performance

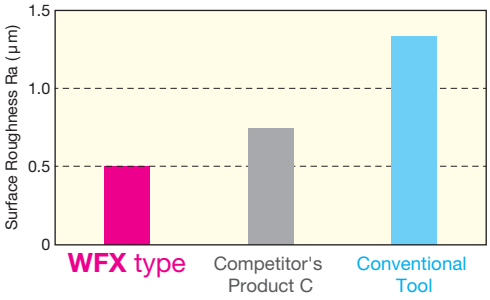
(1) Shoulder Milling Precision





Work Material : S50C Tool: WFX12100R (ø100 x 5 flutes)
Cutting Conditions : vc = 200m/min, fz = 0.15mm/t,
ap = 8.0mm×3 Passes, ae = 20mm

(2) Comparison of Surface Roughness



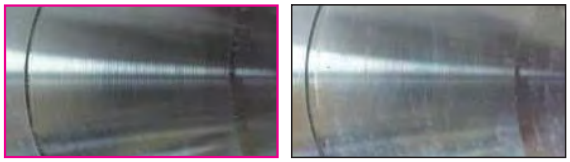
Work Material : SCM440 Tool: WFX12100R (ø100 x 5 teeth)
Cutting Conditions : vc = 200m/min, fz = 0.10mm/t,
ap = 3.0mm, ae = 90mm

(3) Comparison of Surface Properties

Work Material: S50C
Cutting Conditions : ap = 0.5mm

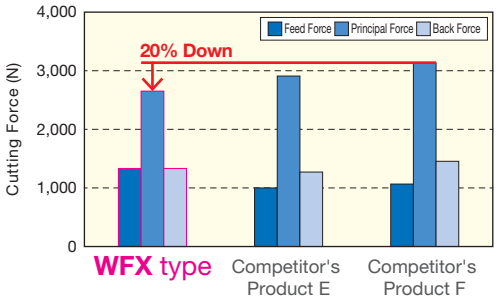
Glossy without Clouding　　Clouded without Gloss

Work Material: SUS304
Cutting Conditions : ap = 0.5mm



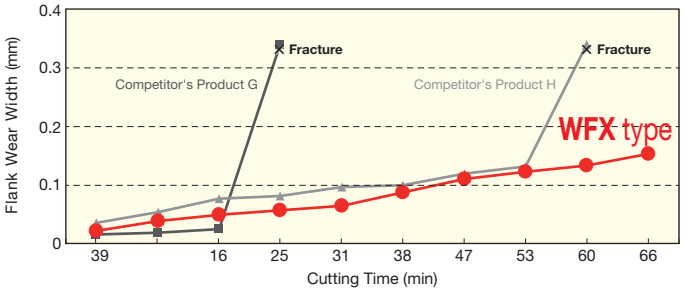
WFX type　　Competitor's Product D

(4) Comparison of Cutting Force



Work Material : S50C Tool: WFX12100R (ø100 x 5 teeth)
Cutting Conditions : vc = 200m/min, fz = 0.15mm/t,
ap = 10mm, ae = 20mm

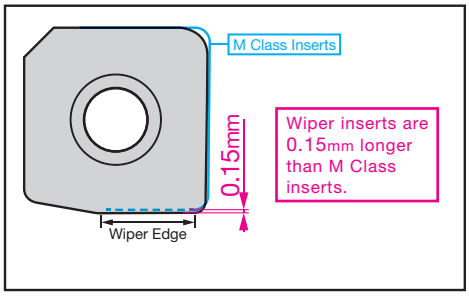
(5) Comparison of Wear Resistance

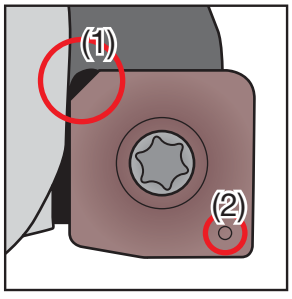


Work Material : SCM440 Tool: WFX12100R (ø100 x 1 tooth evaluation)
Cutting Conditions : vc = 200m/min, fz = 0.15mm/t,
ap = 5.0mm, ae = 30mm

■ Wiper Insert

Optimised wiper edge shape provides superior surface roughness.





Precautions when Using Wiper Inserts

- The wiper insert has a single corner specification.
- Attach the wiper insert so that the chamfered corner is in location (1) shown in the figure.
- Use the corner with the ID mark. (2)
  (08-size inserts have no marks.)
- Refer to page N17 for details about wiper inserts.

WFX 08000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-6°
	Axial	12°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling | Plunge Milling

Fig 1

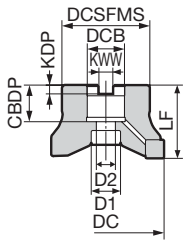


Fig 2

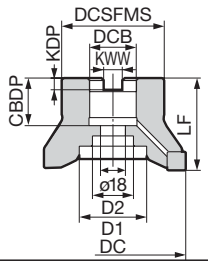
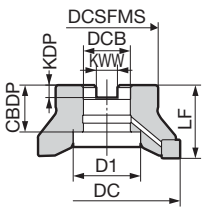


Fig 3



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WFX 08040RS**	●	**40**	33	40	**16**	8.4	5.6	18	14	9	3	0.2	1
	08050RS	●	**50**	41	40	**22**	10.4	6.3	20	18	11	4	0.3	1
	08063RS	●	**63**	50	40	**22**	10.4	6.3	20	18	11	5	0.6	1
	08080RS	●	*80	55	50	**27**	12.4	7	22	20	14	6	1.0	1
	08100RS	●	**100**	70	50	**32**	14.4	8	32	46	—	8	1.4	3
Inch	**WFX 08080R**	●	*80	55	50	**25.4**	9.5	6	25	20	14	6	1.0	1
	08100R	●	*100	70	63	**31.75**	12.7	8	32	46	27	8	1.9	2

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide									Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	P M S	P K M	P			K	K		M S		K N	N		
	Medium Cutting	P M S	P K M		P M	P M	K	K		M S	M S		N	P M	
	Roughing	P M S			P M	P M			K		M S			P	
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
XOEW 080308PZTR-W		●	—	—	—	—	—		●			—	—	●	—	2

Fig 1

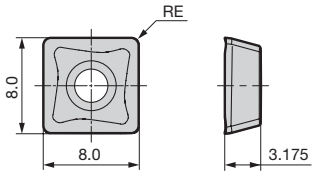
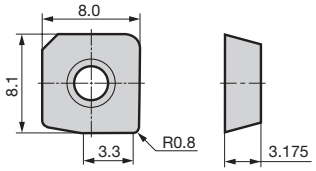


Fig 2 Wiper Insert



Refer to H109 (Precautions when Using Wiper Inserts) (Mounting Precautions).

Identification Code

WFX Series Code | **08** Insert Size | **040** Dia. | **R** Feed Direction | **S** Metric Bore

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
	N·m		
BFTX0306IP	2.0	TRDR08IP	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.08-**0.12**-0.18	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	< 6	
	Die Steel	200 to 220 HB	100-**150**-200	0.08-**0.12**-0.18	< 4	
M	Stainless Steel	—	160-**200**-250	0.10-**0.15**-0.20	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10-**0.15**-0.20	< 6	H1 DL1000
S	Exotic Alloy	—	30- **50** -80	0.08-**0.13**-0.18	< 6	ACU2500 ACM200 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

WFXM 08000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-6°
	Axial	12°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling | Plunge Milling

Fig 1

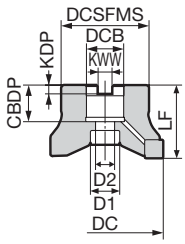


Fig 2

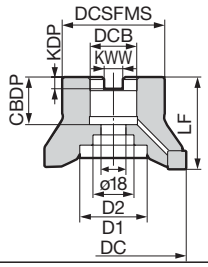
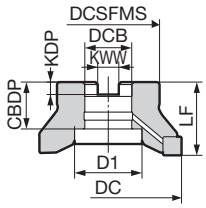


Fig 3



Body (Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WFXM 08040RS**	●	**40**	33	40	**16**	8.4	5.6	18	14	9	4	0.2	1
	08050RS	●	**50**	41	40	**22**	10.4	6.3	20	18	11	5	0.3	1
	08063RS	●	**63**	50	40	**22**	10.4	6.3	20	18	11	6	0.5	1
	08080RS	●	**80**	55	50	**27**	12.4	7	22	20	14	8	1.0	1
	08100RS	●	**100**	70	50	**32**	14.4	8	32	46	—	10	1.4	3
Inch	**WFXM 08080R**	●	**80**	55	50	**25.4**	9.5	6	25	20	14	8	1.0	1
	08100R	●	**100**	70	63	**31.75**	12.7	8	32	46	27	10	1.9	2

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	P M S	P M	P			K	K		M S		K N	N			
	Medium Cutting	P M S	P M		P M	P M	K	K		M S	M S		N	P M		
	Roughing	P M S			P M	P M			K		M S			P		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
XOEW 080308PZTR-W		●	—	—	—	—	—		●			—	—	●	—	2

Fig 1

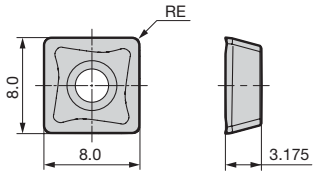
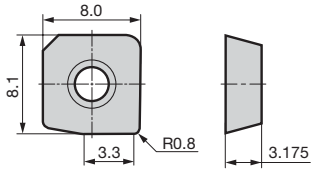


Fig 2 Wiper Insert



Refer to H109 (Precautions when Using Wiper Inserts) (Mounting Precautions).

Identification Code

WFX **M** **08** **040** **R** **S**

Series Code	Fine Pitch	Insert Size	Dia.	Feed Direction	Metric Bore
WFX	M	08	040	R	S

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0306IP	2.0	TRDR08IP	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.08-**0.12**-0.18	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	< 6	
	Die Steel	200 to 220 HB	100-**150**-200	0.08-**0.12**-0.18	< 4	
M	Stainless Steel	—	160-**200**-250	0.10-**0.15**-0.20	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10-**0.15**-0.20	< 6	H1 DL1000
S	Exotic Alloy	—	30- **50** -80	0.08-**0.13**-0.18	< 6	ACU2500 ACM200 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WFXF 08000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
Radial	-6°	
Axial	12°	

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling | Plunge Milling

Fig 1

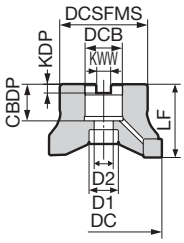


Fig 2

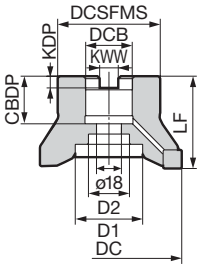
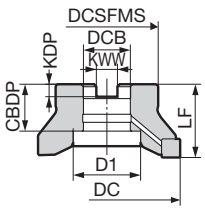


Fig 3



Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	WFXF 08040RS	●	40	33	40	16	8.4	5.6	18	14	9	6	0.2	1
	08050RS	●	50	41	40	22	10.4	6.3	20	18	11	7	0.3	1
	08063RS	●	63	50	40	22	10.4	6.3	20	18	11	8	0.5	1
	08080RS	●	*80	55	50	27	12.4	7	22	20	14	10	0.9	1
	08100RS	●	100	70	50	32	14.4	8	32	46	—	12	1.4	3
Inch	WFXF 08080R	●	*80	55	50	25.4	9.5	6	25	20	14	10	1.0	1
	08100R	●	*100	70	63	31.75	12.7	8	32	46	27	12	1.9	2

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	P M S	P K M	P			K	K		M S		K N	N			
	Medium Cutting	P M S	P K M		P M	P M	K	K		M S	M S		N	P M		
	Roughing	P M S			P M	P M			K		M S			P		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
XOEW 080308PZTR-W		●	—	—	—	—	—		●			—	—	●	—	2

Refer to H109 (Precautions when Using Wiper Inserts) (Mounting Precautions).

Fig 1

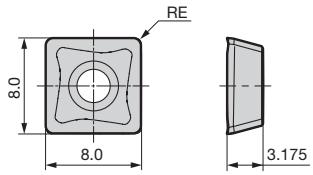
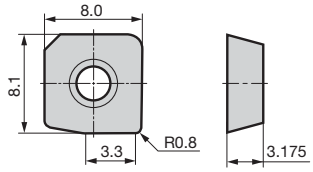


Fig 2 Wiper Insert



Identification Code

WFX Series Code | **F** Extra Fine Pitch | **08** Insert Size | **040** Dia. | **R** Feed Direction | **S** Metric Bore

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0306IP	2.0	TRDR08IP	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.08-**0.12**-0.18	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	< 6	
	Die Steel	200 to 220 HB	100-**150**-200	0.08-**0.12**-0.18	< 4	
M	Stainless Steel	—	160-**200**-250	0.10-**0.15**-0.20	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10-**0.15**-0.20	< 6	H1 DL1000
S	Exotic Alloy	—	30- **50** -80	0.08-**0.13**-0.18	< 6	ACU2500 ACM200 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

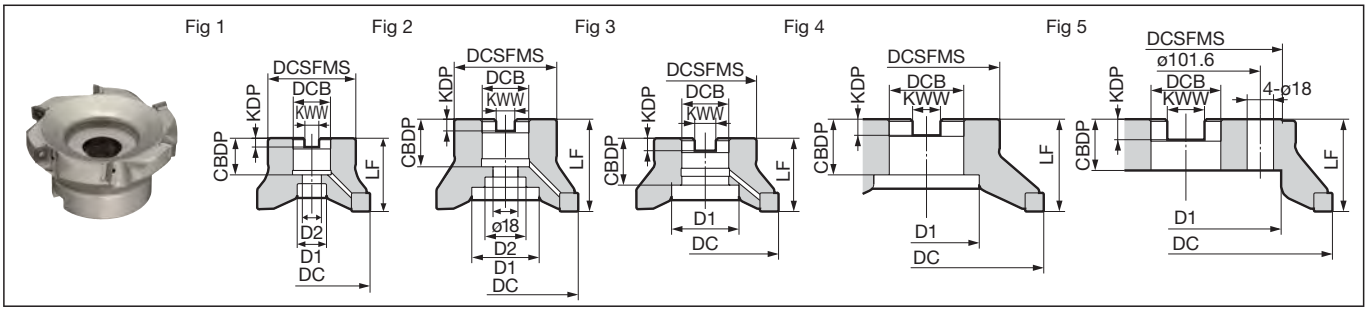
WFX 12000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-8°
	Axial	8°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling | Plunge Milling



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WFX 12050RS**	●	**50**	41	40	**22**	10.4	6.3	20	18	11	3	0.3	1
	12063RS	●	**63**	50	40	**22**	10.4	6.3	20	18	11	4	0.5	1
	12080RS	●	**80**	55	50	**27**	12.4	7	22	20	14	4	0.9	1
	12100RS	●	**100**	70	50	**32**	14.4	8	32	46	—	5	1.3	3
Inch	**WFX 12080R**	●	**80**	55	50	**25.4**	9.5	6	25	20	14	4	0.9	1
	12100R	●	**100**	70	63	**31.75**	12.7	8	32	46	27	5	1.7	2
	12125R	●	**125**	80	63	**38.1**	15.9	10	35.5	55	30	6	2.4	1
	12160R	●	**160**	100	63	**50.8**	19.1	11	38	72	—	8	3.6	4
	12200R	●	**200**	160	63	**47.625**	25.4	14	35	135	—	10	6.8	5
	12250R	●	**250**	180	63	**47.625**	25.4	14	35	160	—	12	9.6	5

Inserts are sold separately. Sizes ø160mm and above do not have coolant holes.

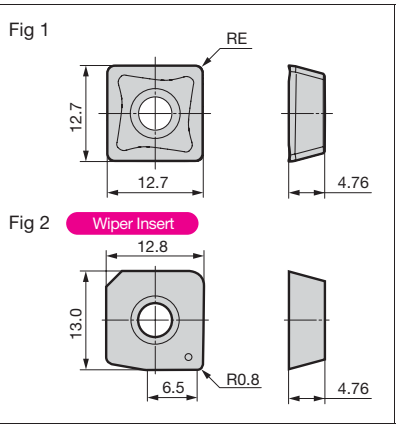
Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

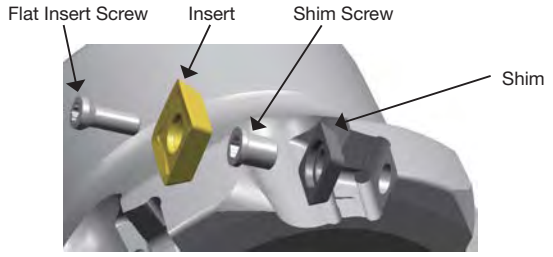
Insert

Dimensions (mm)

Grade Classification		Coated Carbide									Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	K M S	P M	P			K	K		M S	K N	N			
	Medium Cutting	K M S	P M		P M	P M	K	K		M S	M S	N		P M	
	Roughing	K M S			P M	P M			K		M S			P	
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 120408PDER-L		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOMT 120404PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
120408PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
120412PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.2	1
120416PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.6	1
SOMT 120408PDER-H		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOET 120408PDFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
XOEW 120408PDTR-W		●	—	—	—	—	—	—	●			—	—	●	—	2



Refer to H109 (Precautions when Using Wiper Inserts) (Mounting Precautions).



Identification Code

WFX **12** **050** **R** **S**

Series Code | Insert Size | Dia. | Feed Direction | Metric Bore

Parts

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw		Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
DC ø50 to 125	WFXS4R	BW0507F	LH035	BFTX03512IP	3.0	—	HPS1015	TRB15IP	SUMI-P
Other than above						TRDR15IP	—	—	

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	< 10	
	Die Steel	200 to 220 HB	100-**150**-200	0.10-**0.15**-0.20	< 6	
M	Stainless Steel	—	160-**200**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10-**0.15**-0.20	< 10	H1 DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.15**-0.20	< 10	ACU2500 ACM200 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

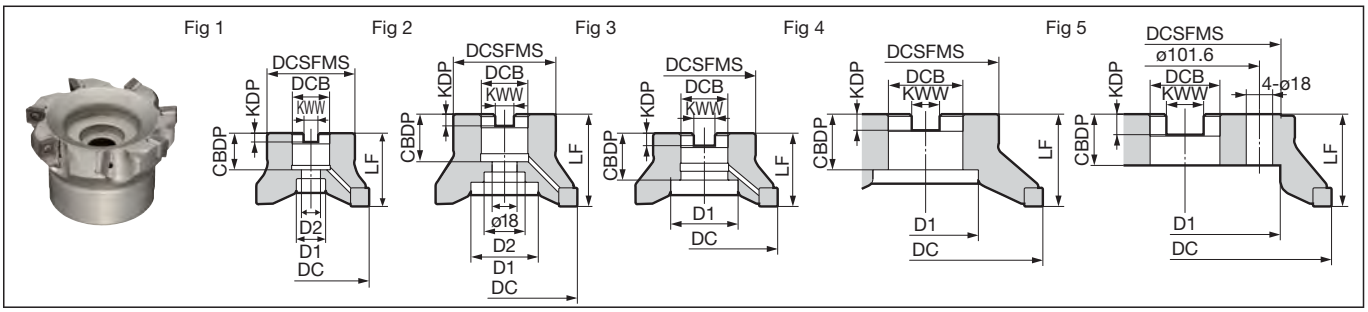
WFXF 12000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-8°
	Axial	8°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling | Plunge Milling



Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WFXF 12050RS**	●	**50**	41	40	**22**	10.4	6.3	20	18	11	4	0.3	1
	12063RS	●	**63**	50	40	**22**	10.4	6.3	20	18	11	5	0.5	1
	12080RS	●	**80**	55	50	**27**	12.4	7	22	20	14	6	0.9	1
	12100RS	●	**100**	70	50	**32**	14.4	8	32	46	—	7	1.3	3
Inch	**WFXF 12080R**	●	**80**	55	50	**25.4**	9.5	6	25	20	14	6	0.9	1
	12100R	●	**100**	70	63	**31.75**	12.7	8	32	46	27	7	1.7	2
	12125R	●	**125**	80	63	**38.1**	15.9	10	35.5	55	30	8	2.3	1
	12160R	●	**160**	100	63	**50.8**	19.1	11	38	72	—	12	3.5	4
	12200R	●	**200**	160	63	**47.625**	25.4	14	35	135	—	16	6.7	5
	12250R		**250**	180	63	**47.625**	25.4	14	35	160	—	18	9.5	5

Inserts are sold separately. Sizes ø160mm and above do not have coolant holes.

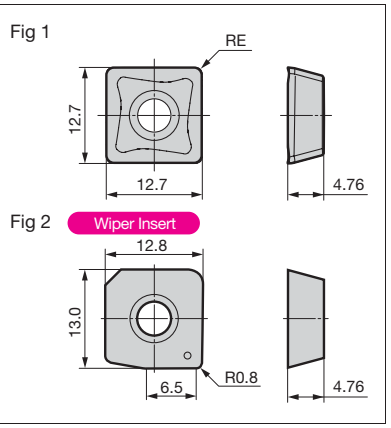
Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

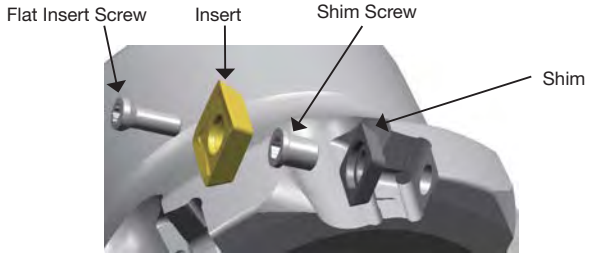
Insert

Dimensions (mm)

Grade Classification		Coated Carbide									Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	P K M S	P K M S	P			K	K		M S	K N	N			
	Medium Cutting	P K M S	P K M S		P M	P M	K	K		M S	M S	N	P M		
	Roughing	P K M S			P M	P M			K		M S		P		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 120408PDER-L		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOMT 120404PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
120408PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
120412PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.2	1
120416PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.6	1
SOMT 120408PDER-H		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOET 120408PDFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
XOEW 120408PDTR-W		●	—	—	—	—	—	—	●			—	—	●	—	2



Refer to H109 (Precautions when Using Wiper Inserts) (Mounting Precautions).



Identification Code

WFX **F** **12** **050** **R** **S**

Series Code	Extra Fine Pitch	Insert Size	Dia.	Feed Direction	Metric Bore

Parts

Applicable Cutter	Shim	Shim Screw	Wrench	Flat Insert Screw	N·m	Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
DC ø50 to 125	WFXS4R	BW0507F	LH035	BFTX03512IP	3.0	—	HPS1015	TRB15IP	SUMI-P
Other than above						TRDR15IP	—	—	

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	< 10	
	Die Steel	200 to 220 HB	100-**150**-200	0.10-**0.15**-0.20	< 6	
M	Stainless Steel	—	160-**200**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10-**0.15**-0.20	< 10	H1 DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.15**-0.20	< 10	ACU2500 ACM200 ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

SEC-WaveMill

WFX 08000E type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-6°
	Axial	12°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling | Plunge Milling

Fig 1

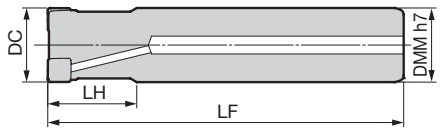
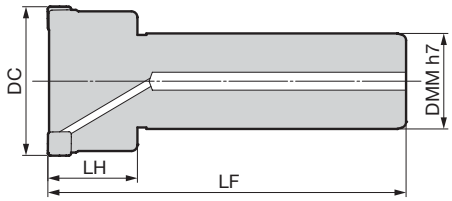


Fig 2



Body (Standard Pitch)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
WFX 08020E-16	●	**20**	16	30	110	2	1
08020E	●	**20**	20	30	110	2	1
08022E	●	**22**	20	30	120	2	1
08025E-20	●	**25**	20	30	120	2	1
08025E	●	**25**	25	30	120	2	1
08028E	●	**28**	25	30	120	2	1
08030E	●	**30**	25	30	120	3	1
08032E	●	**32**	32	30	120	3	1
08033E	●	**33**	32	30	120	3	1
08040E	●	**40**	32	30	120	3	2
08050E	●	**50**	32	30	120	4	2
08063E	●	**63**	32	30	120	5	2

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Body (Fine Pitch)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
WFXM 08025E	●	**25**	25	30	120	3	1
08032E	●	**32**	32	30	120	4	1
08040E	●	**40**	32	30	120	4	2
08050E	●	**50**	32	30	120	5	2
08063E	●	**63**	32	30	120	6	2

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide									Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	K M S	P M	P			K	K		M S	K N	N			
	Medium Cutting	K M S	P M		P M	P M	K	K		M S	M S		N	P M	
	Roughing	K M S			P M	P M			K		M S			P	
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
XOEW 080308PZTR-W		●	—	—	—	—	—		●			—	—	●	—	2

Fig 1

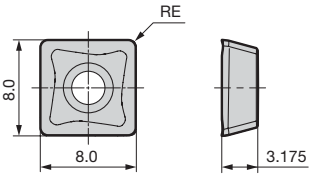
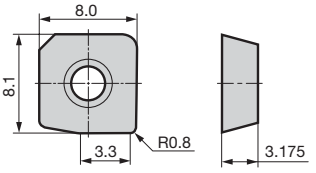


Fig 2 Wiper Insert



Refer to H109 (Precautions when Using Wiper Inserts) (Mounting Precautions).

Identification Code

WFX **M** **08** **025** **E**

WFX	M	08	025	E
Series Code	Fine Pitch	Insert Size	Dia.	Shank type

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0306IP	2.0	TRDR08IP	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.08-**0.12**-0.18	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	< 6	
	Die Steel	200 to 220 HB	100-**150**-200	0.08-**0.12**-0.18	< 4	
M	Stainless Steel	—	160-**200**-250	0.10-**0.15**-0.20	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10-**0.15**-0.20	< 6	H1 DL1000
S	Exotic Alloy	—	30- **50** -80	0.08-**0.13**-0.18	< 6	ACU2500 ACM200 ACM300

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

WFX(F) 12000E type

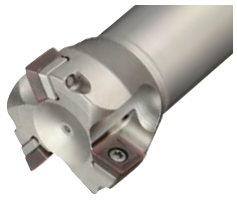
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

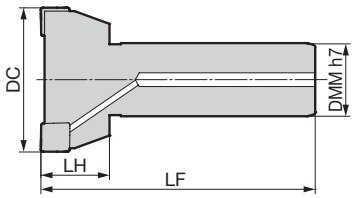
Rake Angle		
Rake	Radial	-8°
Angle	Axial	8°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling | Plunge Milling

Fig 1





Body (Standard Pitch)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WFX 12040E	●	**40**	32	30	120	3	0.68	1
12050E	●	**50**	32	30	120	3	0.78	1
12063E	●	**63**	32	30	120	4	0.94	1
12080E	●	**80**	32	30	120	4	1.29	1

Inserts are sold separately. ø40mm size does not have shims.

Body (Extra Fine Pitch)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WFXF 12050E	●	**50**	32	30	120	4	0.78	1
12063E	●	**63**	32	30	120	5	0.96	1
12080E	●	**80**	32	30	120	6	1.22	1

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	●	●	●			●	●		●		●	●			
	Medium Cutting	●	●		●	●	●	●		●	●		●	●		
	Roughing	●			●	●			●		●			●		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 120408PDER-L		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOMT 120404PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
120408PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
120412PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.2	1
120416PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.6	1
SOMT 120408PDER-H		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOET 120408PDFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
XOEW 120408PDTR-W		●	—	—	—	—	—	—	●			—	—	●	—	2

Refer to H109 (Precautions when Using Wiper Inserts) (Mounting Precautions).

Fig 1

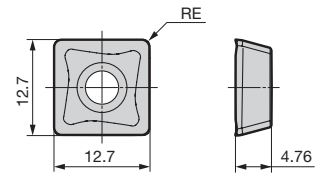
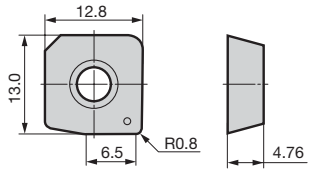
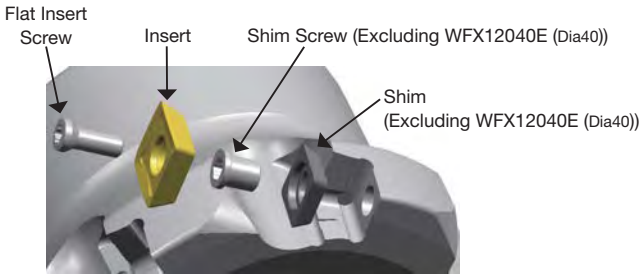


Fig 2 Wiper Insert





Identification Code

WFX **F** **12** **050** **E**

Series Code	Extra Fine Pitch	Insert Size	Dia.	Shank type

Parts

Shim	Shim Screw	Wrench	Flat Insert Screw		Wrench	Anti-seizure Cream
				N·m		
WFXS4R	BW0507F	LH035	BFTX03512IP	**3.0**	TRDR15IP	SUMI-P

ø40mm size does not have shims.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150-**200**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	< 10	
	Die Steel	200 to 220 HB	100-**150**-200	0.10-**0.15**-0.20	< 6	
M	Stainless Steel	—	160-**200**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	< 10	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10-**0.15**-0.20	< 10	H1 DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.15**-0.20	< 10	ACU2500 ACM200 ACM300

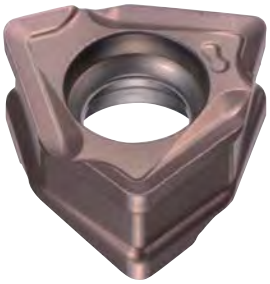
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

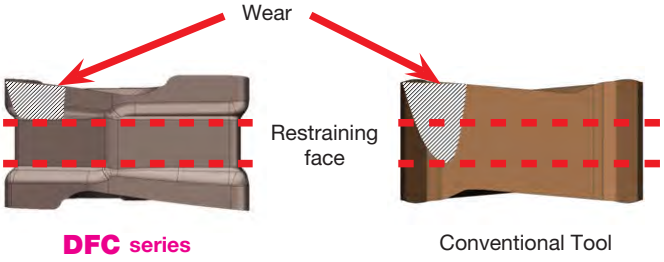
VIDEO OF CUTTING

Features

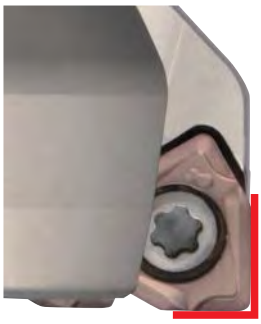
- The high-efficiency general-purpose/shoulder milling SEC-Sumi Dual Mill DFC series cutter has a unique insert shape with both excellent sharpness and cutting edge strength, enabling it to be used for a wider range of applications from high-efficiency machining through to finishing.
  Further expansion of the shoulder milling GS type chipbreaker, suitable for a wide range of applications.
- Applicable to various work materials
  In addition to the general-purpose grade ACU2500, the new-generation coated carbide grades XCU2500/XCK2000 are now available.
  Applicable to various work materials such as steel, stainless steel, cast iron, exotic alloys, and more.



Unique insert shape provides both sharpness and cutting edge strength



Flank wear of inserts for DFC series does not reach the restraining face and thus mounting accuracy does not suffer

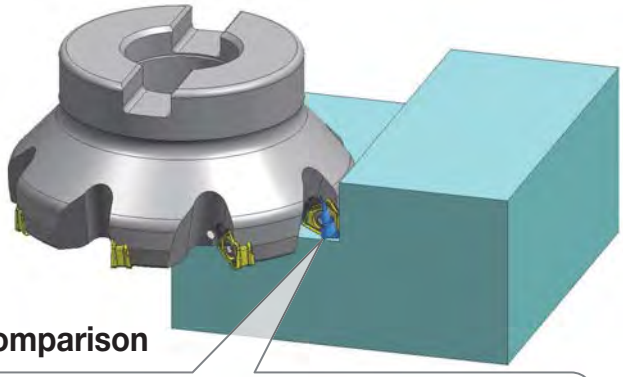


The 90° cutting angle is suitable for both face milling and shoulder milling

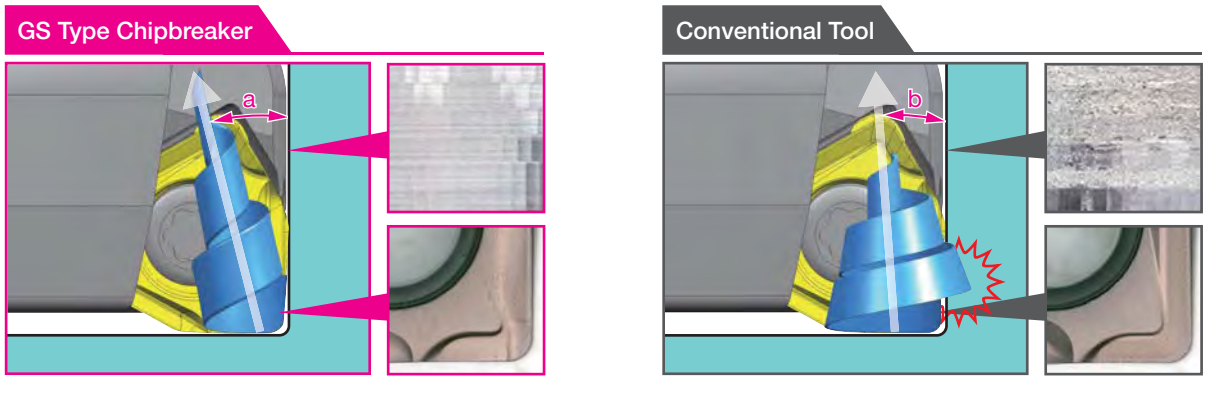
GS type Chipbreaker for Shoulder Milling

· Excellent chip control
· Suppresses machined surface deterioration due to chip biting

Work Material: S50C Tool: ø100mm
Cutting Conditions: vc = 200m/min, fz = 0.2mm/t, ae = 50mm, ap = 3mm x 6 Passes, Dry



Chip generation image and machined surface comparison

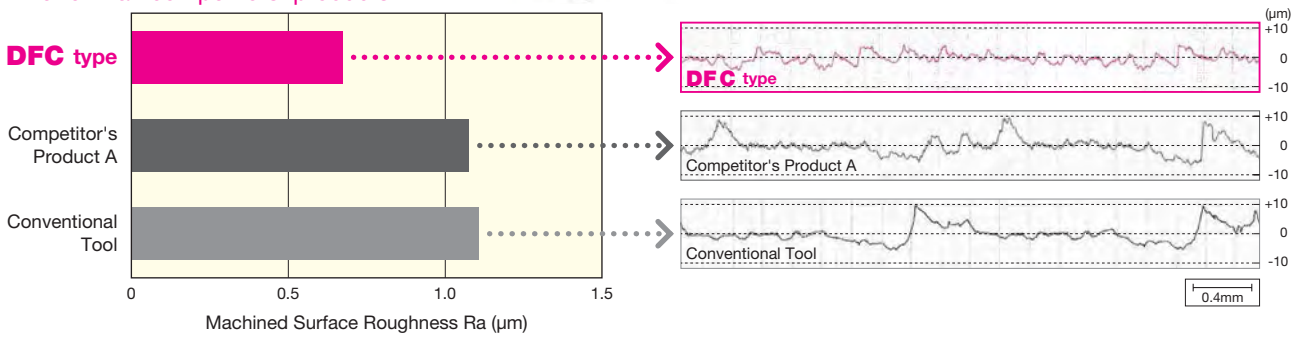


Chip flow direction control (a > b) ⇒ chip biting suppressed

■ Cutting Performance

Face Milling

(1) Machined surface roughness:
Better than competitors' products

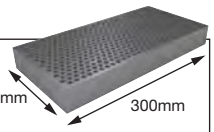


Work Material: S50C Tool: DFC 09100RS Insert: XNMU 060608PNER-G Grade: ACP200 Cutting Conditions: vc = 200m/min, fz = 0.2mm/t, ap = 3mm, ae = 85mm, Dry

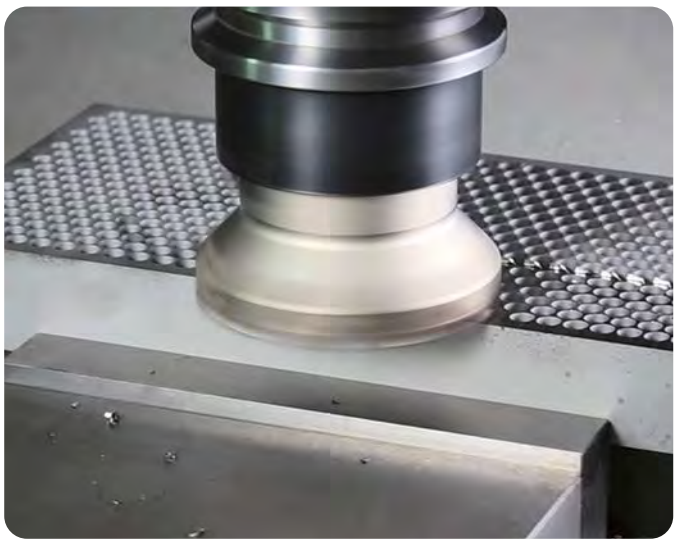
(2) Cutting edge strength/Cutting edge damage during heavy interrupted cutting:
Cutting edge strength surpasses competitors' double-sided cutters

	fz(mm/t)		
	0.3	0.4	0.5
DFC type	○	○	○
Competitor's Product B (Double-sided, 6 Corners)	○	Damage (Midway through 2 passes)	
Competitor's Product C (Double-sided, 6 Corners)	Damage (Midway through 3 passes)		
Competitor's Product D (Double-sided tangential)	Damage (Midway through 3 passes)		

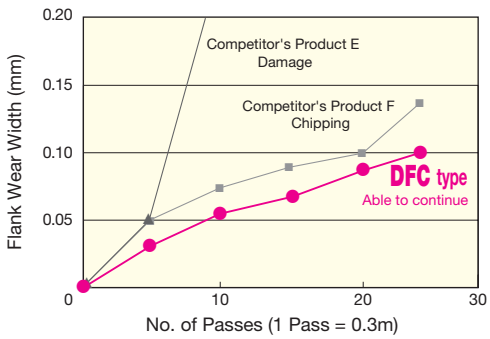
(Cutting Distance: 0.9m)



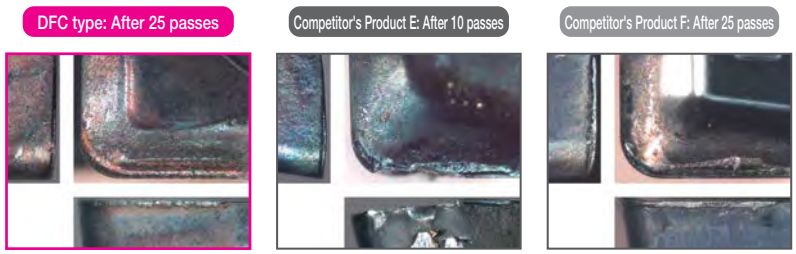
Work Material: S50C (With Holes)
Tool: DFC 09100RS
Insert: XNMU 060608PNER-G Grade: ACP300
Cutting Conditions: vc = 150m/min, ap = 3mm, ae = 50mm, Dry



(3) Wear resistance: Achieves long tool life thanks to excellent wear resistance



Comparison of cutting edge damage



Small wear/Able to continue | Fracture | Large wear

Work Material: S50C Tool: DFC 09100RS Insert: XNMU 060608PNER-G Grade: ACP200 Cutting Conditions: vc = 200m/min, fz = 0.2mm/t, ap = 3mm, ae = 85mm, Dry

■ Applications and Recommended Chipbreakers

Face Milling	Shoulder Milling		Side Milling	Helical Milling	Ramping
G	GS		G/GS		

Guidelines for Shoulder Milling Conditions

Maximum Radial Depth of Cut
G type: ae ≤ 10% of cutter diameter
GS type: ae ≤ 50% of cutter diameter

Recommended Axial Depth of Cut
ap = 3mm

Recommended Feed Rate
fz ≤ 0.2mm/t
(for general steel)

⚠ Applications which are not applicable

■ Product Range

Type	Cat. No.	Description	Dia. (mm) ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø160	ø200	Shape
Shell	DFC 09000R (Inch)	Standard Pitch						5	6	7	8	10	
	DFC 09000RS	Standard Pitch				4	4	5	6	7	8	10	
	DFCM 09000R (Inch)	Fine Pitch						7	8	11	12	16	
	DFCM 09000RS	Fine Pitch				5	6	7	8	11	12	16	
	DFCF 09000R (Inch)	Extra Fine Pitch						9	11	14	16	20	
	DFCF 09000RS	Extra Fine Pitch				6	7	9	11	14	16	20	
Shank	DFC 09000E	Standard Pitch	2	2	3	3*	4*	5*					
	DFCM 09000E	Fine Pitch		3	4	5*	6*	7*					

Number in ●● shows the number of teeth (Inch) Inch Bore *mark: Different diameter shanks in stock

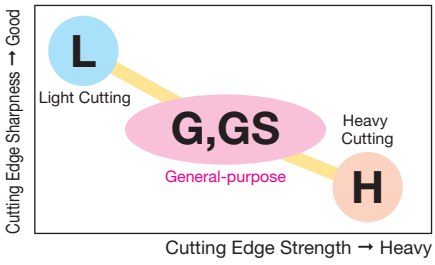
■ Insert Grades

The newly developed general-purpose ACU2500 grade suitable for various work materials has now been released.
Lineup of Steel Milling Grades ACP100/ACP200/ACP300, Stainless Steel Milling Grades ACM200/ACM300, Cast Iron Milling Grades ACK200/ACK300 and more to suit a wide range of work materials.

■ Chipbreaker Selection

Work Material	P Steel	M Stainless Steel	K Cast Iron	S Exotic Alloy
Applications	Light Cutting	General-purpose to Interrupted Milling	Shoulder Milling	Heavy Cutting
Features	Low Rigidity Milling, Reduction of Burrs	Face Milling	Shoulder Milling	Heavy Side Milling, Hardened Steel
Chipbreaker	L type	G type	GS type	H type
Cutting Edge Cross Section	30°	0.1mm 20°	0.1mm 20°	0.15mm 20°

■ Chipbreaker Selection Guide



■ Insert Mounting Precautions

Make sure there is no gap

No Gap

Gap

Place the insert face flat onto the cutter's insert pocket and tighten the flat insert screw with the recommended torque.

DFC 09000R(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle		
Rake	Radial	-9°
Angle	Axial	-5°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

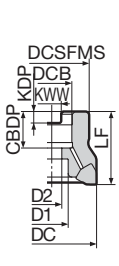


Fig 2

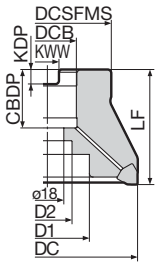


Fig 3

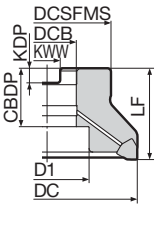


Fig 4

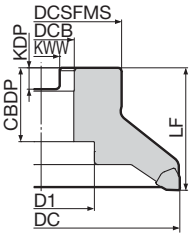


Fig 5

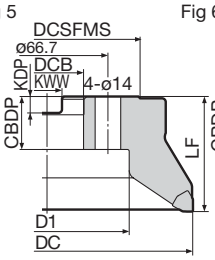
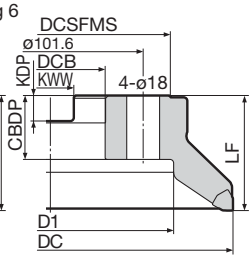


Fig 6



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**DFC 09050RS**	●	**50**	41	40	**22**	10.4	6.3	20	18	11	4	0.3	1
	09063RS	●	**63**	50	40	**22**	10.4	6.3	20	18	11	4	0.5	1
	09080RS	●	**80**	55	50	**27**	12.4	7	22	20	14	5	1.0	1
	09100RS	●	**100**	70	50	**32**	14.4	8	32	46	—	6	1.4	3
	09125RS	●	**125**	80	63	**40**	16.4	9	29	52	29	7	2.8	1
	09160RS	●	**160**	100	63	**40**	16.4	9	29	90	—	8	4.6	5
	09200RS	●	**200**	130	63	**60**	25.7	14	35	135	—	10	5.7	6
Inch	**DFC 09080R**	●	**80**	55	50	**25.4**	9.5	6	25	20	14	5	1.0	1
	09100R	●	**100**	70	63	**31.75**	12.7	8	32	46	27	6	2.0	2
	09125R	●	**125**	80	63	**38.1**	15.9	10	35.5	55	30	7	2.8	1
	09160R	●	**160**	100	63	**50.8**	19.1	11	38	72	—	8	3.6	4
	09200R	●	**200**	130	63	**47.625**	25.4	14	35	135	—	10	6.0	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

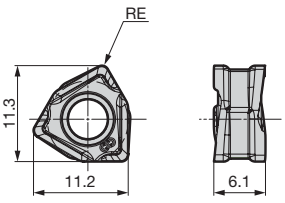
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting	P M K S	P M K S	P M			K	K		M S			
	Medium Cutting	P M K S	P M K S	P M	P M		K	K		M S	M S		
	Roughing	P M K S			P M	P M			K		M S		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	Corner Radius RE	Fig
XNMU 060604PNER-L		●	●	—	●	●	●	—	●	—	●	0.4	1
060608PNER-L		●	●	—	●	●	●	—	●	—	●	0.8	1
XNMU 060604PNER-G		●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-G		●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-G		●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-G		●	●	●	●	●	●	●	●	●	●	1.6	1
XNMU 060604PNER-GS		●	●	●	●	●	●			●	●	0.4	1
060608PNER-GS		●	●	●	●	●	●			●	●	0.8	1
060612PNER-GS		●	●	●	●	●	●			●	●	1.2	1
060616PNER-GS		●	●	●	●	●	●			●	●	1.6	1
XNMU 060608PNER-H		●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-H		●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-H		●	●	●	●	●	●	●	●	●	●	1.6	1

Fig 1



XNMU060608PNER-■

Identification Code

DFC Series Code | **09** Insert Size | **050** Cutter Dia. | **R** Feed Direction | **S** Metric Bore

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150 - **200** - 250	0.10 - **0.20** - 0.30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180 - **250** - 350	0.15 - **0.25** - 0.35	< 6	
	Die Steel	200 to 220 HB	100 - **150** - 200	0.10 - **0.18** - 0.25	< 4	
M	Stainless Steel	—	160 - **205** - 250	0.12 - **0.18** - 0.25	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100 - **175** - 250	0.10 - **0.20** - 0.30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **50** - 80	0.10 - **0.20** - 0.30	< 6	ACU2500 ACM200 ACM300

For shoulder milling, the GS type chipbreaker is recommended. Use at ae ≤ 50% of cutter diameter and fz ≤ 0.2mm/t.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seize Cream
				Handle Grip	Bit	
DC ø50 to 125	BFTX03512IP	N·m 3.0	—	HPS1015	TRB15IP	SUMI-P
Other than above			TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DFCM 09000R(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle		
	Radial	-9°
	Axial	-5°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

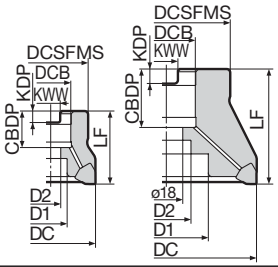


Fig 2

Fig 3

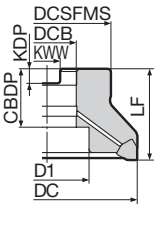


Fig 4

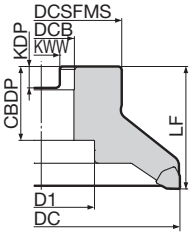


Fig 5

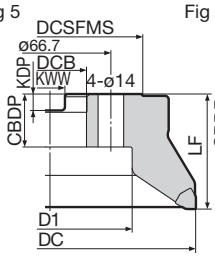
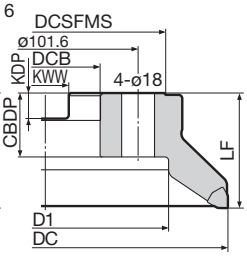


Fig 6



Body (Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**DFCM 09050RS**	●	**50**	41	40	**22**	10.4	6.3	20	18	11	5	0.3	1
	09063RS	●	**63**	50	40	**22**	10.4	6.3	20	18	11	6	0.5	1
	09080RS	●	**80**	55	50	**27**	12.4	7	22	20	14	7	0.9	1
	09100RS	●	**100**	70	50	**32**	14.4	8	32	46	—	8	1.4	3
	09125RS	●	**125**	80	63	**40**	16.4	9	29	52	29	11	2.7	1
	09160RS	●	**160**	100	63	**40**	16.4	9	29	90	—	12	4.5	5
	09200RS	●	**200**	130	63	**60**	25.7	14	35	135	—	16	5.6	6
Inch	**DFCM 09080R**	●	**80**	55	50	**25.4**	9.5	6	25	20	14	7	0.9	1
	09100R	●	**100**	70	63	**31.75**	12.7	8	32	46	27	8	1.9	2
	09125R	●	**125**	80	63	**38.1**	15.9	10	35.5	55	30	11	2.7	1
	09160R	●	**160**	100	63	**50.8**	19.1	11	38	72	—	12	3.5	4
	09200R	●	**200**	130	63	**47.625**	25.4	14	35	135	—	16	5.9	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

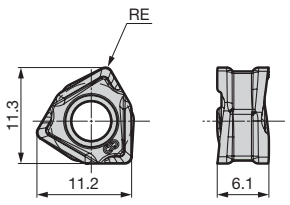
Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting	PS PM	PM PK	PM			K	K		MS			
	Medium Cutting	PS PM	PM PK	PM	PM		K	K		MS	MS		
	Roughing	PS PM			PM	PM			K		MS		

Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	Corner Radius RE	Fig
XNMU 060604PNER-L	●	●	—	●	●	●	—	●	—	●	0.4	1
060608PNER-L	●	●	—	●	●	●	—	●	—	●	0.8	1
XNMU 060604PNER-G	●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-G	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-G	●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-G	●	●	●	●	●	●	●	●	●	●	1.6	1
XNMU 060604PNER-GS	●	●	●	●	●	●			●	●	0.4	1
060608PNER-GS	●	●	●	●	●	●			●	●	0.8	1
060612PNER-GS	●	●	●	●	●	●			●	●	1.2	1
060616PNER-GS	●	●	●	●	●	●			●	●	1.6	1
XNMU 060608PNER-H	●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-H	●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-H	●	●	●	●	●	●	●	●	●	●	1.6	1

Fig 1



XNMU060608PNER-■

Identification Code

DFC Series Code | **M** Fine Pitch | **09** Insert Size | **050** Cutter Dia. | **R** Feed Direction | **S** Metric Bore

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150 - **200** - 250	0.10 - **0.20** - 0.30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180 - **250** - 350	0.15 - **0.25** - 0.35	< 6	
	Die Steel	200 to 220 HB	100 - **150** - 200	0.10 - **0.18** - 0.25	< 4	
M	Stainless Steel	—	160 - **205** - 250	0.12 - **0.18** - 0.25	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100 - **175** - 250	0.10 - **0.20** - 0.30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **50** - 80	0.10 - **0.20** - 0.30	< 6	ACU2500 ACM200 ACM300

For shoulder milling, the GS type breaker is recommended. Use at ae ≤ 50% of cutter diameter and fz ≤ 0.2mm/t.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seize Cream
				Handle Grip	Bit	
DC ø50 to 125	BFTX03512IP	N·m 3.0	—	HPS1015	TRB15IP	SUMI-P
Other than above			TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DFCF 09000R(S) type

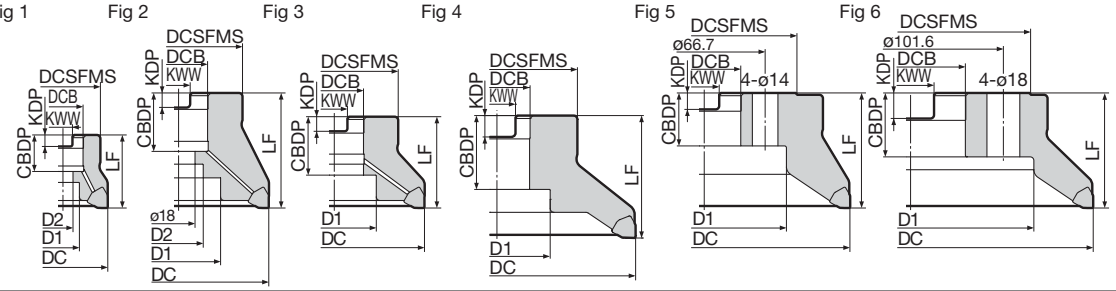
P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-9°
	Axial	-5°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1 Fig 2 Fig 3 Fig 4 Fig 5 Fig 6



Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	DFCF 09050RS	●	50	41	40	22	10.4	6.3	20	18	11	6	0.3	1
	09063RS	●	63	50	40	22	10.4	6.3	20	18	11	7	0.5	1
	09080RS	●	*80	55	50	27	12.4	7	22	20	14	9	0.9	1
	09100RS	●	*100	70	50	32	14.4	8	32	46	—	11	1.3	3
	09125RS	●	125	80	63	40	16.4	9	29	52	29	14	2.6	1
	09160RS	●	160	100	63	40	16.4	9	29	90	—	16	4.5	5
	09200RS	●	200	130	63	60	25.7	14	35	135	—	20	5.5	6
Inch	DFCF 09080R	●	*80	55	50	25.4	9.5	6	25	20	14	9	0.9	1
	09100R	●	*100	70	63	31.75	12.7	8	32	46	27	11	1.9	2
	09125R	●	125	80	63	38.1	15.9	10	35.5	55	30	14	2.7	1
	09160R	●	160	100	63	50.8	19.1	11	38	72	—	16	3.5	4
	09200R	●	200	130	63	47.625	25.4	14	35	135	—	20	5.8	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

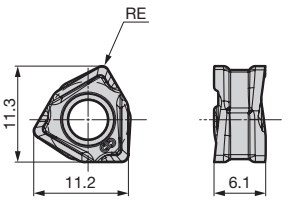
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting	PS PM	PM	PM			K	K		MS			
	Medium Cutting	PS PM	PM	PM	PM		K	K		MS	MS		
	Roughing	PS PM			PM	PM			K		MS		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	Corner Radius RE	Fig
XNMU 060604PNER-L		●	●	—	●	●	●	—	●	—	●	0.4	1
060608PNER-L		●	●	—	●	●	●	—	●	—	●	0.8	1
XNMU 060604PNER-G		●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-G		●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-G		●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-G		●	●	●	●	●	●	●	●	●	●	1.6	1
XNMU 060604PNER-GS		●	●	●	●	●	●			●	●	0.4	1
060608PNER-GS		●	●	●	●	●	●			●	●	0.8	1
060612PNER-GS		●	●	●	●	●	●			●	●	1.2	1
060616PNER-GS		●	●	●	●	●	●			●	●	1.6	1
XNMU 060608PNER-H		●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-H		●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-H		●	●	●	●	●	●	●	●	●	●	1.6	1

Fig 1



XNMU060608PNER-■

Identification Code

DFC	F	09	050	R	S
Series Code	Extra Fine Pitch	Insert Size	Cutter Dia.	Feed Direction	Metric Bore

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150 - **200** - 250	0.10 - **0.20** - 0.30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180 - **250** - 350	0.15 - **0.25** - 0.35	< 6	
	Die Steel	200 to 220 HB	100 - **150** - 200	0.10 - **0.18** - 0.25	< 4	
M	Stainless Steel	—	160 - **205** - 250	0.12 - **0.18** - 0.25	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100 - **175** - 250	0.10 - **0.20** - 0.30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **50** - 80	0.10 - **0.20** - 0.30	< 6	ACU2500 ACM200 ACM300

For shoulder milling, the GS type breaker is recommended. Use at ae ≤ 50% of cutter diameter and fz ≤ 0.2mm/t.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seizure Cream
				Handle Grip	Bit	
DC ø50 to 125	BFTX03512IP	N·m 3.0	—	HPS1015	TRB15IP	SUMI-P
Other than above			TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DFC(M) 09000E type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle		
	Radial	-9°
	Axial	-5°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

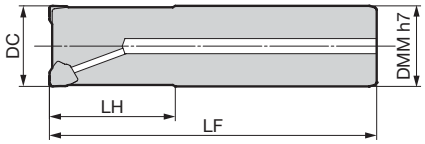
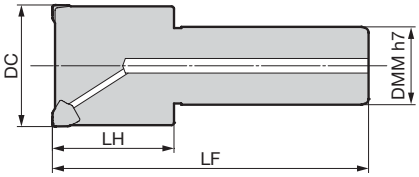


Fig 2



Body (Standard Pitch)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
DFC 09025E	●	**25**	25	40	120	2	1
09032E	●	**32**	32	50	130	2	1
09040E	●	**40**	32	50	130	3	2
09050E	●	**50**	32	50	130	3	2
09050E-42		**50**	42	50	150	3	2
09063E	●	**63**	32	50	130	4	2
09063E-42		**63**	42	50	150	4	2
09080E	●	**80**	32	50	130	5	2
09080E-42		**80**	42	50	150	5	2

Body (Fine Pitch)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Fig
DFCM 09032E	●	**32**	32	50	130	3	1
09040E	●	**40**	32	50	130	4	2
09050E	●	**50**	32	50	130	5	2
09050E-42		**50**	42	50	150	5	2
09063E	●	**63**	32	50	130	6	2
09063E-42		**63**	42	50	150	6	2
09080E	●	**80**	32	50	130	7	2
09080E-42		**80**	42	50	150	7	2

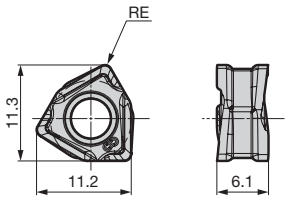
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting	P M S	P K M	P M			K	K		M S			
	Medium Cutting	P M S	P K M	P M	P M		K	K		M S	M S		
	Roughing	P M S			P M	P M			K		M S		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	Corner Radius RE	Fig
XNMU 060604PNER-L		●	●	—	●	●	●	—	●	—	●	0.4	1
060608PNER-L		●	●	—	●	●	●	—	●	—	●	0.8	1
XNMU 060604PNER-G		●	●	●	●	●	●	●	●	●	●	0.4	1
060608PNER-G		●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-G		●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-G		●	●	●	●	●	●	●	●	●	●	1.6	1
XNMU 060604PNER-GS		●	●	●	●	●	●			●	●	0.4	1
060608PNER-GS		●	●	●	●	●	●			●	●	0.8	1
060612PNER-GS		●	●	●	●	●	●			●	●	1.2	1
060616PNER-GS		●	●	●	●	●	●			●	●	1.6	1
XNMU 060608PNER-H		●	●	●	●	●	●	●	●	●	●	0.8	1
060612PNER-H		●	●	●	●	●	●	●	●	●	●	1.2	1
060616PNER-H		●	●	●	●	●	●	●	●	●	●	1.6	1

Fig 1



XNMU060608PNER-■

Identification Code

DFC **M** **09** **025** **E**

Series Code	Fine Pitch	Insert Size	Cutter Dia.	Shank type

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
	N·m		
BFTX03512IP	**3.0**	TRDR15IP	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Depth of Cut ap (mm)	Insert Grade
P	General Steel	180 to 280 HB	150 - **200** - 250	0.10 - **0.20** - 0.30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Mild Steel	≤ 180HB	180 - **250** - 350	0.15 - **0.25** - 0.35	< 6	
	Die Steel	200 to 220 HB	100 - **150** - 200	0.10 - **0.18** - 0.25	< 4	
M	Stainless Steel	—	160 - **205** - 250	0.12 - **0.18** - 0.25	< 6	ACU2500 ACM300
K	Cast Iron	250HB	100 - **175** - 250	0.10 - **0.20** - 0.30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **50** - 80	0.10 - **0.20** - 0.30	< 6	ACU2500 ACM200 ACM300

For shoulder milling, the GS type breaker is recommended. Use at ae ≤ 50% of cutter diameter and fz ≤ 0.2mm/t.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

TSX series

VIDEO OF CUTTING

■ Features

● **Excellent Machined Surface Quality**
Adopts ground type insert for high accuracy to realise excellent machined surface quality.

● **Cutting Edge Designed for High Cutting Edge Strength and Sharpness**
Adopts tangential insert and optimised cutting edge shape to achieve both high cutting edge strength and sharpness.

● **Wide Ranging Product Lineup**
An enhanced lineup of grades is available in addition to 2 types of insert sizes and 3 types of chipbreakers.
Can be used for a wide variety of machining applications.

● **Applicable to Various Work Materials**
In addition to the general-purpose grade ACU2500, the new-generation coated carbide grades XCU2500/XCK2000 are now available.
Applicable to various work materials such as steel, stainless steel, cast iron, and exotic alloys.

■ Product Range (Face Mills)

Type	Cat. No.	Description	Dia. (mm) ø16	ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø160	ø200	ø250	ø315	Shape
Shell	TSX 08000RS/LS	Standard Pitch					4	5	6	7							
Shell	TSX 08000R/L (Inch)	Standard Pitch								7							
Shell	TSXF 08000RS/LS	Extra Fine Pitch					6	8	10	11							
Shell	TSXF 08000R/L (Inch)	Extra Fine Pitch								11							
Shell	TSX 13000RS/LS	Standard Pitch					3	4	5	5	6	7	8	12	14	16	
Shell	TSX 13000R/L (Inch)	Standard Pitch								5	6	7	8	12	14	16	
Shell	TSXM 13000RS/LS	Fine Pitch					4	5	6	7	8	10	12	16	20	24	
Shell	TSXM 13000R/L (Inch)	Fine Pitch								7	8	10	12	16	20	24	
Shell	TSXF 13000RS/LS	Extra Fine Pitch					5	6	7	8	10	14	16				
Shell	TSXF 13000R/L (Inch)	Extra Fine Pitch								8	10	14	16				
Shank	TSX 08000E	Standard Pitch	2	2*	3*	3*	4	5	6	7							
Shank	TSXF 08000E	Extra Fine Pitch		3	4	5	6	8	10	11							
Shank	TSX 13000E	Standard Pitch			2	2	3	4	5	5							
Shank	TSXM 13000E	Fine Pitch				3	4	5	6	7							
Shank	TSXF 13000E	Extra Fine Pitch					5	6	7	8							

Number in ●● shows the number of teeth (Inch) Inch Bore *mark: Different diameter shanks in stock

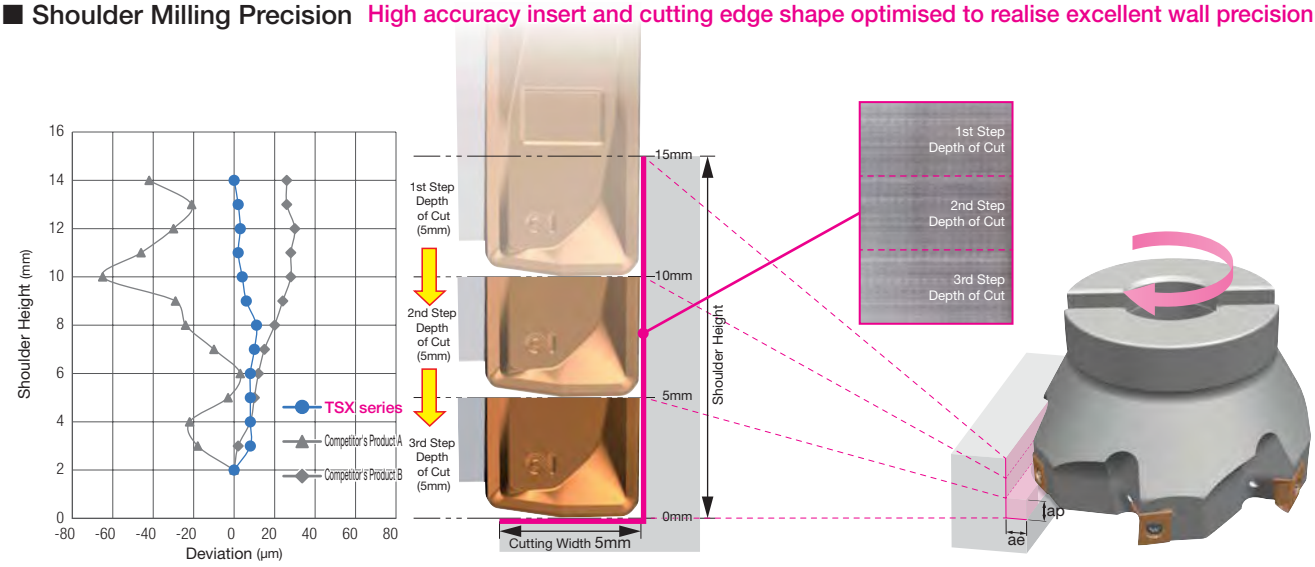
■ Product Range (Repeaters)

Type	Cat. No.	Dia. (mm) ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125	Shape
Shell	TSXR 08000RS			2	3	3 4	5				
Shell	TSXR 13000RS				2	3	3 4	4 5	5 6	7	
Shank	TSXR 08000E	1	2	2	3						
Shank	TSXR 13000E				2	3					

Number in ●● shows the number of teeth

■ Shoulder Milling Precision

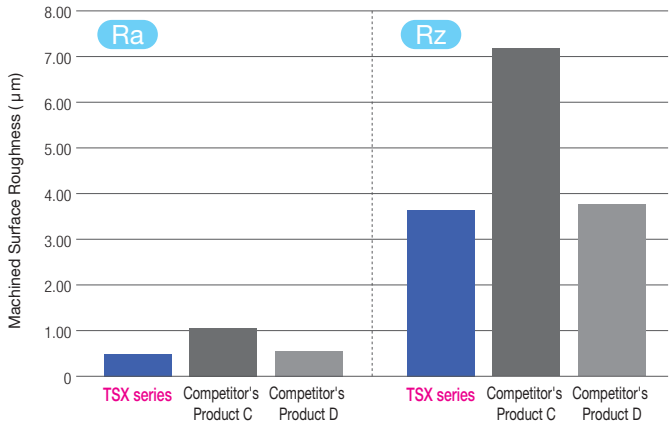
High accuracy insert and cutting edge shape optimised to realise excellent wall precision



Machine: Vertical Machining Centre BT50, Work Material: S50C
Tool: TSX 13100R, Insert: LNEX 130608PNER-G (ACP200)
Cutting Conditions: vc = 200m/min, fz = 0.2mm/t, ap = 5mm x 3 Passes, ae = 5mm, Dry

■ Machined Surface Roughness

Cutting edge shape optimised to realise excellent machined surface roughness



Machined Surface Comparison

TSX type Without Cloudiness

Competitor's Product Cloudy

Machine: Vertical Machining Centre BT50, Work Material: S50C
Tool: TSX 13100R, Insert: LNEX 130608PNER-G (ACP200)
Cutting Conditions: vc = 200m/min, fz = 0.2mm/t, ap = 3mm, ae = 60mm, Dry

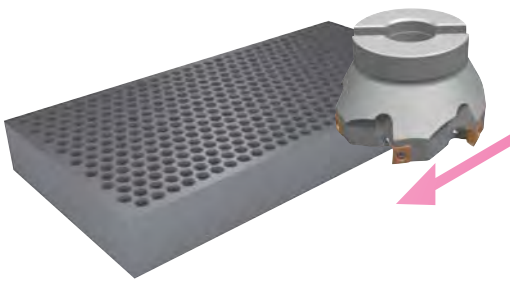
■ Cutting Edge Strength

TSX type has high cutting edge strength and enables high-efficiency machining

1 Pass = 300mm

Cutting Length	4 Passes	8 Passes	12 Passes
TSX series	Continued Machining Possible		
Competitor's Product E	Damage		
Competitor's Product F	Damage		

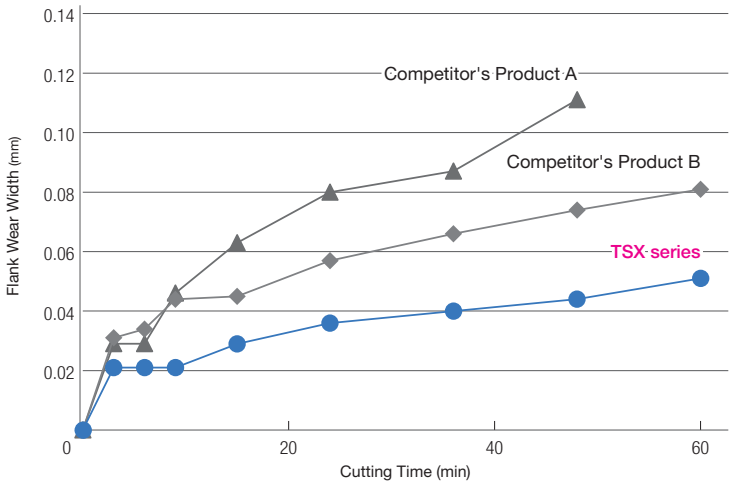
Machine: Vertical Machining Centre BT50, Work Material: S50C
Tool: TSX 13100R, Insert: LNEX 130608PNER-G (ACP200)
Cutting Conditions: vc = 150m/min, fz = 0.6mm/t (Accelerating),
ap = 3mm, ae = 40mm, Dry



TSX series

■ Tool Life

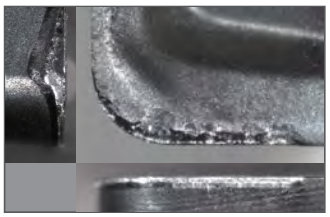
Excellent Wear Resistance Realises Stable Tool Life



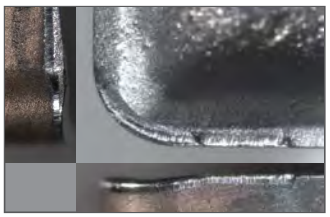
Machine:	Vertical Machining Centre BT50, Work Material: S50C
Tool:	TSX 08025E, Insert: LNEX 080408PNER-G (ACP200)
Cutting Conditions:	vc = 200m/min, fz = 0.1mm/t, ap = 2mm, ae = 5mm, Dry

TSX type
(After cutting for 60 minutes)

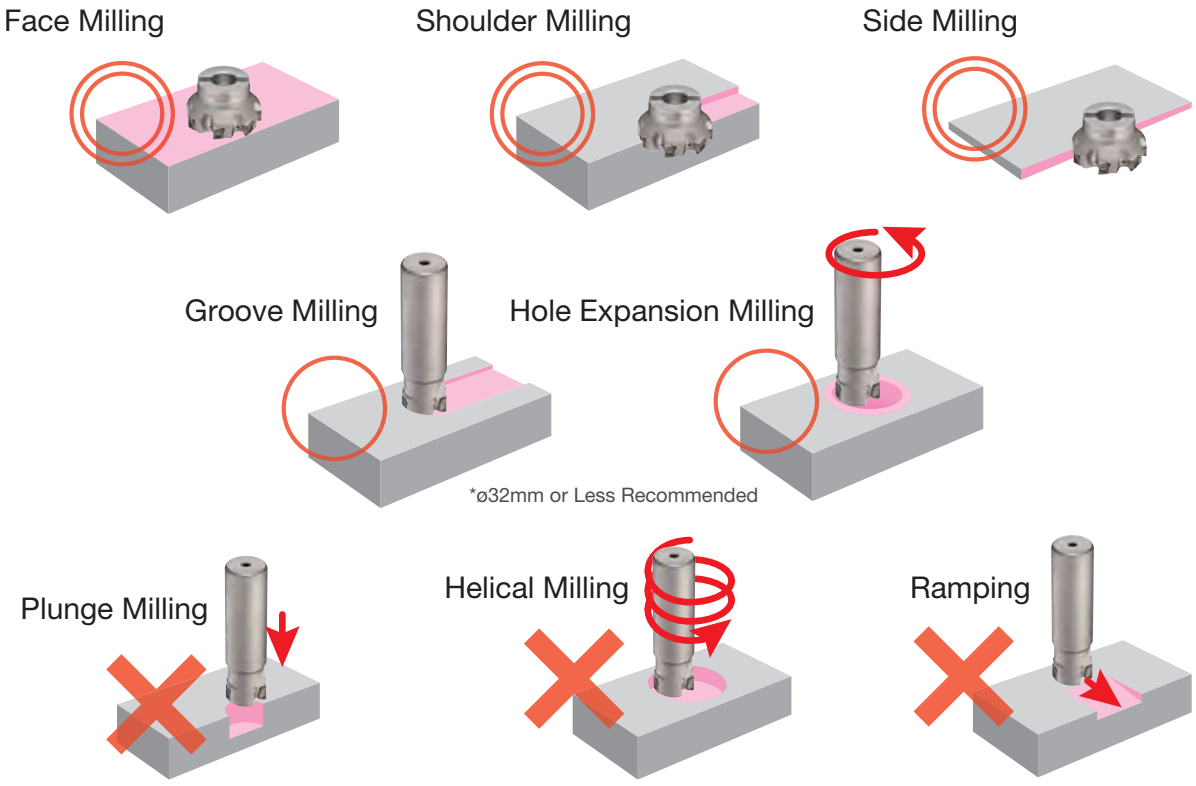
Competitor's Product A
(After cutting for 48 minutes)



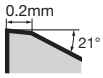
Competitor's Product B
(After cutting for 60 minutes)



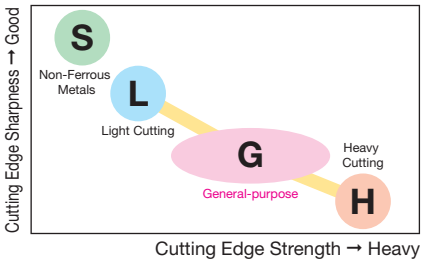
■ Applications



■ Chipbreaker Selection

Work Material	P M K S			N
Applications	Light Cutting, Low Rigidity Milling and Reduction of Burrs	General-purpose to Interrupted Milling	Heavy Cutting, Heavy Side Milling and Hardened Steel Milling	Non-Ferrous Metals
Features	Low Cutting Force	General-purpose type	High Strength type	High Rake type
Chipbreaker	**L type**	**G type**	**H type**	**S type**
LNEX08 type Cross Section			Not Available	
LNEX13 type Cross Section				

■ Chipbreaker Selection Guide



■ Product Range

Cat. No.	Corner Radius RE (mm)						
	0.4	0.8	1.2	1.6	2.0	2.4	3.2
LNEX 0804○○PNER/L-L	●	●	●	●	—	—	—
LNEX 0804○○PNER/L-G	●	●	●	●	—	—	—
LNEX 0804○○PNFR/L-S					—	—	—
LNEX 1306○○PNER/L-L	●	●	●	●	●	●	●
LNEX 1306○○PNER/L-G	●	●	●	●	●	●	●
LNEX 1306○○PNER-H	●	●	●	●	●	●	●
LNEX 1306○○PNFR/L-S							

TSX(F) 08000R/L(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-20°
	Axial	-6°

8mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

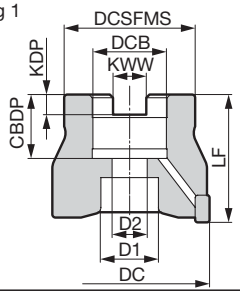


Figure shows right-handed (R) tool.

Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**TSX 08040RS/LS**	●		**40**	33	40	**16**	8.4	5.6	18	14	9	4	0.21	1
	08050RS/LS	●		**50**	41	40	**22**	10.4	6.3	20	18	11	5	0.30	1
	08063RS/LS	●		**63**	50	40	**22**	10.4	6.3	20	18	11	6	0.53	1
	08080RS/LS	●		***80**	55	50	**27**	12.4	7.0	22	20	14	7	0.99	1
Inch	**TSX 08080R/L**	●		***80**	55	50	**25.4**	9.5	6.0	25	20	14	7	1.00	1

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**TSXF 08040RS/LS**	●		**40**	33	40	**16**	8.4	5.6	18	14	9	6	0.21	1
	08050RS/LS	●		**50**	41	40	**22**	10.4	6.3	20	18	11	8	0.31	1
	08063RS/LS	●		**63**	50	40	**22**	10.4	6.3	20	18	11	10	0.54	1
	08080RS/LS	●		***80**	55	50	**27**	12.4	7.0	22	20	14	11	0.97	1
Inch	**TSXF 08080R/L**	●		***80**	55	50	**25.4**	9.5	6.0	25	20	14	11	0.98	1

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0308IP	**2.0**	TRDR08IP	SUMI-P

Identification Code

TSX **F** **08** **050** **R** **S**

Series Code	Extra Fine Pitch	Insert Size	Dia.	R: Right-Hand L: Left-Hand	Metric Bore

N·m Recommended Tightening Torque (N·m)

TSX(F) 08000R/L(S) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	KMS	PKM	PM			K	K		MS			N		
	Medium Cutting	KMS	PKM	PM	PM		K	K		MS	MS	N	N		
	Roughing	KMS			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 080404PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
080408PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
080412PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
080416PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
LNEX 080404PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
080408PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
080412PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
080416PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
LNEX 080402PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
080404PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
080408PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
080412PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
080416PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1
LNEX 080404PNEL-L					●				●			—	—	0.4	2
080408PNEL-L					●				●			—	—	0.8	2
080412PNEL-L					●				●			—	—	1.2	2
080416PNEL-L					●				●			—	—	1.6	2
LNEX 080404PNEL-G					●			●	●		●	—	—	0.4	2
080408PNEL-G					●			●	●		●	—	—	0.8	2
080412PNEL-G					●			●	●			—	—	1.2	2
080416PNEL-G					●			●	●			—	—	1.6	2
LNEX 080402PNFL-S		—	—	—	—	—	—	—	—	—	—			0.2	2
080404PNFL-S		—	—	—	—	—	—	—	—	—	—			0.4	2
080408PNFL-S		—	—	—	—	—	—	—	—	—	—			0.8	2
080412PNFL-S		—	—	—	—	—	—	—	—	—	—			1.2	2
080416PNFL-S		—	—	—	—	—	—	—	—	—	—			1.6	2

Fig 1 (Right-Hand)

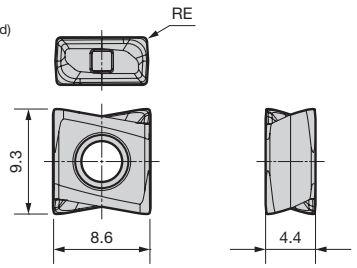
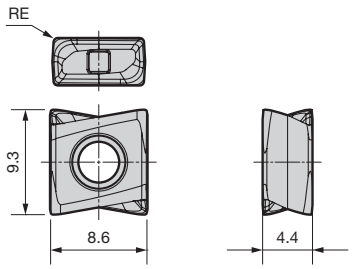


Fig 2 (Left-Hand)



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	150 - **225** - 300	0.08 - **0.20** - 0.30	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	75 - **150** - 230	0.08 - **0.20** - 0.30	
	Alloy Steel	180 to 280HB	100 - **175** - 250	0.08 - **0.15** - 0.25	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.08 - **0.15** - 0.25	ACU2500 ACM200 ACM300
		> 280HB	75 - **125** - 170	0.08 - **0.15** - 0.25	
K	Cast Iron/ Ductile Cast Iron	250HB	150 - **175** - 250	0.08 - **0.20** - 0.30	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.05 - **0.10** - 0.15	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT40 machine tools.

TSX 13000R/L(S) type

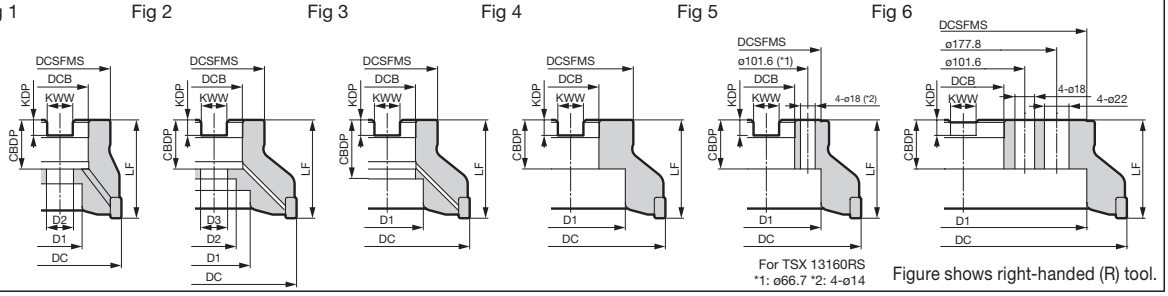
P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle		
	Radial	-23° to -15°
	Axial	-6°

12mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1 Fig 2 Fig 3 Fig 4 Fig 5 Fig 6



For TSX 13160RS *1: ø66.7 *2: 4-ø14

Figure shows right-handed (R) tool.

Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Number of Teeth	Weight (kg)	Fig
Metric	**TSX 13040RS/LS**	●		**40**	33	40	**16**	8.4	5.6	18.0	14	9	—	3	0.20	1
	13050RS/LS	●		**50**	41	40	**22**	10.4	6.3	20.0	18	11	—	4	0.30	1
	13063RS/LS	●		**63**	50	40	**22**	10.4	6.3	20.0	18	11	—	5	0.50	1
	13080RS/LS	●		***80**	55	50	**27**	12.4	7.0	22.0	20	14	—	5	0.92	1
	13100RS/LS	●		**100**	70	50	**32**	14.4	8.0	32.0	46	—	—	6	1.35	3
	13125RS/LS	●		**125**	80	63	**40**	16.4	9.0	29.0	52	29	—	7	2.55	1
	13160RS/LS	●		**160**	130	63	**40**	16.4	9.0	29.0	90	—	—	8	4.97	5*1*2
	13200RS/LS	●		**200**	160	63	**60**	25.7	14.0	35.0	135	—	—	12	6.20	5
	13250RS/LS	●		**250**	180	63	**60**	25.7	14.0	35.0	160	—	—	14	9.35	5
	13315RS/LS	●		**315**	240	63	**60**	25.7	14.0	35.0	230	—	—	16	16.42	6
Inch	**TSX 13080R/L**	●		***80**	55	50	**25.4**	9.5	6.0	25.0	20	14	—	5	0.93	1
	13100R/L	●		***100**	70	63	**31.75**	12.7	8.0	32.0	46	27	18	6	1.88	2
	13125R/L	●		**125**	80	63	**38.1**	15.9	10.0	35.5	55	30	—	7	2.61	1
	13160R/L	●		**160**	100	63	**50.8**	19.1	11.0	38.0	72	—	—	8	4.18	4
	13200R/L	●		**200**	160	63	**47.625**	25.4	14.0	35.0	135	—	—	12	6.36	5
	13250R/L	●		**250**	180	63	**47.625**	25.4	14.0	35.0	160	—	—	14	9.60	5
	13315R/L	●		**315**	240	63	**47.625**	25.4	14.0	35.0	230	—	—	16	16.68	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Identification Code

TSX 13 100 R S

TSX	13	100	R	S
Series Code	Insert Size	Dia.	R: Right-Hand L: Left-Hand	Metric Bore

Parts

Applicable Cutter	Shim	Flat Insert Screw	N·m	Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
TSX 13040RS/LS TSX 13050RS/LS TSX 13063RS/LS TSX 13080RS/LS TSX 13100RS/LS TSX 13125RS/LS TSX 13160RS/LS	—	BFTX03510IP	3.0	—	HPS1015	TRB15IP	SUMI-P
TSX 13200RS/LS TSX 13250RS/LS TSX 13315RS/LS	TSXS13R/L			TRDR15IP	—	—	
TSX 13080R/L TSX 13100R/L TSX 13125R/L TSX 13160R/L	—			—	HPS1015	TRB15IP	
TSX 13200R/L TSX 13250R/L TSX 13315R/L	TSXS13R/L			TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m)

TSX 13000R/L(S) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	KSM	PKM	PM			K	K		MS			N		
	Medium Cutting	KSM	PKM	PM	PM		K	K		MS	MS	N	N		
	Roughing	KSM			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 130604PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
130616PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
130620PNER-L		●	●		●		●		●	●	●	—	—	2.0	1
130624PNER-L		●	●		●		●		●	●	●	—	—	2.4	1
130632PNER-L		●	●		●		●		●	●	●	—	—	3.2	1
LNEX 130604PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
130616PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
130620PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.0	1
130624PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.4	1
130632PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	3.2	1
LNEX 130604PNER-H		●	●		●	●	●	●	●			—	—	0.4	1
130608PNER-H		●	●		●	●	●	●	●			—	—	0.8	1
130612PNER-H		●	●		●	●	●	●	●			—	—	1.2	1
130616PNER-H		●	●		●	●	●	●	●			—	—	1.6	1
130620PNER-H		●	●		●	●	●	●	●			—	—	2.0	1
130624PNER-H		●	●		●	●	●	●	●			—	—	2.4	1
130632PNER-H		●	●		●	●	●	●	●			—	—	3.2	1
LNEX 130602PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
130604PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
130608PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
130612PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
130616PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1
130620PNFR-S		—	—	—	—	—	—	—	—	—	—			2.0	1
130624PNFR-S		—	—	—	—	—	—	—	—	—	—			2.4	1
130632PNFR-S		—	—	—	—	—	—	—	—	—	—			3.2	1
LNEX 130604PNEL-L					●				●			—	—	0.4	2
130608PNEL-L					●				●			—	—	0.8	2
130612PNEL-L					●				●			—	—	1.2	2
130616PNEL-L					●				●			—	—	1.6	2
130620PNEL-L					●				●			—	—	2.0	2
130624PNEL-L					●				●			—	—	2.4	2
130632PNEL-L					●				●			—	—	3.2	2
LNEX 130604PNEL-G					●			●	●		●	—	—	0.4	2
130608PNEL-G					●			●	●		●	—	—	0.8	2
130612PNEL-G					●			●	●			—	—	1.2	2
130616PNEL-G					●			●	●			—	—	1.6	2
130620PNEL-G					●			●	●			—	—	2.0	2
130624PNEL-G					●			●	●			—	—	2.4	2
130632PNEL-G					●			●	●			—	—	3.2	2
LNEX 130602PNFL-S		—	—	—	—	—	—	—	—	—	—			0.2	2
130604PNFL-S		—	—	—	—	—	—	—	—	—	—			0.4	2
130608PNFL-S		—	—	—	—	—	—	—	—	—	—			0.8	2
130612PNFL-S		—	—	—	—	—	—	—	—	—	—			1.2	2
130616PNFL-S		—	—	—	—	—	—	—	—	—	—			1.6	2
130620PNFL-S		—	—	—	—	—	—	—	—	—	—			2.0	2
130624PNFL-S		—	—	—	—	—	—	—	—	—	—			2.4	2
130632PNFL-S		—	—	—	—	—	—	—	—	—	—			3.2	2

Fig 1 (Right-Hand)

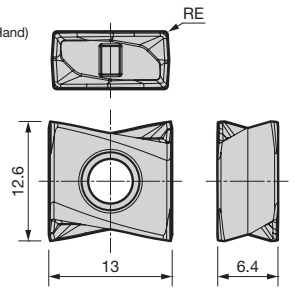
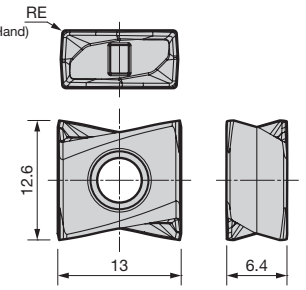


Fig 2 (Left-Hand)



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	150 - **225** - 300	0.10 - **0.30** - 0.40	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	75 - **150** - 230	0.10 - **0.30** - 0.40	
	Alloy Steel	180 to 280HB	100 - **175** - 250	0.10 - **0.25** - 0.35	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.10 - **0.20** - 0.30	ACU2500 ACM200 ACM300
		> 280HB	75 - **125** - 170	0.10 - **0.20** - 0.30	

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
K	Cast Iron/ Ductile Cast Iron	250HB	150 - **175** - 250	0.10 - **0.30** - 0.40	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.10 - **0.15** - 0.20	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT50 machine tools.

● mark: Standard stocked item (new product/expanded item)

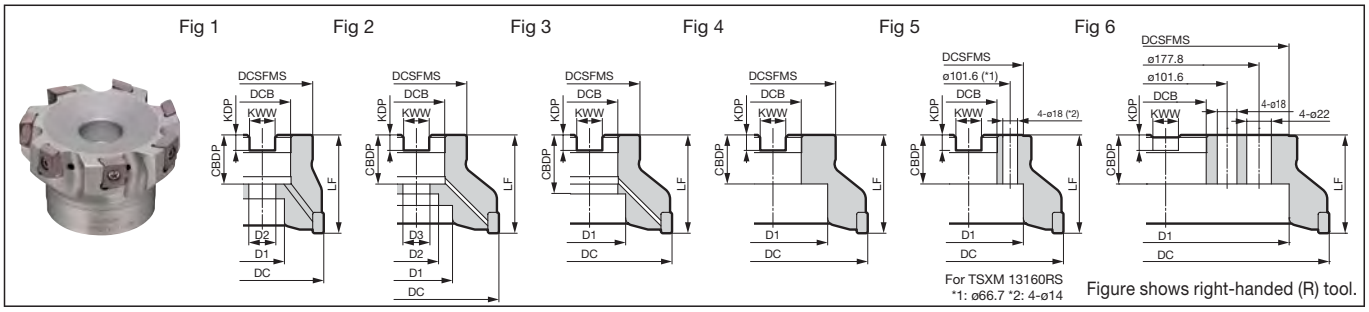
TSXM 13000R/L(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle		
	Radial	-23° to 15°
	Axial	-6°

12mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling



Body (Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Number of Teeth	Weight (kg)	Fig
Metric	**TSXM 13040RS/LS**	●		**40**	33	40	**16**	8.4	5.6	18.0	14	9	—	4	0.19	1
	13050RS/LS	●		**50**	41	40	**22**	10.4	6.3	20.0	18	11	—	5	0.28	1
	13063RS/LS	●		**63**	50	40	**22**	10.4	6.3	20.0	18	11	—	6	0.50	1
	13080RS/LS	●		***80**	55	50	**27**	12.4	7.0	22.0	20	14	—	7	0.92	1
	13100RS/LS	●		**100**	70	50	**32**	14.4	8.0	32.0	46	—	—	8	1.36	3
	13125RS/LS	●		**125**	80	63	**40**	16.4	9.0	29.0	52	29	—	10	2.57	1
	13160RS/LS	●		**160**	130	63	**40**	16.4	9.0	29.0	90	—	—	12	5.02	5
	13200RS/LS	●		**200**	160	63	**60**	25.7	14.0	35.0	135	—	—	16	6.32	5
	13250RS/LS	●		**250**	180	63	**60**	25.7	14.0	35.0	160	—	—	20	9.42	5
	13315RS/LS	●		**315**	240	63	**60**	25.7	14.0	35.0	230	—	—	24	16.37	6
Inch	**TSXM 13080R/L**	●		***80**	55	50	**25.4**	9.5	6.0	25.0	20	14	—	7	0.93	1
	13100R/L	●		***100**	70	63	**31.75**	12.7	8.0	32.0	46	27	18	8	1.90	2
	13125R/L	●		**125**	80	63	**38.1**	15.9	10.0	35.5	55	30	—	10	2.62	1
	13160R/L	●		**160**	100	63	**50.8**	19.1	11.0	38.0	72	—	—	12	4.22	4
	13200R/L	●		**200**	160	63	**47.625**	25.4	14.0	35.0	135	—	—	16	6.48	5
	13250R/L	●		**250**	180	63	**47.625**	25.4	14.0	35.0	160	—	—	20	9.68	5
	13315R/L	●		**315**	240	63	**47.625**	25.4	14.0	35.0	230	—	—	24	16.63	6

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Identification Code

TSX M 13 100 R S

TSX	M	13	100	R	S
Series Code	Fine Pitch	Insert Size	Dia.	R: Right-Hand L: Left-Hand	Metric Bore

Parts

Applicable Cutter	Shim	Flat Insert Screw	N·m	Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
TSXM 13040RS/LS TSXM 13050RS/LS TSXM 13063RS/LS TSXM 13080RS/LS TSXM 13100RS/LS TSXM 13125RS/LS TSXM 13160RS/LS	—	BFTX03510IP	3.0	—	HPS1015	TRB15IP	SUMI-P
TSXM 13200RS/LS TSXM 13250RS/LS TSXM 13315RS/LS	TSXS13R/L			TRDR15IP	—	—	
TSXM 13080R/L TSXM 13100R/L TSXM 13125R/L TSXM 13160R/L	—			—	HPS1015	TRB15IP	
TSXM 13200R/L TSXM 13250R/L TSXM 13315R/L	TSXS13R/L			TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m)

TSXM 13000R/L(S) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	PKM	PKM	PM			K	K		MS			N		
	Medium Cutting	PKM	PKM	PM	PM		K	K		MS	MS	N	N		
	Roughing	PKM			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 130604PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
130616PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
130620PNER-L		●	●		●		●		●	●	●	—	—	2.0	1
130624PNER-L		●	●		●		●		●	●	●	—	—	2.4	1
130632PNER-L		●	●		●		●		●	●	●	—	—	3.2	1
LNEX 130604PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
130616PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
130620PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.0	1
130624PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.4	1
130632PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	3.2	1
LNEX 130604PNER-H		●	●		●	●	●	●	●			—	—	0.4	1
130608PNER-H		●	●		●	●	●	●	●			—	—	0.8	1
130612PNER-H		●	●		●	●	●	●	●			—	—	1.2	1
130616PNER-H		●	●		●	●	●	●	●			—	—	1.6	1
130620PNER-H		●	●		●	●	●	●	●			—	—	2.0	1
130624PNER-H		●	●		●	●	●	●	●			—	—	2.4	1
130632PNER-H		●	●		●	●	●	●	●			—	—	3.2	1
LNEX 130602PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
130604PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
130608PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
130612PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
130616PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1
130620PNFR-S		—	—	—	—	—	—	—	—	—	—			2.0	1
130624PNFR-S		—	—	—	—	—	—	—	—	—	—			2.4	1
130632PNFR-S		—	—	—	—	—	—	—	—	—	—			3.2	1
LNEX 130604PNEL-L					●				●			—	—	0.4	2
130608PNEL-L					●				●			—	—	0.8	2
130612PNEL-L					●				●			—	—	1.2	2
130616PNEL-L					●				●			—	—	1.6	2
130620PNEL-L					●				●			—	—	2.0	2
130624PNEL-L					●				●			—	—	2.4	2
130632PNEL-L					●				●			—	—	3.2	2
LNEX 130604PNEL-G					●			●	●		●	—	—	0.4	2
130608PNEL-G					●			●	●		●	—	—	0.8	2
130612PNEL-G					●			●	●			—	—	1.2	2
130616PNEL-G					●			●	●			—	—	1.6	2
130620PNEL-G					●			●	●			—	—	2.0	2
130624PNEL-G					●			●	●			—	—	2.4	2
130632PNEL-G					●			●	●			—	—	3.2	2
LNEX 130602PNFL-S		—	—	—	—	—	—	—	—	—	—			0.2	2
130604PNFL-S		—	—	—	—	—	—	—	—	—	—			0.4	2
130608PNFL-S		—	—	—	—	—	—	—	—	—	—			0.8	2
130612PNFL-S		—	—	—	—	—	—	—	—	—	—			1.2	2
130616PNFL-S		—	—	—	—	—	—	—	—	—	—			1.6	2
130620PNFL-S		—	—	—	—	—	—	—	—	—	—			2.0	2
130624PNFL-S		—	—	—	—	—	—	—	—	—	—			2.4	2
130632PNFL-S		—	—	—	—	—	—	—	—	—	—			3.2	2

Fig 1 (Right-Hand)

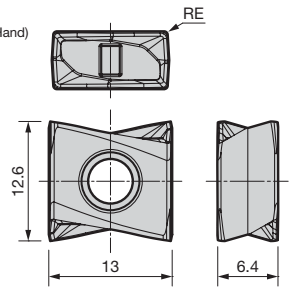
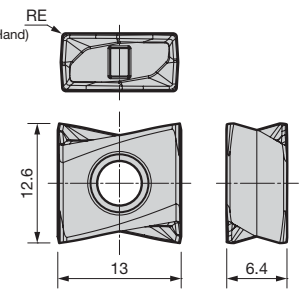


Fig 2 (Left-Hand)



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	150 - **225** - 300	0.10 - **0.30** - 0.40	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	75 - **150** - 230	0.10 - **0.30** - 0.40	
	Alloy Steel	180 to 280HB	100 - **175** - 250	0.10 - **0.25** - 0.35	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.10 - **0.20** - 0.30	ACU2500 ACM200 ACM300
		> 280HB	75 - **125** - 170	0.10 - **0.20** - 0.30	

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
K	Cast Iron/ Ductile Cast Iron	250HB	150 - **175** - 250	0.10 - **0.30** - 0.40	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.10 - **0.15** - 0.20	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT50 machine tools.

● mark: Standard stocked item (new product/expanded item)

TSXF 13000R/L(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-23 to -15°
	Axial	-6°

12mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

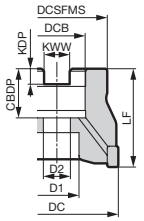


Fig 2

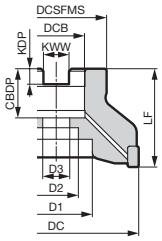


Fig 3

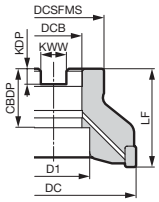


Fig 4

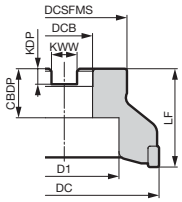


Fig 5

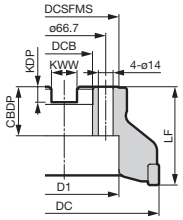


Figure shows right-handed (R) tool.

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Number of Teeth	Weight (kg)	Fig
Metric	**TSXF 13040RS/LS**	●		**40**	33	40	**16**	8.4	5.6	18.0	14	9	—	5	0.18	1
	13050RS/LS	●		**50**	41	40	**22**	10.4	6.3	20.0	18	11	—	6	0.29	1
	13063RS/LS	●		**63**	50	40	**22**	10.4	6.3	20.0	18	11	—	7	0.50	1
	13080RS/LS	●		**80***	55	50	**27**	12.4	7.0	22.0	20	14	—	8	0.92	1
	13100RS/LS	●		**100**	70	50	**32**	14.4	8.0	32.0	46	—	—	10	1.34	3
	13125RS/LS	●		**125**	80	63	**40**	16.4	9.0	29.0	52	29	—	14	2.58	1
	13160RS/LS	●		**160**	130	63	**40**	16.4	9.0	29.0	90	—	—	16	5.08	5
Inch	**TSXF 13080R/L**	●		**80***	55	50	**25.4**	9.5	6.0	25.0	20	14	—	8	0.93	1
	13100R/L	●		**100***	70	63	**31.75**	12.7	8.0	32.0	46	27	18	10	1.88	2
	13125R/L	●		**125**	80	63	**38.1**	15.9	10.0	35.5	55	30	—	14	2.60	1
	13160R/L	●		**160**	100	63	**50.8**	19.1	11.0	38.0	72	—	—	16	4.28	4

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Identification Code

TSX **F** **13** **100** **R** **S**

Series Code	Extra Fine Pitch	Insert Size	Dia.	R: Right-Hand L: Left-Hand	Metric Bore

Parts

Applicable Cutter	Flat Insert Screw	N·m	Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
TSXF 13040RS/LS	BFTX03510IP	3.0	—	HPS1015	TRB15IP	SUMI-P
TSXF 13050RS/LS						
TSXF 13063RS/LS						
TSXF 13080RS/LS						
TSXF 13100RS/LS						
TSXF 13125RS/LS						
TSXF 13160RS/LS			TRDR15IP	—	—	
TSXF 13080R/L			—	HPS1015	TRB15IP	
TSXF 13100R/L						
TSXF 13125R/L						
TSXF 13160R/L			TRDR15IP	—	—	

N·m Recommended Tightening Torque (N·m)

TSXF 13000R/L(S) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	KM KS	PM KM	PM			K	K		MS			N		
	Medium Cutting	KM KS	PM KM	PM	PM		K	K		MS	MS	N	N		
	Roughing	KM KS			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 130604PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
130616PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
130620PNER-L		●	●		●		●		●	●	●	—	—	2.0	1
130624PNER-L		●	●		●		●		●	●	●	—	—	2.4	1
130632PNER-L		●	●		●		●		●	●	●	—	—	3.2	1
LNEX 130604PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
130616PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
130620PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.0	1
130624PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.4	1
130632PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	3.2	1
LNEX 130604PNER-H		●	●		●	●	●	●	●			—	—	0.4	1
130608PNER-H		●	●		●	●	●	●	●			—	—	0.8	1
130612PNER-H		●	●		●	●	●	●	●			—	—	1.2	1
130616PNER-H		●	●		●	●	●	●	●			—	—	1.6	1
130620PNER-H		●	●		●	●	●	●	●			—	—	2.0	1
130624PNER-H		●	●		●	●	●	●	●			—	—	2.4	1
130632PNER-H		●	●		●	●	●	●	●			—	—	3.2	1
LNEX 130602PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
130604PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
130608PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
130612PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
130616PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1
130620PNFR-S		—	—	—	—	—	—	—	—	—	—			2.0	1
130624PNFR-S		—	—	—	—	—	—	—	—	—	—			2.4	1
130632PNFR-S		—	—	—	—	—	—	—	—	—	—			3.2	1
LNEX 130604PNEL-L					●				●			—	—	0.4	2
130608PNEL-L					●				●			—	—	0.8	2
130612PNEL-L					●				●			—	—	1.2	2
130616PNEL-L					●				●			—	—	1.6	2
130620PNEL-L					●				●			—	—	2.0	2
130624PNEL-L					●				●			—	—	2.4	2
130632PNEL-L					●				●			—	—	3.2	2
LNEX 130604PNEL-G					●			●	●		●	—	—	0.4	2
130608PNEL-G					●			●	●		●	—	—	0.8	2
130612PNEL-G					●			●	●			—	—	1.2	2
130616PNEL-G					●			●	●			—	—	1.6	2
130620PNEL-G					●			●	●			—	—	2.0	2
130624PNEL-G					●			●	●			—	—	2.4	2
130632PNEL-G					●			●	●			—	—	3.2	2
LNEX 130602PNFL-S		—	—	—	—	—	—	—	—	—	—			0.2	2
130604PNFL-S		—	—	—	—	—	—	—	—	—	—			0.4	2
130608PNFL-S		—	—	—	—	—	—	—	—	—	—			0.8	2
130612PNFL-S		—	—	—	—	—	—	—	—	—	—			1.2	2
130616PNFL-S		—	—	—	—	—	—	—	—	—	—			1.6	2
130620PNFL-S		—	—	—	—	—	—	—	—	—	—			2.0	2
130624PNFL-S		—	—	—	—	—	—	—	—	—	—			2.4	2
130632PNFL-S		—	—	—	—	—	—	—	—	—	—			3.2	2

Fig 1 (Right-Hand)

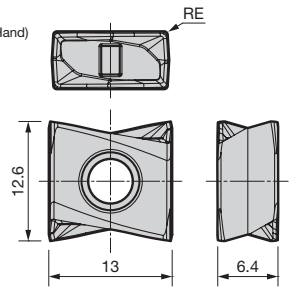
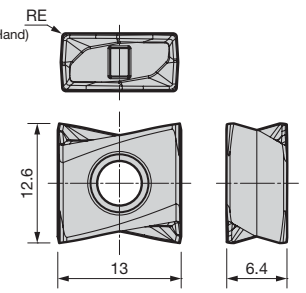


Fig 2 (Left-Hand)



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	150 - **225** - 300	0.10 - **0.30** - 0.40	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	75 - **150** - 230	0.10 - **0.30** - 0.40	
	Alloy Steel	180 to 280HB	100 - **175** - 250	0.10 - **0.25** - 0.35	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.10 - **0.20** - 0.30	ACU2500 ACM200 ACM300
		> 280HB	75 - **125** - 170	0.10 - **0.20** - 0.30	

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
K	Cast Iron/ Ductile Cast Iron	250HB	150 - **175** - 250	0.10 - **0.30** - 0.40	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.10 - **0.15** - 0.20	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT50 machine tools.

● mark: Standard stocked item (new product/expanded item)

TSX(F) 08000E type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Rake Angle	Radial	-36 to -20°
	Axial	-6°

8mm 90°

Face Milling Shoulder Milling Groove Milling Side Milling

Fig 1

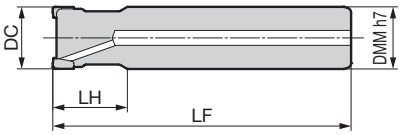
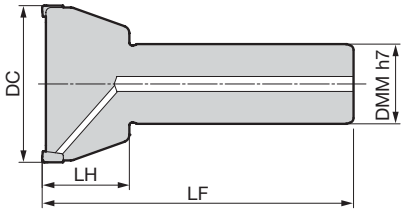


Fig 2



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Shank Dia. DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
Metric	**TSX 08016E**	●	**16**	16	25	100	2	0.13	1
	08020E	●	**20**	20	30	110	2	0.22	1
	08020E-16	●	**20**	16	30	110	2	0.15	2
	08025E	●	**25**	25	30	120	3	0.40	1
	08025E-20	●	**25**	20	30	120	3	0.26	2
	08032E	●	**32**	32	30	120	3	0.67	1
	08032E-25	●	**32**	25	30	120	3	0.43	2
	08040E	●	**40**	32	30	120	4	0.72	2
	08050E	●	**50**	32	30	120	5	0.85	2
	08063E	●	**63**	32	35	125	6	1.09	2
	08080E	●	**80**	32	35	125	7	1.44	2

Inserts are sold separately.

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Shank Dia. DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
Metric	**TSXF 08020E**	●	**20**	20	30	110	3	0.22	1
	08025E	●	**25**	25	30	120	4	0.40	1
	08032E	●	**32**	32	30	120	5	0.67	1
	08040E	●	**40**	32	30	120	6	0.73	2
	08050E	●	**50**	32	30	120	8	0.85	2
	08063E	●	**63**	32	35	125	10	1.10	2
	08080E	●	**80**	32	35	125	11	1.42	2

Inserts are sold separately.

Identification Code

TSX **F** **08** **032** **E** **(-25)**

Series Code	Extra Fine Pitch	Insert Size	Dia.	Shank type	Shank Dia.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
TSX 08016E, TSX 08020E, TSXF 08020E	BFTX0306IP	2.0	TRDR08IP	SUMI-P
TSX 08025E to 80E, TSXF 08025E to 80E	BFTX0308IP			

N·m Recommended Tightening Torque (N·m)

TSX(F) 08000E type

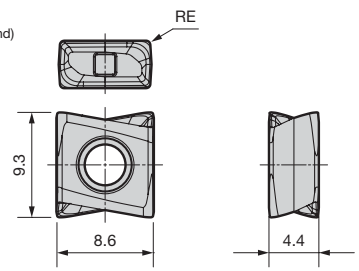
P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	PKMS	PKM	PM			K	K		MS			N		
	Medium Cutting	PKMS	PKM	PM	PM		K	K		MS	MS	N	N		
	Roughing	PKMS			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 080404PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
080408PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
080412PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
080416PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
LNEX 080404PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
080408PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
080412PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
080416PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
LNEX 080402PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
080404PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
080408PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
080412PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
080416PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1

Fig 1 (Right-Hand)



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	150 - **225** - 300	0.08 - **0.20** - 0.30	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	75 - **150** - 230	0.08 - **0.20** - 0.30	
	Alloy Steel	180 to 280HB	100 - **175** - 250	0.08 - **0.15** - 0.25	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.08 - **0.15** - 0.25	ACU2500 ACM200 ACM300
		> 280HB	75 - **125** - 170	0.08 - **0.15** - 0.25	
K	Cast Iron/ Ductile Cast Iron	250HB	150 - **175** - 250	0.08 - **0.20** - 0.30	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.05 - **0.10** - 0.15	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT40 machine tools.

● mark: Standard stocked item (new product/expanded item)

TSX(M/F) 13000E type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

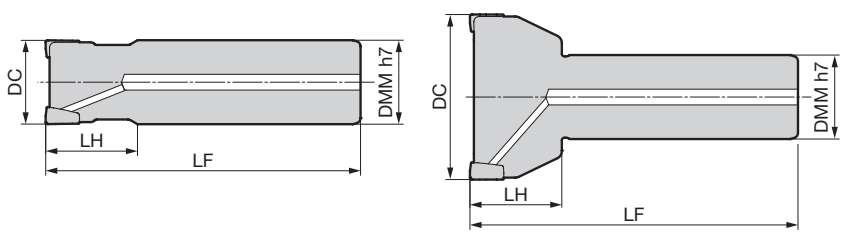
Rake Angle	Radial	-31 to -15°
	Axial	-6°

12mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

Fig 2



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Shank Dia. DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
Metric	**TSX 13025E**	●	**25**	25	35	120	2	0.38	1
	13032E	●	**32**	32	35	120	2	0.66	1
	13040E	●	**40**	32	30	120	3	0.71	2
	13050E	●	**50**	32	30	120	4	0.81	2
	13063E	●	**63**	32	35	125	5	1.08	2
	13080E	●	**80**	32	35	125	5	1.40	2

Inserts are sold separately.

Body (Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Shank Dia. DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
Metric	**TSXM 13032E**	●	**32**	32	35	120	3	0.65	1
	13040E	●	**40**	32	30	120	4	0.71	2
	13050E	●	**50**	32	30	120	5	0.80	2
	13063E	●	**63**	32	35	125	6	1.07	2
	13080E	●	**80**	32	35	125	7	1.41	2

Inserts are sold separately.

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Shank Dia. DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
Metric	**TSXF 13040E**	●	**40**	32	30	120	5	0.70	2
	13050E	●	**50**	32	30	120	6	0.80	2
	13063E	●	**63**	32	35	125	7	1.07	2
	13080E	●	**80**	32	35	125	8	1.42	2

Inserts are sold separately.

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX03510IP	3.0	TRDR15IP	SUMI-P

Identification Code

TSX **M** **13** **050** **E**

Series Code	M: Fine Pitch F: Extra Fine Pitch	Insert Size	Dia.	Shank type

N·m Recommended Tightening Torque (N·m)

TSX(M/F) 13000E type

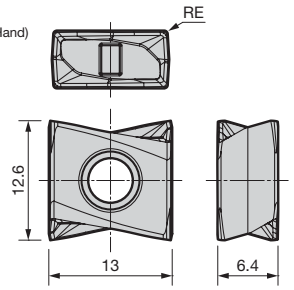
P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	KM	PM	PM			K	K		MS			N		
	Medium Cutting	KM	PM	PM	PM		K	K		MS	MS	N	N		
	Roughing	KM			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 130604PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
130616PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
130620PNER-L		●	●		●		●		●	●	●	—	—	2.0	1
130624PNER-L		●	●		●		●		●	●	●	—	—	2.4	1
130632PNER-L		●	●		●		●		●	●	●	—	—	3.2	1
LNEX 130604PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
130616PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
130620PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.0	1
130624PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.4	1
130632PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	3.2	1
LNEX 130604PNER-H		●	●		●	●	●	●	●			—	—	0.4	1
130608PNER-H		●	●		●	●	●	●	●			—	—	0.8	1
130612PNER-H		●	●		●	●	●	●	●			—	—	1.2	1
130616PNER-H		●	●		●	●	●	●	●			—	—	1.6	1
130620PNER-H		●	●		●	●	●	●	●			—	—	2.0	1
130624PNER-H		●	●		●	●	●	●	●			—	—	2.4	1
130632PNER-H		●	●		●	●	●	●	●			—	—	3.2	1
LNEX 130602PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
130604PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
130608PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
130612PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
130616PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1
130620PNFR-S		—	—	—	—	—	—	—	—	—	—			2.0	1
130624PNFR-S		—	—	—	—	—	—	—	—	—	—			2.4	1
130632PNFR-S		—	—	—	—	—	—	—	—	—	—			3.2	1

Fig 1 (Right-Hand)



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	150 - **225** - 300	0.10 - **0.30** - 0.40	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	75 - **150** - 230	0.10 - **0.30** - 0.40	
	Alloy Steel	180 to 280HB	100 - **175** - 250	0.10 - **0.25** - 0.35	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.10 - **0.20** - 0.30	ACU2500 ACM200 ACM300
		> 280HB	75 - **125** - 170	0.10 - **0.20** - 0.30	
K	Cast Iron/ Ductile Cast Iron	250HB	150 - **175** - 250	0.10 - **0.30** - 0.40	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.10 - **0.15** - 0.20	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT50 machine tools.

● mark: Standard stocked item (new product/expanded item)

TSXR 08000RS type

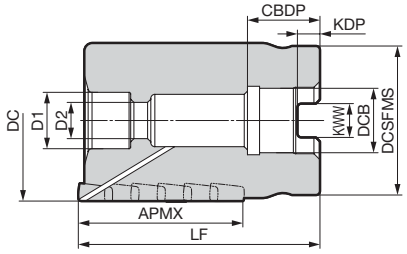
P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-20 to -15°
	Axial	-6 to -3°

34 to 60 mm | 90°

Shoulder Milling | Side Milling

Fig 1



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
Metric	**TSXR 08032RS3416Z02**	●	**32**	34	33	55	**16**	8.4	5.6	18.0	14	9	10	5	2	0.17	1
	08040RS4016Z03	●	**40**	40	37	60	**16**	8.4	5.6	18.0	14	9	18	6	3	0.32	1
	08050RS5422Z03	●	**50**	54	47	75	**22**	10.4	6.3	20.0	18	11	24	8	3	0.70	1
	08050RS5422Z04	●	**50**	54	47	75	**22**	10.4	6.3	20.0	18	11	32	8	4	0.68	1
	08063RS6027Z05	●	**63**	60	60	80	**27**	12.4	7.0	22.0	20	14	45	9	5	1.25	1

Inserts are sold separately.

Identification Code

TSXR Series Code | **08** Insert Size | **050** Dia. | **R** Right Hand | **S** Metric Bore | **54** Max. Depth of Cut | **22** Mounting Hole Diameter | **Z03** Effective No. of Teeth

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Bolt	Anti-seizure Cream
TSXR 08032RS3416Z02	BFTX0308IP	2.0	TRDR08IP	BX0845	SUMI-P
TSXR 08040RS4016Z03				BX0850	
TSXR 08050RS5422Z03				BX1060	
TSXR 08050RS5422Z04					
TSXR 08063RS6027Z05				BX1265	

N·m Recommended Tightening Torque (N·m)

TSXR 08000RS type

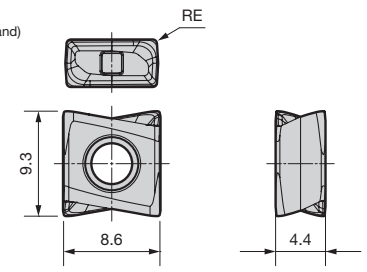
P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	KM MS	PM KM	PM			K	K		MS			N		
	Medium Cutting	KM MS	PM KM	PM	PM		K	K		MS	MS	N	N		
	Roughing	KM MS			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 080404PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
080408PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
080412PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
080416PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
LNEX 080404PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
080408PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
080412PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
080416PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
LNEX 080402PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
080404PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
080408PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
080412PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
080416PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1

Fig 1 (Right-Hand)



Use peripheral inserts with RE of 0.8mm or less from the second step and above.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	110 - **200** - 280	0.08 - **0.20** - 0.30	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	70 - **135** - 200	0.08 - **0.20** - 0.30	
	Alloy Steel	180 to 280HB	90 - **155** - 220	0.08 - **0.15** - 0.25	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.08 - **0.15** - 0.25	ACU2500 ACM200 ACM300
		> 280HB	70 - **115** - 160	0.08 - **0.15** - 0.25	
K	Cast Iron/ Ductile Cast Iron	250HB	125 - **175** - 225	0.08 - **0.20** - 0.30	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.05 - **0.10** - 0.15	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT50 machine tools.
- The above are the recommended cutting conditions for ae = diameter DC 20% or less.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

TSXR 13000RS type

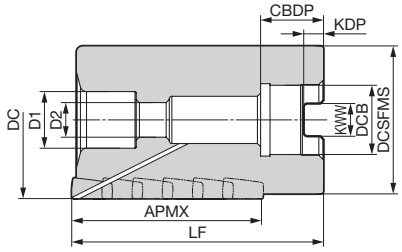
P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle		
	Radial	-23 to -15°
	Axial	-6 to -3°

41 to 60 mm, 90°

Shoulder Milling | Side Milling

Fig 1



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
Metric	**TSXR 13040RS4116Z02**	●	**40**	41	37	60	**16**	8.4	5.6	18.0	14	9	8	4	2	0.31	1
	13050RS6022Z03	●	**50**	60	47	80	**22**	10.4	6.3	20.0	18	11	18	6	3	0.66	1
	13063RS5027Z03	●	**63**	50	60	75	**27**	12.4	7.0	22.0	20	14	15	5	3	1.12	1
	13063RS6027Z04	●	**63**	60	60	80	**27**	12.4	7.0	22.0	20	14	24	6	4	1.15	1
	13080RS6032Z04	●	**80**	60	77	80	**32**	14.4	8.0	26.0	25	18	24	6	4	2.06	1
	13080RS6032Z05	●	**80**	60	77	80	**32**	14.4	8.0	26.0	25	18	30	6	5	2.04	1
	13100RS6040Z05	●	**100**	60	88	85	**40**	16.4	9.0	29.0	32	21	30	6	5	3.45	1
	13100RS6040Z06	●	**100**	60	88	85	**40**	16.4	9.0	29.0	32	21	36	6	6	3.44	1
	13125RS6040Z07	●	**125**	60	100	85	**40**	16.4	9.0	29.0	32	21	42	6	7	5.63	1

Inserts are sold separately.

Identification Code

TSXR	13	050	R	S	60	22	Z03
Series Code	Insert Size	Dia.	Right Hand	Metric Bore	Max. Depth of Cut	Mounting Hole Diameter	Effective No. of Teeth

Parts

Applicable Cutter	Flat Insert Screw	N·m	Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Bolt	Anti-seizure Cream
TSXR 13040RS4116Z02	BFTX03510IP	3.0	—	HPS1015	TRB15IP	BX0850	SUMI-P
TSXR 13050RS6022Z03						BX1060	
TSXR 13063RS5027Z03						BX1260	
TSXR 13063RS6027Z04						BX1265	
TSXR 13080RS6032Z04			TRDR15IP	—	—	BX1660	
TSXR 13080RS6032Z05							
TSXR 13100RS6040Z05						BX2065	
TSXR 13100RS6040Z06							
TSXR 13125RS6040Z07							

N·m Recommended Tightening Torque (N·m)

TSXR 13000RS type

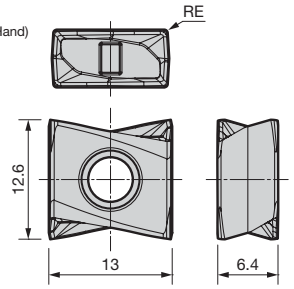
P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	KM KS	PM KM	PM			K	K		MS			N		
	Medium Cutting	KM KS	PM KM	PM	PM		K	K		MS	MS	N	N		
	Roughing	KM KS			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 130604PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
130616PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
130620PNER-L		●	●		●		●		●	●	●	—	—	2.0	1
130624PNER-L		●	●		●		●		●	●	●	—	—	2.4	1
130632PNER-L		●	●		●		●		●	●	●	—	—	3.2	1
LNEX 130604PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
130616PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
130620PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.0	1
130624PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.4	1
130632PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	3.2	1
LNEX 130604PNER-H		●	●		●	●	●	●	●			—	—	0.4	1
130608PNER-H		●	●		●	●	●	●	●			—	—	0.8	1
130612PNER-H		●	●		●	●	●	●	●			—	—	1.2	1
130616PNER-H		●	●		●	●	●	●	●			—	—	1.6	1
130620PNER-H		●	●		●	●	●	●	●			—	—	2.0	1
130624PNER-H		●	●		●	●	●	●	●			—	—	2.4	1
130632PNER-H		●	●		●	●	●	●	●			—	—	3.2	1
LNEX 130602PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
130604PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
130608PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
130612PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
130616PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1
130620PNFR-S		—	—	—	—	—	—	—	—	—	—			2.0	1
130624PNFR-S		—	—	—	—	—	—	—	—	—	—			2.4	1
130632PNFR-S		—	—	—	—	—	—	—	—	—	—			3.2	1

Fig 1 (Right-Hand)



Use peripheral inserts with RE of 0.8mm or less from the second step and above.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	110 - **200** - 280	0.10 - **0.20** - 0.30	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	70 - **135** - 200	0.10 - **0.20** - 0.30	
	Alloy Steel	180 to 280HB	90 - **155** - 220	0.10 - **0.15** - 0.25	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.10 - **0.15** - 0.25	ACU2500 ACM200 ACM300
		> 280HB	70 - **115** - 160	0.10 - **0.15** - 0.25	
K	Cast Iron/ Ductile Cast Iron	250HB	125 - **175** - 225	0.10 - **0.20** - 0.30	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.05 - **0.10** - 0.15	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT50 machine tools.
- The above are the recommended cutting conditions for a_e = diameter DC 20% or less.

● mark: Standard stocked item (new product/expanded item)

TSXR 08000E type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle		
	Radial	-33 to -18°
	Axial	-6° to -3°

21 to 40 mm | 90°

Shoulder Milling | Side Milling

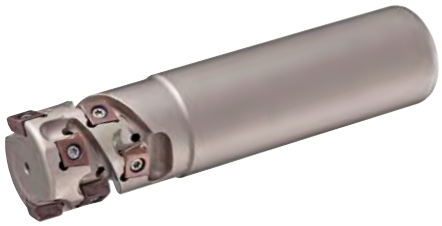


Fig 1

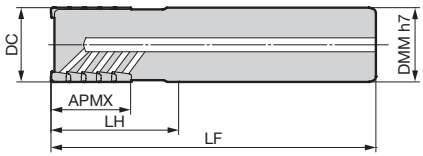
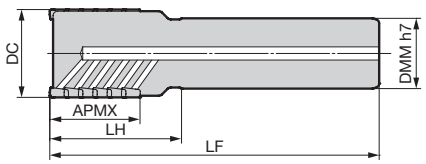


Fig 2



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank Dia. DMM	Head LH	Overall Length LF	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
Metric	**TSXR 08020E2120Z01**	●	**20**	21	20	30	110	3	3	1	0.22	1
	08025E2725Z02	●	**25**	27	25	35	125	8	4	2	0.39	1
	08032E3432Z02	●	**32**	34	32	50	140	10	5	2	0.74	1
	08040E4032Z03	●	**40**	40	32	60	150	18	6	3	0.92	2

Inserts are sold separately.

Identification Code

TSXR	08	025	E	27	25	Z02
Series Code	Insert Size	Dia.	Shank type	Max. Depth of Cut	Shank Dia.	Effective No. of Teeth

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0308IP	2.0	TRDR08IP	SUMI-P

N·m Recommended Tightening Torque (N·m)

TSXR 08000E type

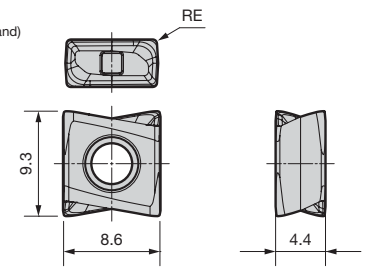
P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	KM KS	PM KM	PM			K	K		MS			N		
	Medium Cutting	KM KS	PM KM	PM	PM		K	K		MS	MS	N	N		
	Roughing	KM KS			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 080404PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
080408PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
080412PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
080416PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
LNEX 080404PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
080408PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
080412PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
080416PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
LNEX 080402PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
080404PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
080408PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
080412PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
080416PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1

Fig 1 (Right-Hand)



Use peripheral inserts with RE of 0.8mm or less from the second step and above.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	110 - **200** - 280	0.08 - **0.20** - 0.30	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	70 - **135** - 200	0.08 - **0.20** - 0.30	
	Alloy Steel	180 to 280HB	90 - **155** - 220	0.08 - **0.15** - 0.25	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.08 - **0.15** - 0.25	ACU2500 ACM200 ACM300
		> 280HB	70 - **115** - 160	0.08 - **0.15** - 0.25	
K	Cast Iron/ Ductile Cast Iron	250HB	125 - **175** - 225	0.08 - **0.20** - 0.30	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.05 - **0.10** - 0.15	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT50 machine tools.
- The above are the recommended cutting conditions for ae = diameter DC 20% or less.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

TSXR 13000E type

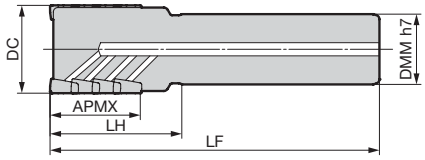
P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-23 to -18°
	Axial	-6° to -3°

41 to 60 mm | 90°

Shoulder Milling | Side Milling

Fig 1



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank Dia. DMM	Head LH	Overall Length LF	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
Metric	**TSXR 13040E4132Z02**	●	**40**	41	32	60	150	8	4	2	0.91	1
	13050E6042Z03	●	**50**	60	42	80	170	18	6	3	1.74	1

Inserts are sold separately.

Identification Code

TSXR	13	050	E	60	42	Z03
Series Code	Insert Size	Dia.	Shank type	Max. Depth of Cut	Shank Dia.	Effective No. of Teeth

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX03510IP	3.0	TRDR15IP	SUMI-P

N·m Recommended Tightening Torque (N·m)

TSXR 13000E type

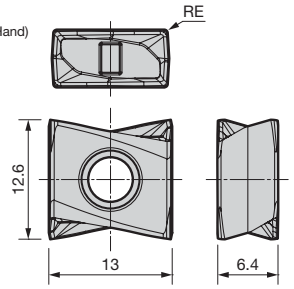
P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC		
Process	High-speed/Light Cutting	KM KS	PM KM	PM			K	K		MS			N		
	Medium Cutting	KM KS	PM KM	PM	PM		K	K		MS	MS	N	N		
	Roughing	KM KS			PM	PM			K		MS				
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H20	DL2000	Corner Radius RE	Fig
LNEX 130604PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-L		●	●		●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-L		●	●		●		●		●	●	●	—	—	1.2	1
130616PNER-L		●	●		●		●		●	●	●	—	—	1.6	1
130620PNER-L		●	●		●		●		●	●	●	—	—	2.0	1
130624PNER-L		●	●		●		●		●	●	●	—	—	2.4	1
130632PNER-L		●	●		●		●		●	●	●	—	—	3.2	1
LNEX 130604PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.4	1
130608PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	0.8	1
130612PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.2	1
130616PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	1.6	1
130620PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.0	1
130624PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	2.4	1
130632PNER-G		●	●	●	●	●	●	●	●	●	●	—	—	3.2	1
LNEX 130604PNER-H		●	●		●	●	●	●	●			—	—	0.4	1
130608PNER-H		●	●		●	●	●	●	●			—	—	0.8	1
130612PNER-H		●	●		●	●	●	●	●			—	—	1.2	1
130616PNER-H		●	●		●	●	●	●	●			—	—	1.6	1
130620PNER-H		●	●		●	●	●	●	●			—	—	2.0	1
130624PNER-H		●	●		●	●	●	●	●			—	—	2.4	1
130632PNER-H		●	●		●	●	●	●	●			—	—	3.2	1
LNEX 130602PNFR-S		—	—	—	—	—	—	—	—	—	—			0.2	1
130604PNFR-S		—	—	—	—	—	—	—	—	—	—			0.4	1
130608PNFR-S		—	—	—	—	—	—	—	—	—	—			0.8	1
130612PNFR-S		—	—	—	—	—	—	—	—	—	—			1.2	1
130616PNFR-S		—	—	—	—	—	—	—	—	—	—			1.6	1
130620PNFR-S		—	—	—	—	—	—	—	—	—	—			2.0	1
130624PNFR-S		—	—	—	—	—	—	—	—	—	—			2.4	1
130632PNFR-S		—	—	—	—	—	—	—	—	—	—			3.2	1

Fig 1 (Right-Hand)



Use peripheral inserts with RE of 0.8mm or less from the second stage and above.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	110 - **200** - 280	0.10 - **0.20** - 0.30	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	70 - **135** - 200	0.10 - **0.20** - 0.30	
	Alloy Steel	180 to 280HB	90 - **155** - 220	0.10 - **0.15** - 0.25	
M	Stainless Steel	220 to 280HB	90 - **135** - 180	0.10 - **0.15** - 0.25	ACU2500 ACM200 ACM300
		> 280HB	70 - **115** - 160	0.10 - **0.15** - 0.25	
K	Cast Iron/ Ductile Cast Iron	250HB	125 - **175** - 225	0.10 - **0.20** - 0.30	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	—	30 - **60** - 90	0.05 - **0.10** - 0.15	ACU2500 ACM200 ACM300

Note
- The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.
- The above figures are guidelines for use with BT50 machine tools.
- The above are the recommended cutting conditions for a_e = diameter DC 20% or less.

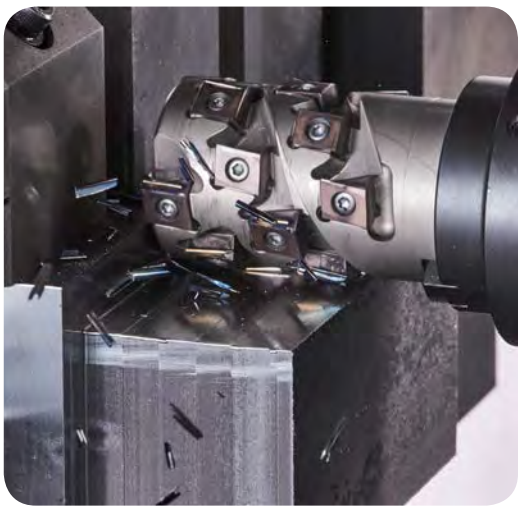
● mark: Standard stocked item (new product/expanded item)

SEC-Sumi Dual Mill TSX series Repeater Made-To-Order Request Sheet (1)

Select a cutter design and enter the dimensions in ☐.

After completion, send the sheet to our nearest sales office or distributor.
Feel free to contact us for other shapes or dimensions or with other requests.

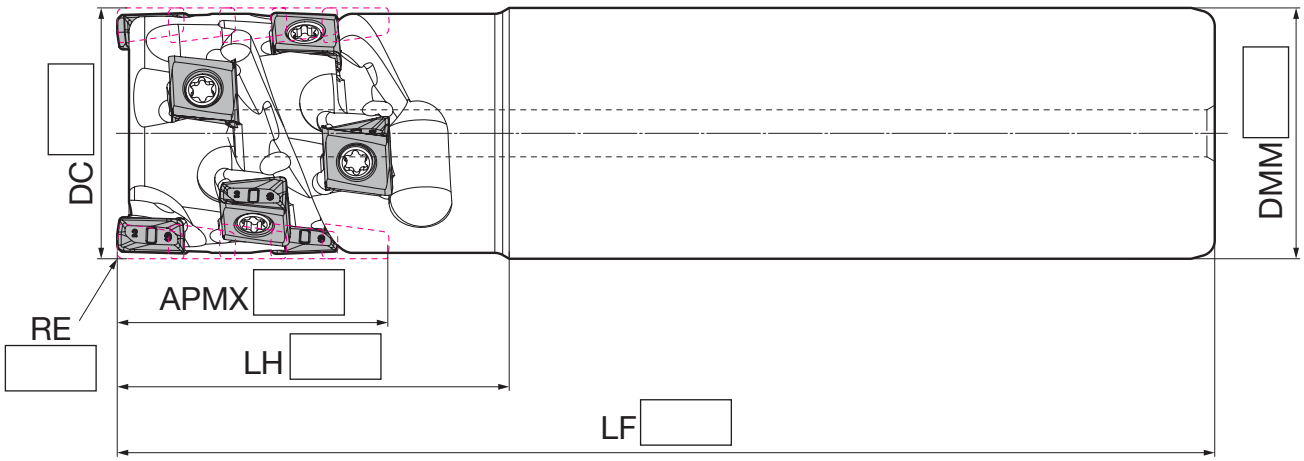
Company Name/Contact



Reference Specifications

Applicable Inserts	Dia. (mm) DC	Max. Depth of Cut (mm) APMX	Total No. of Teeth	No. of Stages	Max. Effective No. of Teeth	Specifications: Shell type	Specifications: Shank type
LNEX08 (Refer to H141)	20	21	3	3	1		○
	25	27	8	4	2		○
	32	34	10	5	2	○	○
	40	40	18	6	3	○	○
	50	54	32	8	4	○	
	63	60	45	9	5	○	
LNEX13 (Refer to H143)	40	41	8	4	2	○	○
	50	60	18	6	3	○	○
	63	60	24	6	4	○	
	80	60	30	6	5	○	
	100	60	36	6	6	○	
	125	60	42	6	7	○	

☐ **Shank type** Refer to the reference specifications above when completing.



■ Accessories

Flat Insert Screw	Wrench	Anti-seizure Cream

- The tip insert corner radius (RE) can be selected. (Applicable size: Refer to H127 ■ Product Range) Other inserts are all RE = 0.8mm or less.
- Effective No. of Teeth Desired: ☐
- Coolant Hole: Yes ☐ No ☐

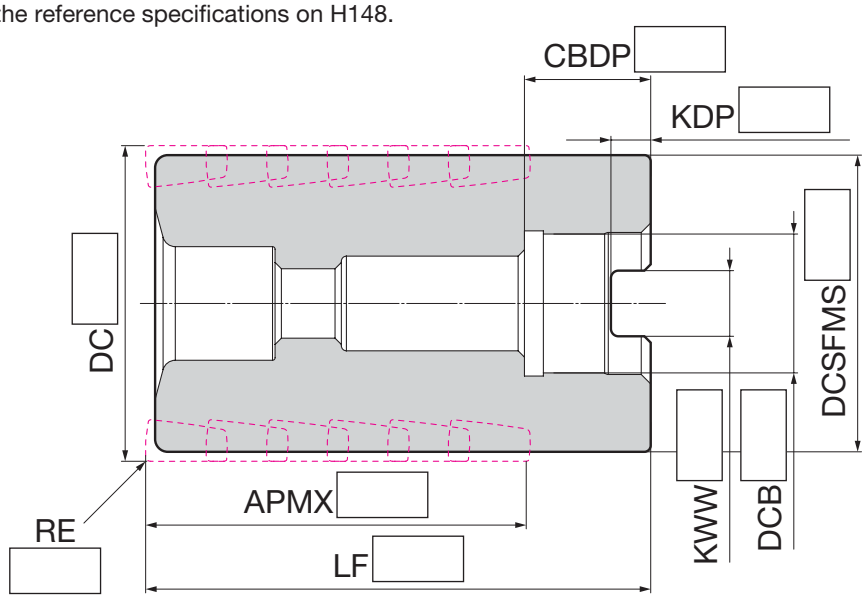
SEC-Sumi Dual Mill TSX series Repeater Made-To-Order Request Sheet (2)

Select a cutter design and enter the dimensions in ☐.

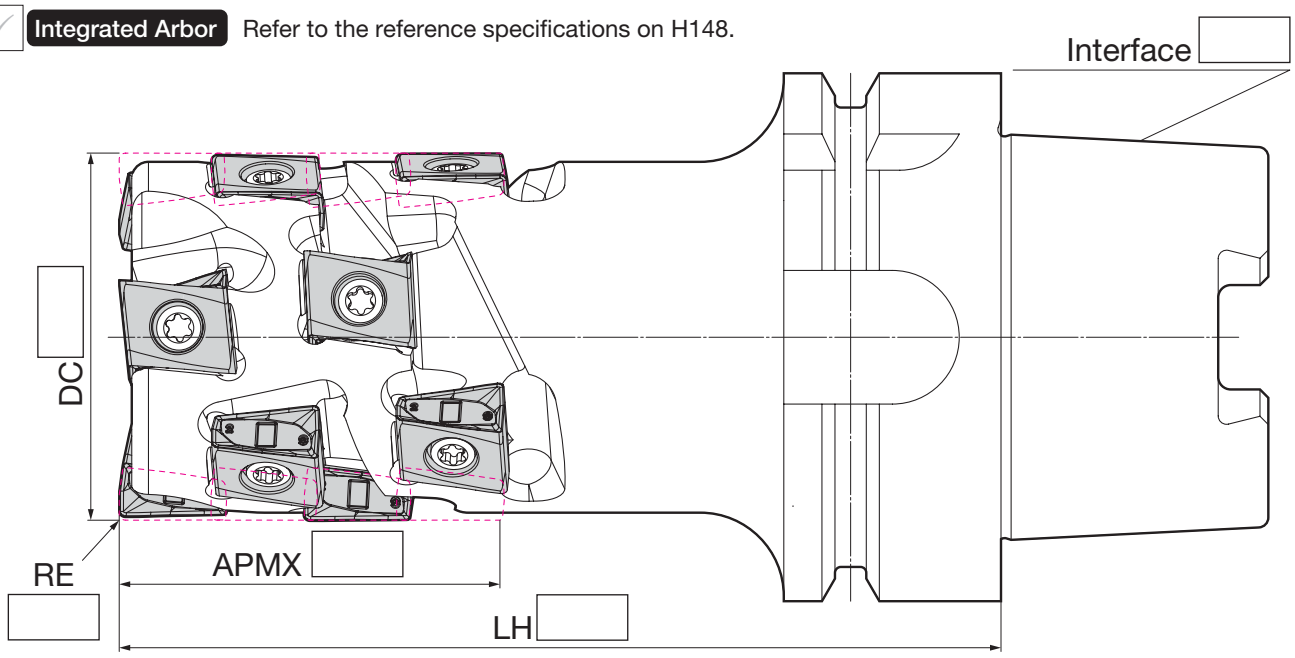
After completion, send the sheet to our nearest sales office or distributor.
Feel free to contact us for other shapes or dimensions or with other requests.

Company Name/Contact

☑ **Shell** Refer to the reference specifications on H148.



☑ **Integrated Arbor** Refer to the reference specifications on H148.



■ Accessories

Flat Insert Screw	Wrench	Bolt	Anti-seizure Cream
		*Shell type Only	

- The tip insert corner radius (RE) can be selected. (Applicable size: Refer to H127 ■ Product Range) Other inserts are all RE = 0.8mm or less.
- Effective No. of Teeth Desired: ☐
- Coolant Hole: Yes ☑ No ☑

SEC-Sumi Dual Mill TSX series Side Cutter Made-To-Order Sheet

Company Name/Contact

Select a cutter design and enter the dimensions in ☐.

After completion, send the sheet to our nearest sales office or distributor.
Feel free to contact us for other shapes or dimensions or with other requests.

■ Insert Series Configuration

Cat. No.	Corner Radius RE (mm)						
	0.4	0.8	1.2	1.6	2.0	2.4	3.2
LNEX 0804○○PNER/L-L	●	●	●	●	—	—	—
LNEX 0804○○PNER/L-G	●	●	●	●	—	—	—
LNEX 1306○○PNER/L-L	●	●	●	●	●	●	●
LNEX 1306○○PNER/L-G	●	●	●	●	●	●	●
LNEX 1306○○PNER-H	●	●	●	●	●	●	●

— mark: Not available

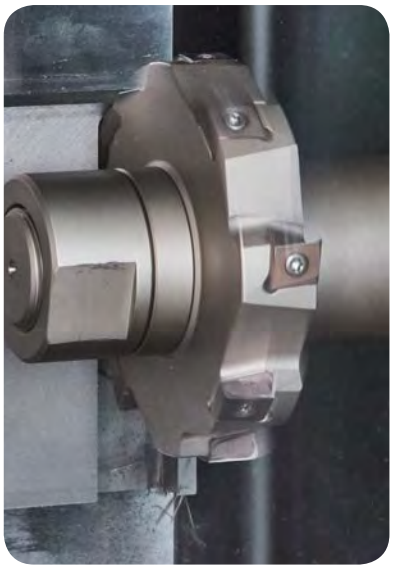
[Insert Special Orders]
LNEX08 has Corner Radius (RE) = 0.4 to 1.6mm
LNEX13 has Corner Radius (RE) = 0.4 to 3.2mm.
Both right-hand and left-hand types are supported.
(Radius shape after machining may differ from the mounted insert corner radius RE size.)
LNEX1306○○PNEL-H (left-handed H type chipbreaker) is not available.

CW Size Reference Specification	
14mm	LNEX08 (Refer to H141)
18 to 22mm	LNEX13 (Refer to H143)

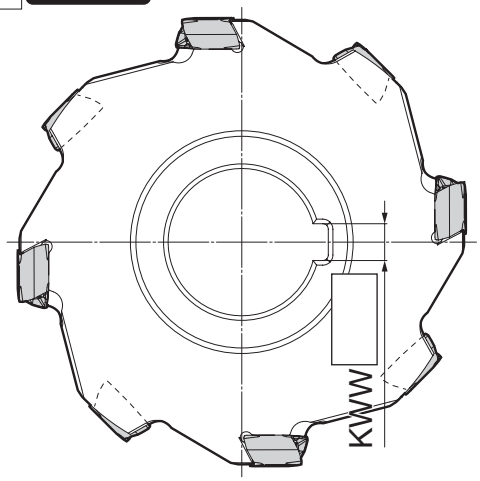
A multi-stage design is required if the CW size exceeds the above.

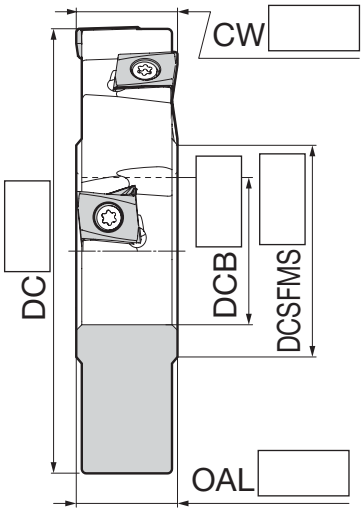
■ Accessories

Flat Insert Screw	Wrench	Anti-seizure Cream

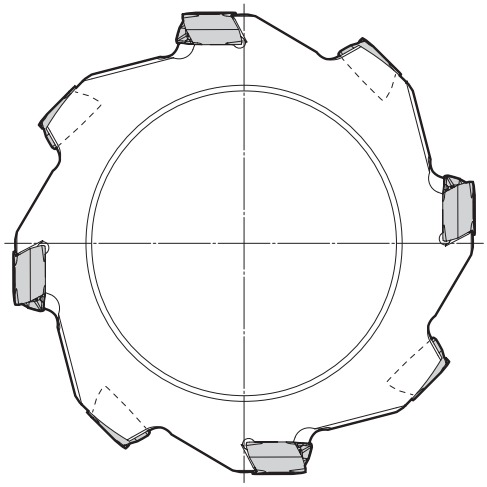


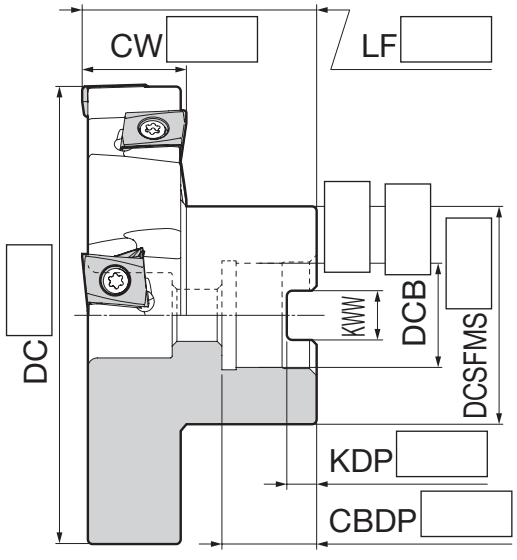
☑ **Disc type**





☑ **Boss type**





· Effective No. of Teeth Desired: ☐

SEC-Sumi Dual Mill TSX series Made-To-Order Request Sheet

Select a cutter design and enter the dimensions in □.

After completion, send the sheet to our nearest sales office or distributor.
Feel free to contact us for other shapes or dimensions or with other requests.

Company Name/Contact

■ Insert Series Configuration

Cat. No.	Corner Radius RE (mm)						
	0.4	0.8	1.2	1.6	2.0	2.4	3.2
LNEX 0804○○PNER/L-L	●	●	●	●	—	—	—
LNEX 0804○○PNER/L-G	●	●	●	●	—	—	—
LNEX 1306○○PNER/L-L	●	●	●	●	●	●	●
LNEX 1306○○PNER/L-G	●	●	●	●	●	●	●
LNEX 1306○○PNER-H	●	●	●	●	●	●	●

— mark: Not available

[Insert Special Orders]
LNEX08 has Corner Radius (RE) = 0.4 to 1.6mm
LNEX13 has Corner Radius (RE) = 0.4 to 3.2mm.
Both right-hand and left-hand types are supported.
(Radius shape after machining may differ from the mounted insert corner radius RE size.)
LNEX1306○○PNEL-H (left-handed H type chipbreaker) is not available.

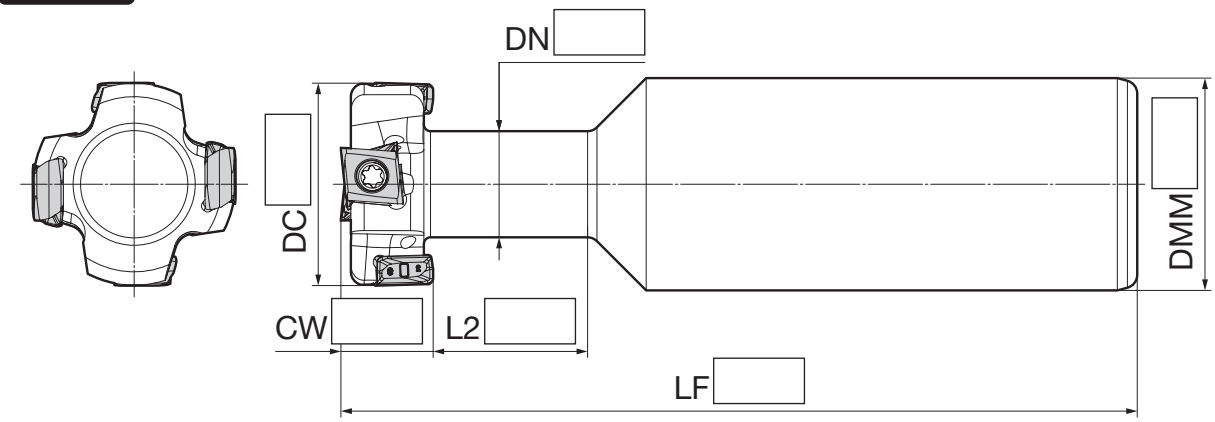
CW Size Reference Specification	
14mm	LNEX08 (Refer to H141)
18 to 22mm	LNEX13 (Refer to H143)

A multi-stage design is required if the CW size exceeds the above.

■ Accessories

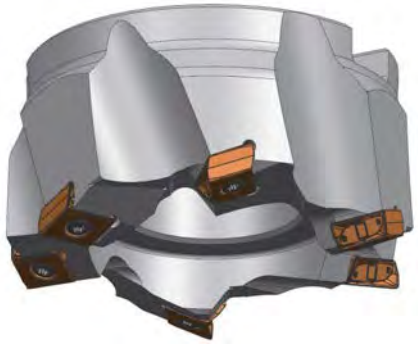
Flat Insert Screw	Wrench	Anti-seizure Cream

☑ T-Slot type



· Effective No. of Teeth Desired: □ · Coolant Hole: Yes ☑ No ☑

■ Angled cutters, high-feed cutters and bore cutters can be designed. For details, please contact us.



PWC(F) 4000 type

K Cast Iron

Rake Angle		
Rake	Radial	-15°
Angle	Axial	-5°

15mm 88°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

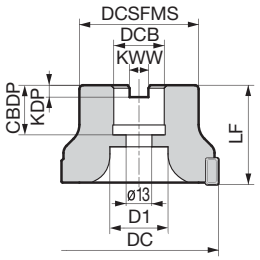


Fig 2

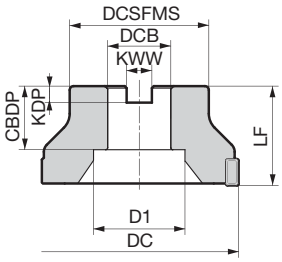


Fig 3

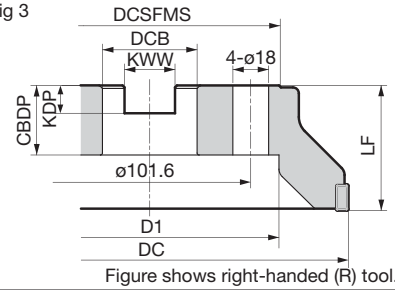


Figure shows right-handed (R) tool.

Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Weight (kg)	Fig
Inch	**PWC 4080R/L**	●		**80**	60	50	**25.4**	9.5	6	25	29.5	7	0.9	1
	4100R/L	●		**100**	70	50	**31.75**	12.7	8	32	46	8	1.3	2
	4125R/L	●		**125**	80	63	**38.1**	15.9	10	38	56	10	2.5	2
	4160R/L	●		**160**	100	63	**50.8**	19.1	11	38	72	12	4.2	2
	4200R/L	●		**200**	150	63	**47.625**	25.4	14	35	130	16	7.2	3

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Weight (kg)	Fig
Inch	**PWCF 4080R/L**	●		**80**	60	50	**25.4**	9.5	6	25	29.5	9	0.9	1
	4100R/L	●		**100**	70	50	**31.75**	12.7	8	32	46	12	1.4	2
	4125R/L	●		**125**	80	63	**38.1**	15.9	10	38	56	15	2.6	2
	4160R/L	●		**160**	100	63	**50.8**	19.1	11	38	72	18	4.3	2
	4200R/L	●		**200**	150	63	**47.625**	25.4	14	35	130	24	7.4	3

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide		
Process	High-speed/Light Cutting	K	K	
	General-purpose	K	K	
	Roughing			K

Cat. No.	ACK100	ACK200	ACK300	Applications	Remarks	Fig
LNMX 160608PNSN-G		●	●	General-purpose machining	1st Recommendation	1
160608PNSN-H	●	●	●	Heavy interrupted cutting and other unstable applications		2

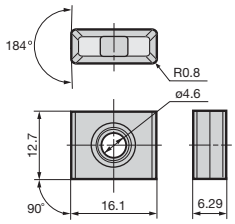
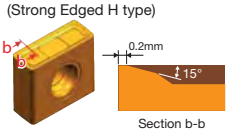


Fig 1
(General-purpose G type)

Section a-a

Fig 2
(Strong Edged H type)



Section b-b

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0412N	3.0	TTX15W	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
K	Cast Iron	250HB	150-**250**-350	0.10-**0.23**-0.35	ACK200/ACK300
	Ductile Cast Iron	250HB	100-**200**-300	0.05-**0.18**-0.30	ACK100/ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

PWS(F) series/PWSR series

■ Features

A highly reliable cutter equipped with tangentially-mounted inserts that combines unprecedented high cutting edge strength and sharpness.
PWSR type, with a 2-stage insert array structure supporting large depths of cut, has been added to the lineup.

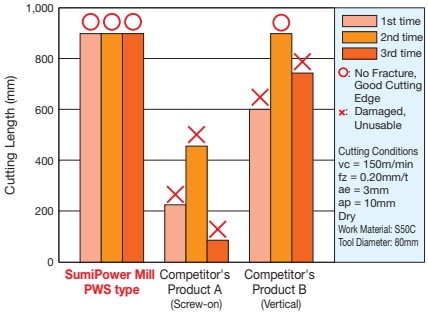
- Tangential inserts with excellent cutting edge strength and optimised breaker provide superb cutting edge and sharpness.
- Nicked insert design created with high-precision molding technology allows stable milling and low chatter even in applications with large tool overhang.

■ Performance

● General-purpose G type Insert Performance Comparison

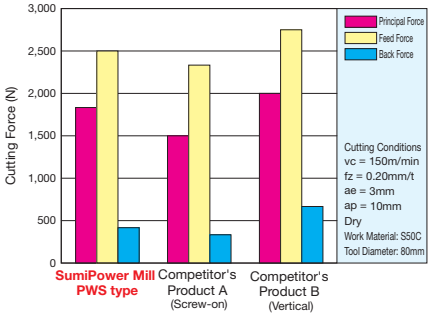
Comparison of Cutting Edge Strength

Strong cutting edge delivers superb stability



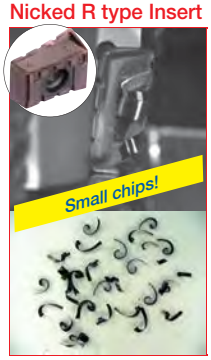
Comparison of Cutting Force

Sharpness approaching that of screw-on inserts



● Nicked R type Insert Performance Comparison

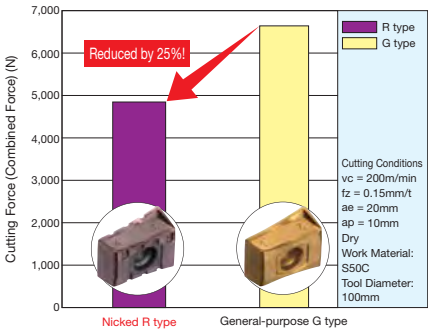
Nicked R type Insert



General-purpose G type Insert

Comparison of Cutting Force

Reduced cutting power and excellent chatter resistance

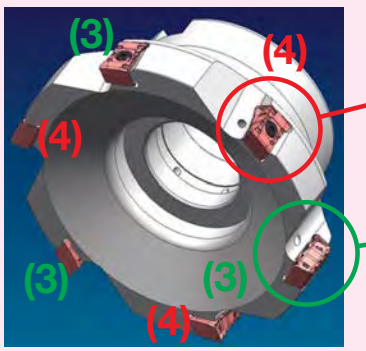


■ Product Range

Type	Cat. No.	Dia. (mm) ø80	ø100	ø125	ø160	ø200	ø250
Shell	PWS 4000R (inch)	4	6	6	8	10	12
	PWSF 4000R (inch)	6	8	8	10	12	14
	PWSR 4000	(4)	(6)	(6)	(8)	(10)	

Number in ●○ shows the number of teeth (inch) Inch Bore

⚠ Nicked R type Insert Usage Precautions



1) Precautions when Mounting
When using the nicked R type indexable inserts, mount them so that the nicked grooves alternate as shown in the image on the left.

2) Precautions for Cutting Conditions
When the inserts are mounted as shown in the left figure, the feed rate per tooth is doubled that of mounting inserts with the same edge design. As such, set feed rate

fz = 0.25mm/t

as the upper limit and adjust accordingly. .

Ex.) For use with fz = 0.2mm/t
With all regular inserts: feed rate per tooth 0.2mm/t
With nicked type inserts: feed rate per tooth 0.4mm/t

Using inserts incorrectly may damage tools.

PWS(F) 4000 type

P Steel | M Stainless Steel | K Cast Iron

Rake Angle	Radial	-15°
	Axial	-6°

16mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

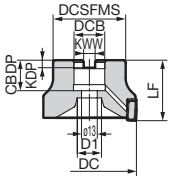
Fig 1


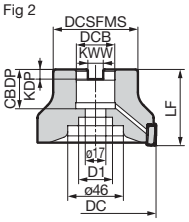
Fig 2


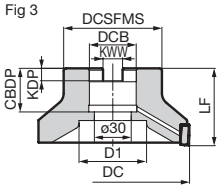
Fig 3


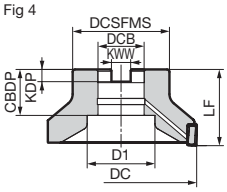
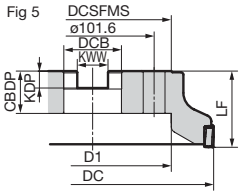
Fig 4


Fig 5


Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Weight (kg)	Fig
Inch	**PWS 4080R**	●	*80	60	50	**25.4**	9.5	6	25	20	4	1.0	1
	4100R	●	*100	70	63	**31.75**	12.7	8	32.5	28	6	1.8	2
	4125R	●	**125**	80	63	**38.1**	15.9	10	35.5	55	6	2.4	3
	4160R	●	**160**	100	63	**50.8**	19.1	11	41.5	72	8	4.0	4
	4200R	●	**200**	130	63	**47.625**	25.4	14	35	130	10	6.6	5
	4250R	●	**250**	130	63	**47.625**	25.4	14	35	160	12	12.4	5

Cutters ø200mm or larger do not have oil holes but come with shims.
Inserts are sold separately.

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Weight (kg)	Fig
Inch	**PWSF 4080R**	●	*80	60	50	**25.4**	9.5	6	25	20	6	0.9	1
	4100R	●	*100	70	63	**31.75**	12.7	8	32.5	28	8	1.7	2
	4125R	●	**125**	80	63	**38.1**	15.9	10	35.5	55	8	2.3	3
	4160R	●	**160**	100	63	**50.8**	19.1	11	41.5	72	10	3.9	4
	4200R	●	**200**	130	63	**47.625**	25.4	14	35	130	12	6.6	5
	4250R	●	**250**	130	63	**47.625**	25.4	14	35	160	14	12.5	5

Cutters ø200mm or larger do not have oil holes but come with shims.
Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	P			K	
	General-purpose		PM	PM	K	
	Roughing		PM	PM		K

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	Applications	Remarks	Fig
LNMX 170808PNSR-L	●	●	●	●	●	Light Cutting		1
170808PNSR-G	●	●	●	●	●	General-purpose	1st Recommendation	1
170808PNSR-R	●	●	●	●	●	Heavy Cutting	Nicked	2

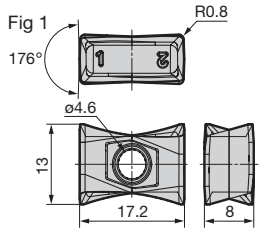
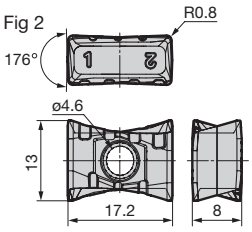
Fig 1


Fig 2


Parts

Flat Head Screw (For Inserts/Shims)		Wrench	Anti-seizure Cream	Shim (*)
BFTX0412IP	**3.0**	TTR15IP	SUMI-P	PWSS4R

* For cutters ø200mm or larger.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	150-**250**-350	0.10-**0.23**-0.35	ACP200
	Alloy Steel	180 to 280HB	100-**175**-250	0.10-**0.18**-0.25	ACP200
M	Stainless Steel	—	100-**150**-200	0.10-**0.18**-0.25	ACP300
K	Cast Iron Ductile Cast Iron	250HB	100-**175**-250	0.10-**0.23**-0.35	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

PWSR 4000 type

P Steel M Stainless Steel K Cast Iron

Rake Angle	Radial	-15°
	Axial	-6°

31 mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

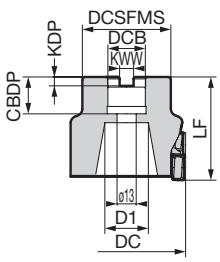


Fig 2

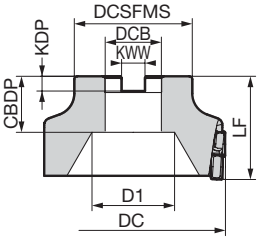


Fig 3

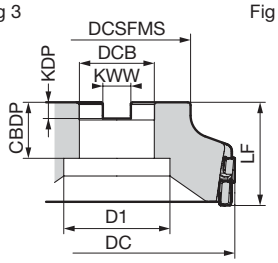
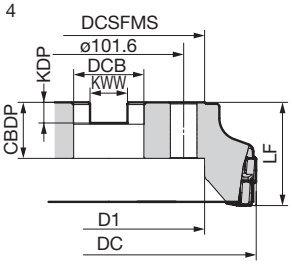


Fig 4



Body (2-Step type)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
Inch	**PWSR 4080R**		**80**	60	70	**25.4**	9.5	6	25	29.5	8	2	4	1.4	1
	4100R		**100**	70	70	**31.75**	12.7	8	32	46	12	2	6	2.0	2
	4125R		**125**	80	70	**38.1**	15.9	10	38	56	12	2	6	3.0	2
	4160R		**160**	100	70	**50.8**	19.1	11	38	72	16	2	8	5.2	3
	4200R		**200**	130	70	**47.625**	25.4	14	38	160	20	2	10	8.0	4

Cutters ø200mm or larger do not have oil holes but come with shims.
Inserts are sold separately.

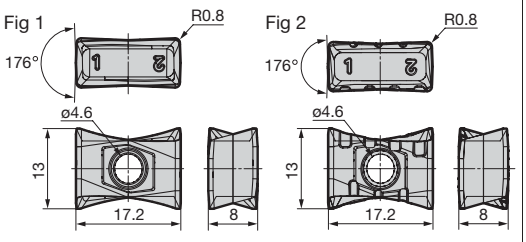
Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	P			K	
	General-purpose		PM	PM	K	
	Roughing		PM	PM		K

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	Applications	Remarks	Fig
LNMX 170808PNSR-L	●	●	●	●	●	Light Cutting		1
170808PNSR-G	●	●	●	●	●	General-purpose	1st Recommendation	1
170808PNSR-R	●	●	●	●	●	Heavy Cutting	Nicked	2



Parts

Flat Head Screw (For Inserts/Shims)		Wrench	Anti-seizure Cream	Shim (*)
BFTX0412IP	3.0	TTR15IP	SUMI-P	PWSS4R

* For cutters ø200mm or larger.

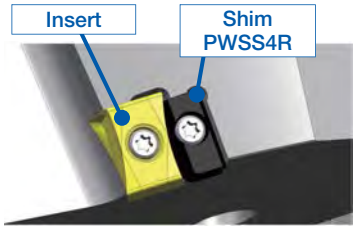
Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	150-**250**-350	0.10-**0.23**-0.35	ACP200
	Alloy Steel	180 to 280HB	100-**175**-250	0.10-**0.18**-0.25	ACP200
M	Stainless Steel	—	100-**150**-200	0.10-**0.18**-0.25	ACP300
K	Cast Iron Ductile Cast Iron	250HB	100-**175**-250	0.10-**0.23**-0.35	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Large Diameter Size (ø200mm or larger) Body Structure

Safety Shim Design to Protect Body



CHG 4000 type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal

Rake Angle		
	Radial	4°
	Axial	15°

16mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

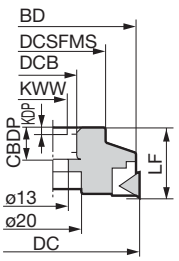


Fig 2

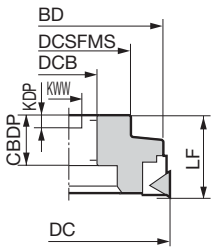


Fig 3

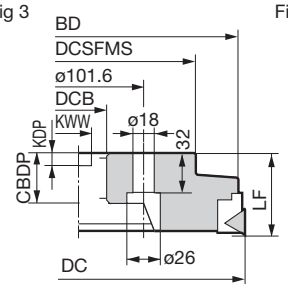
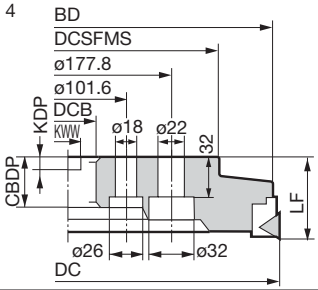


Fig 4



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**CHG 4080R**	●	**80**	78	60	50	**25.4**	9.5	6	25	4	1.3	1
	4100R	●	**100**	96	70	63	**31.75**	12.7	8	32	5	2.0	2
	4125R	●	**125**	120	80	63	**38.1**	15.9	10	38	6	3.1	2
	4160R	●	**160**	154	100	63	**50.8**	19.1	11	38	8	5.3	2
	4200R	●	**200**	193	130	63	**47.625**	25.4	13.5	38	10	8.1	3
	4250R		**250**	242	180	63	**47.625**	25.4	13.5	40	12	13.8	3
	4315R		**315**	307	240	63	**47.625**	25.4	13.5	40	14	21.9	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide			Cermet	SUMIDIA			
Process	High-speed/Light Cutting	P			K		M			K N		N	N	N	
	General-purpose		P M	P M	K			P	K		P	N	N	N	
	Roughing		P M	P M		K						N	N	N	
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E	H1	T250A	DA150	DA1000	DA2200	Fig
TEEN 43R*									●	●		●	—	—	1-A
NF-TEEN 43R		—	—	—	—	—	—	—	—	—	—	—	●	▲	1-A
TEEN 43TR		●	●	●				●			●	—	—	—	2(1)-B
TEKN 43R					●	●			●			—	—	—	2(1)-A
43TR		●	●	●				●			●	—	—	—	2(1)-B

Fig 1

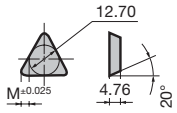
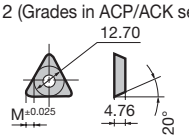


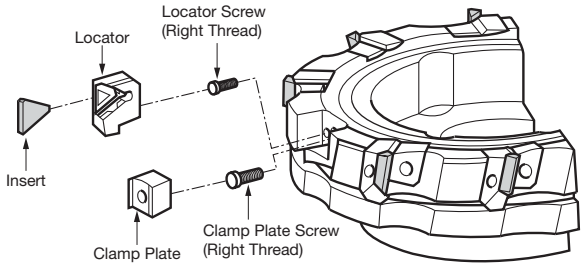
Fig 2 (Grades in ACP/ACK series)



Cutting Edge A

Cutting Edge B

DL1000 is also available for *-marked TEEN43R.
Top face and wiper edge of H1 insert have a mirror finish.
E class precision inserts have some difference in shape.



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	General Steel	180 to 280HB	80-**115**-150	0.10-**0.18**-0.25	ACP200
	Mild Steel	≤ 180HB	100-**125**-150	0.10-**0.15**-0.20	ACP200
	Die Steel	200 to 220HB	60- **80** -100	0.10-**0.15**-0.20	ACP200
M	Stainless Steel	—	80-**115**-150	0.05-**0.10**-0.15	ACP300
K	Cast Iron	250HB	60- **90** -120	0.10-**0.18**-0.25	ACK200
N	Non-Ferrous Metals	—	300-**650**-1,000	0.10-**0.20**-0.30	DA1000 H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Locator	Locator Screw	Size	N·m	Clamp Plate	Clamp Plate Screw	Size	N·m	Wrench
CHG 4080R to CHG 4125R	LCH4R	FBH0512	**M5**	**5.0**	CHWR	FBX0811	**M8**	**8.0**	TH030
CHG 4160R to CHG 4315R						FBX0817			TH040

The wrench for locator screw is TH030 and for clamp plate screw is TH040.

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SEC-Multi Use Endmill

CHE 2000 type

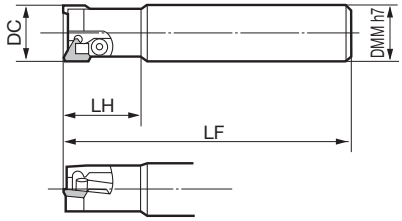
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal

Rake Angle	Radial	-3° to 0°
	Axial	6° to 15°

8mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Axial Rake	Radial Rake	Fig
CHE 2016R	●	**16**	16	25	100	1	+6°	-3°	1
2018R	●	**18**	20	30	110	1	+8°	-2°	1
2020R	●	**20**	20	30	110	2	+10°	-2°	1
2022R	●	**22**	20	30	110	2	+12°	-1°	1
2025R	●	**25**	25	35	120	2	+15°	-1°	1
2028R	●	**28**	25	35	120	2	+15°	0°	1

Inserts are sold separately.

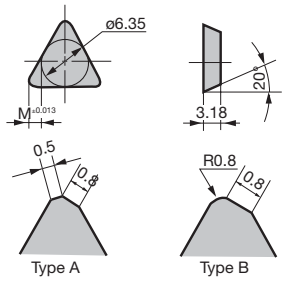
Insert

Dimensions (mm)

Grade Classification		Coated Carbide	Cemented Carbide			Cermet	SUMIDIA	
Process	High-speed/Light Cutting				K N		N	N
	General-purpose	P M	P	K		P	N	N
	Roughing	P M					N	N

Cat. No.	ACP200	A30N	G10E	H1	T250A	DA1000	DA2200	Cutting Edge Shape	Fig
TEEN 22R	—	—	—	—	—	—	—	A	1
NF-TEEN 22R	—	—	—	—	—	●	▲	A	1
TECN 22R			●	●		—	—	A	1
22TR		●				—	—	B	1
TEKN 22R			●			—	—	A	1
22TR		●			●	—	—	B	1

Fig 1



Parts

Clamp Plate	Bolt		Retaining Ring	Wrench
		N·m		
CCH4R	BHE0407	**1.8**	ER03	TH025

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	50- **75** -100	0.03-**0.06**-0.10	A30N
	Alloy Steel	180 to 280HB	50- **75** -80	0.03-**0.05**-0.06	A30N
K	Cast Iron	250HB	40- **70** -100	0.03-**0.10**-0.15	G10E
N	Non-Ferrous Metals	—	40- **90** -150	0.03-**0.10**-0.15	DA1000 H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

CHE 3000 type

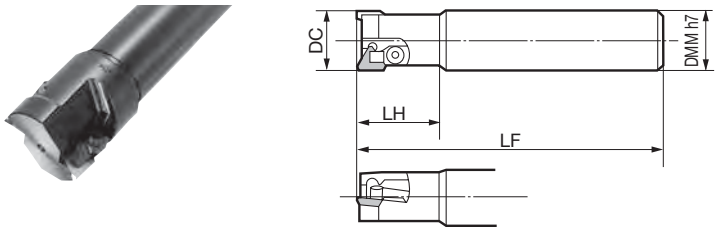
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal

Rake Angle	Radial	-3° to 0°
	Axial	15°

13mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Axial Rake	Radial Rake	Fig
CHE 3030R	●	**30**	32	45	160	2	+15°	-3°	1
3032R	●	**32**	32	45	160	2	+15°	-2°	1
3036R	●	**36**	32	45	160	2	+15°	-1°	1
3040R	●	**40**	32	45	160	2	+15°	0°	1

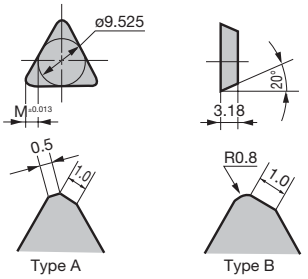
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide		Cemented Carbide			Cermet	SUMIDIA			
Process	High-speed/Light Cutting		K			K/N		N	N		
	General-purpose	P/M	K	P	K		P	N	N		
	Roughing	P/M						N	N		
Cat. No.		ACP200	ACK200	A30N	G10E	H1	T250A	DA1000	DA2200	Cutting Edge Shape	Fig
TEEN 32R		—	—	—	—	—	—	—	—	A	1
NF-TEEN 32R		—	—	—	—	—	—	●	▲	A	1
TECN 32R					●	●		—	—	A	1
32TR				●				—	—	B	1
TEKN 32R			●		●			—	—	A	1
32TR		●		●			●	—	—	B	1

Fig 1



Parts

Clamp Plate	Bolt		Retaining Ring	Wrench
		N·m		
CCH5R	BHE0510	**2.7**	ER04	LH030

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	60- **90** -120	0.04- **0.08** -0.15	ACP200
P	Alloy Steel	180 to 280HB	60- **80** -100	0.04- **0.08** -0.13	ACP200
K	Cast Iron	250HB	60- **90** -120	0.04- **0.12** -0.20	ACK200
N	Non-Ferrous Metals	—	60- **130** -200	0.04- **0.12** -0.20	DA1000 H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SEC-Multi Use Endmill

CHE 4000 type

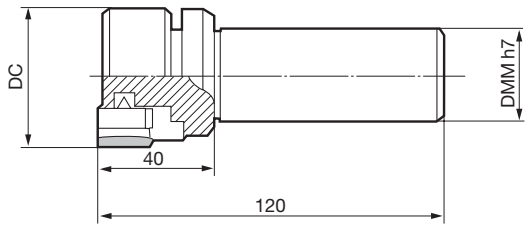
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal

Rake Angle	Radial	2° to 4°
	Axial	15°

16mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Number of Teeth	Axial Rake	Radial Rake	Approach Angle	Fig
CHE 4050R	●	**50**	32	3	+15°	+2°	0°	1
4063R	●	**63**	32	4	+15°	+3°	0°	1
4080R	●	**80**	32	4	+15°	+4°	0°	1
4080RS42		**80**	42	4	+15°	+4°	0°	1
4100R		**100**	32	5	+15°	+4°	0°	1
4100RS42		**100**	42	5	+15°	+4°	0°	1

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide			Cermet	SUMIDIA			
Process	High-speed/Light Cutting	P			K		M			K/N		N	N	N	
	General-purpose		P/M	P/M	K			P	K		P	N	N	N	
	Roughing		P/M	P/M		K						N	N	N	
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E	H1	T250A	DA150	DA1000	DA2200	Fig
TEEN 43R*									●	●		●	—	—	1-A
NF-TEEN 43R		—	—	—	—	—	—	—	—	—	—	—	●	▲	1-A
TEEN 43TR		●	●	●				●			●	—	—	—	2(1)-B
TEKN 43R					●	●			●			—	—	—	2(1)-A
43TR		●	●	●				●			●	—	—	—	2(1)-B

Fig 1

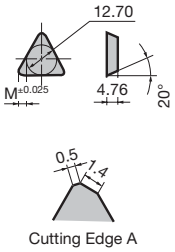
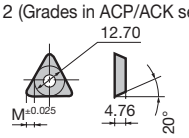


Fig 2 (Grades in ACP/ACK series)



DL1000 is also available for *-marked TEEN43R.
Top face and wiper edge of H1 insert have a mirror finish.
E class precision inserts have some difference in shape.

Parts

Applicable Cutter	Locator	Locator Screw	Size	N·m	Clamp Plate	Clamp Plate Screw	Size	N·m	Wrench
CHE4050R CHE4063R	LCE4R	FBH0512	**M5**	5.0	CEWR	WB8R-16T	**M8**	8.0	TT27

Parts

Applicable Cutter	Locator	Locator Screw	Size	N·m	Clamp Plate	Clamp Plate Screw	Size	N·m	Wrench
CHE4080R CHE4100R CHE4080RS42 CHE4100RS42	LCH4R	FBH0512	**M5**	5.0	CHWR	FBX0811	**M8**	5.0	TH040

* The above includes a TH030 wrench for locator screw.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	125-**100**-150	0.10-**0.15**-0.20	ACP200
P	Alloy Steel	180 to 280HB	80-**100**-120	0.10-**0.20**-0.30	ACP200
K	Cast Iron	250HB	80-**100**-120	0.10-**0.20**-0.30	ACK200
N	Non-Ferrous Metals	—	60-**130**-200	0.05-**0.20**-0.30	DA1000 H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

CPG 4000 type

P Steel M Stainless Steel K Cast Iron

Rake Angle		
	Radial	0°
	Axial	6°

18mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1

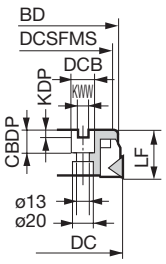


Fig 2

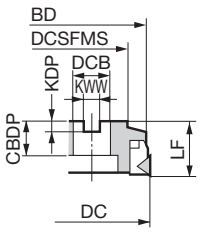


Fig 3

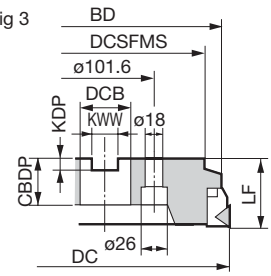


Figure shows right-handed (R) tool.

Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**CPG 4080R/L**	●		**'80**	77	60	50	**25.4**	9.5	6	25	5	1.2	1
	4100R/L	●		**100**	97	75	60	**31.75**	12.7	8	32	6	2.0	2
	4125R/L	●		**125**	121	75	60	**38.1**	15.9	10	38	8	3.3	2
	4160R/L	●		**160**	155	100	60	**50.8**	19.1	11	38	10	5.5	2
	4200R/L	●		**200**	194	130	60	**47.625**	25.4	13.5	38	12	8.6	3
	4250R/L			**250**	243	200	70	**47.625**	25.4	13.5	52	14	17.9	3
	4315R/L			**315**	308	240	70	**47.625**	25.4	13.5	52	18	25.5	3

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide						Cemented Carbide				Cermet			
Process	High-speed/Light Cutting	P			K		M					P	P		
	General-purpose		PM	PM	K			P	P	K	K			P	
	Roughing		PM	PM		K									
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30	A30N	H10E	G10E	T1500A	T130A	T250A	Fig
TPCH 43R					●	●	●				●				1(2)
43L											●				2
43TR		●	●	●					●	●		●		●	1(2)
43TL									●						2
TPMN 432								●			●	●	●		3
433								●			●				3

Fig 1 (Grades in ACP/ACK series)

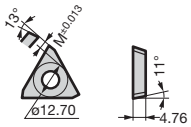
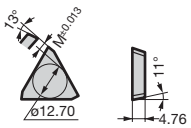
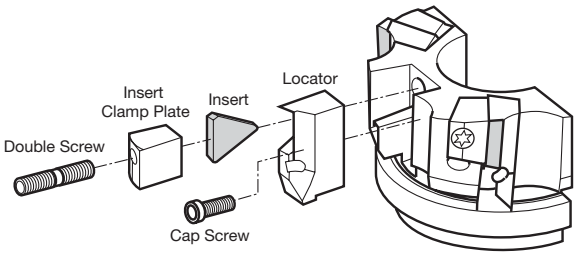


Fig 2



(Close-up of Cutting Edge for Figures 1 & 2)

Fig 3



Parts

Applicable Cutter	Locator	Cap Screw	Clamp Plate	Double Screw	Wrench
CPG4080R	LCP40R	BX0508	PTW40R	WB8-22T	TT27 LH040
CPG4100R Up to CPG4125R	LCP40R	BX0510	PTW41R	WB8-22T	TT27 LH040
CPG4160R Up to CPG4315R	LCP40R	BX0510	PTW41R	WB8-30T	TT27 LH040
CPG4080L	LCP40L	BX0508	PTW40L	WB8-22T	TT27 LH040
CPG4100L Up to CPG4125L	LCP40L	BX0510	PTW41L	WB8-22T	TT27 LH040
CPG4160L Up to CPG4315L	LCP40L	BX0510	PTW41L	WB8-30T	TT27 LH040

Of the wrenches, TT27 is for double screw while LH040 is for cap screw.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	General Steel	180 to 280HB	80-**110**-140	0.10-**0.18**-0.25	ACP200
P	Mild Steel	≤ 180HB	100-**125**-150	0.10-**0.15**-0.20	ACP200
P	Die Steel	200 to 220HB	60- **80** -100	0.10-**0.15**-0.20	ACP200
M	Stainless Steel	—	100-**125**-150	0.10-**0.18**-0.25	ACP300
K	Cast Iron	250HB	60- **90** -120	0.10-**0.18**-0.25	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

FMS series

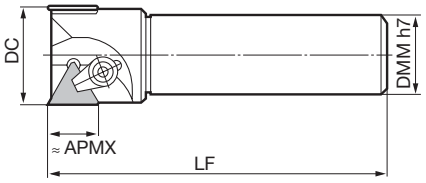
P Steel | M Stainless Steel | K Cast Iron

Rake Angle	Radial	-4° to -6°
	Axial	3° to 7°

8 to 19 mm | 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Overall Length LF	Number of Teeth	Axial Rake	Radial Rake	Fig
FMS 216	●	**16**	8	16	70	1	+3°	-6°	1
220	●	**20**	8	20	100	2	+3°	-4°	1
225	●	**25**	8	25	110	2	+7°	-4°	1
FMS 330	●	**30**	13	32	160	2	+7°	-4°	1
332	●	**32**	13	32	160	2	+7°	-4°	1
335	●	**35**	13	32	160	2	+7°	-4°	1
FMS 440	●	**40**	19	32	160	2	+7°	-4°	1
450	●	**50**	19	32	160	2	+7°	-4°	1
460	●	**60**	19	32	160	3	+7°	-4°	1
440B		**40**	19	42	160	2	+7°	-4°	1

Inserts are sold separately.

Insert

Common to Figs. 1 to 3

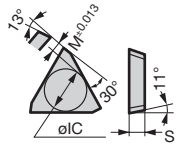
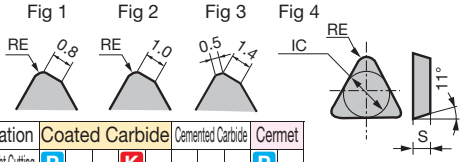


Fig 1 Fig 2 Fig 3 Fig 4



Grade Classification		Coated Carbide					Cemented Carbide			Cermet							
Process	High-speed/Light Cutting	P			K					P							
	General-purpose		P M	P M	K		P		K		P						
	Roughing		P M	P M		K											

Dimensions (mm)

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	A30N	A30	G10E	T1500A	T250A	Inscribed Circle IC	Thickness S	Corner Radius RE	Fig	Applicable Cutter
TPKN 22TR						●				●	6.35	3.18	0.8	1	FMS
22R								●			6.35	3.18	0.8	1	216 to
TPMN 222							●	●			6.35	3.18	0.8	4	FMS 225
TPKN 32TR						●				●	9.525	3.18	0.8	2	FMS
32R								●			9.525	3.18	0.8	2	330 to
TPMN 322							●	●	●		9.525	3.18	0.8	4	FMS 335
TPCH 43TR	●	●	●			●			●	●	12.70	4.76	—	3	FMS
43R				●	●			●			12.70	4.76	—	3	440(B)
TPMN 432							●	●	●		12.70	4.76	0.8	4	to FMS
433							●	●			12.70	4.76	1.2	4	460

H10E is also in stock for TPCH43TR.
EH20Z is also in stock for TPCH43R.

Recommended Cutting Conditions

Diameter ø16 to ø25mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	50- **75** -100	0.03-**0.06**-0.10	ACP200
	Alloy Steel	180 to 280HB	50- **65** -80	0.03-**0.05**-0.08	ACP200
K	Cast Iron	250HB	40- **70** -100	0.03-**0.10**-0.15	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Diameter ø30 to ø35mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	60- **90** -120	0.04-**0.08**-0.15	ACP200
	Alloy Steel	180 to 280HB	60- **80** -100	0.04-**0.08**-0.13	ACP200
K	Cast Iron	250HB	60- **90** -120	0.04-**0.12**-0.20	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Diameter ø40 to ø60mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	60-**100**-150	0.05-**0.15**-0.20	ACP200
	Alloy Steel	180 to 280HB	60- **90** -120	0.05-**0.12**-0.18	ACP200
K	Cast Iron	250HB	60- **90** -120	0.05-**0.15**-0.25	ACK200

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Parts

Applicable Cutter	Clamp Plate	Double Screw			Shim	Spring Pin	Wrench
			Size	N·m			
FMS216 / FMS220	CCM5BSL	WB5-10	**M5**	5.0	—	—	TH025
FMS225	CCM5BSL	WB5-12	**M5**	5.0	—	—	TH025
FMS330 to FMS335	CCM6BL	WB6-16	**M6**	5.0	—	—	LH030
FMS440(B) to FMS460	CCM8UL	WB8-20	**M8**	8.0	STPL42	SPP308	LH040

N·m Recommended Tightening Torque (N·m)

DMSL/DMSW series

VIDEO OF CUTTING

New

■ Features

- Complex arc-shaped cutting edge achieves a smaller cutting angle and a larger depth of cut simultaneously
  High-efficiency machining at maximum feed rate per tooth of 3.5mm/t is possible
- Small cutting angle controls cutting force toward the back force direction
  Stable machining without chatter even with long tool overhang amount

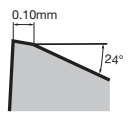
■ Product Range

Type	Cat. No.	Max. Diameter (mm)																			
		ø16	ø18	ø20	ø22	ø25	ø26	ø28	ø30	ø32	ø35	ø40	ø42	ø50	ø52	ø63	ø66	ø80	ø85	ø100	ø125	ø160
Shell	DMSL 06000RS											5 6		5 8	8	8	8	9				
Shell	DMSL 06000R (Inch)													5 8		8						
Shell	DMSW 08000RS													4 5	4 5	4 5* 6*	5 6	6 8	6 8	6	8	10
Shell	DMSW 08000R (Inch)													4 5		4 5 6		6 8		6	8	10
Shank	DMSL 06000E	2	2	3 4	3 4	4 5		4 5	5	5 6	5	6										
Shank	DMSL 06000EL	2	2	3	3	4		4	5	5	5	6										
Shank	DMSW 08000E										2	3		3		4						
Shank	DMSW 08000EL										2	3		3		4						
Modular	DMSL 06000M	2	2	3 4	3 4	4 5	4	4 5	5	5 6	5	6	6									
Modular	DMSW 08000M										2	3	3									

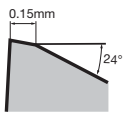
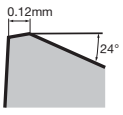
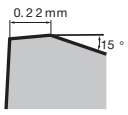
Number in ●●● shows the number of teeth (Inch) Inch Bore * mark: Different-diameter mounting sizes in stock

Modular type ☞H267

■ Chipbreaker (DMSL type)

Work Material	P M K S H
	G type
Chipbreaker	
Cutting Edge Cross Section	

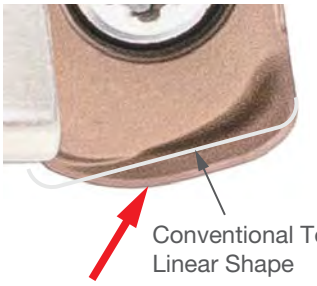
■ Chipbreaker (DMSW type)

Work Material	P M K S		P M K H
	L type	G type	H type
Chipbreaker			
Cutting Edge Cross Section			

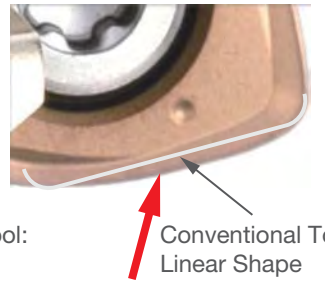
DMSL/DMSW series

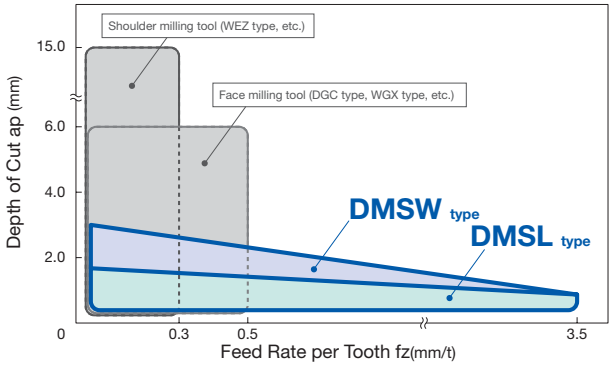
● Complex arc-shaped cutting edge achieves a smaller cutting angle and a larger depth of cut simultaneously. High-efficiency machining at maximum feed rate per tooth of 3.5mm/t is possible.

DMSL type



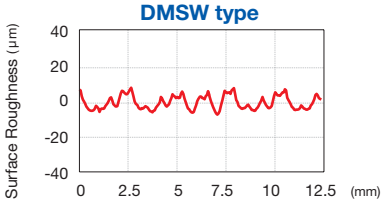
DMSW type





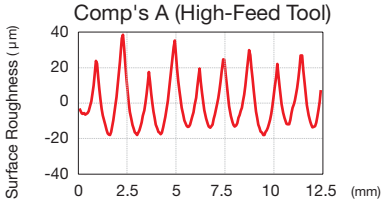
● Even at high feed rates of 2.0mm/t or more, a reasonable surface finish can be attained without a wiper insert.

DMSW type



Ra 3.3μm Rz 14.1μm

Comp's A (High-Feed Tool)



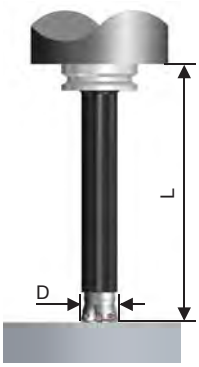
Ra 11.2μm Rz 51.0μm

Machine: Vertical Machining Centre BT50, Work Material: S50C Insert: WNMU0807ZNER-G (ACU2500)
Tool: DMSW 08063RS04 (ø63, 4-tooth) Cutting Conditions: vc = 150m/min, fz = 2.5mm/t, ap = 0.5mm, ae = 40mm Dry

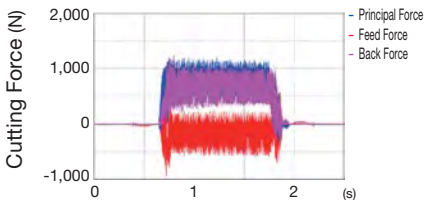
● Small cutting angle controls cutting force toward the back force direction
Suppresses chatter in long tool overhang machining, increasing efficiency

DMSL type/DMSW type

(Reference) Shoulder Milling Tool

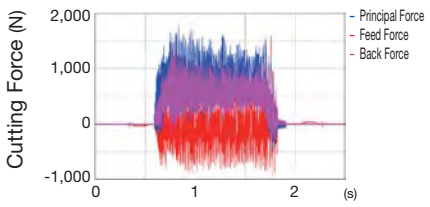


DMSL type



No Chattering

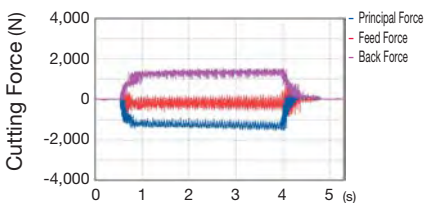
Comp's B (High-Feed Tool)



Heavy Chattering

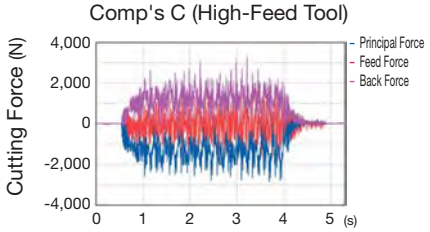
Machine: Vertical Machining Centre BT50, Work Material: S50C
Tool: DMSL06020E03 (D = ø20, 3 teeth)
Insert: LNMU06T3ZNER-G (ACU2500)
Cutting Conditions: vc = 160m/min, fz = 0.60mm/t, ap = 0.8mm, ae = 20mm, L = 100mm, Dry

DMSW type



No Chattering

Comp's C (High-Feed Tool)



Heavy Chattering

Machine: Vertical Machining Centre BT50, Work Material: S50C
Tool: DMSW08050RS04 (D = ø50, 4 teeth)
Insert: WNMU0807ZNER-G (ACU2500)
Cutting Conditions: vc = 160m/min, fz = 0.65mm/t, ap = 0.8mm, ae = 45mm, L = 340mm, Dry

DMSL/DMSW series

■ Precautions for Corner Finishing

* Corners will have unmachined surfaces or gouges with respect to the expected corner profile.

Fig 1

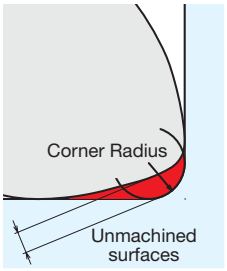
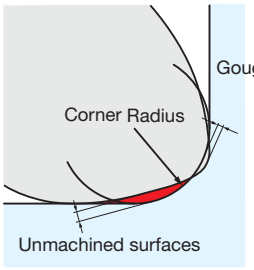


Fig 2



DMSL type			
Corner Radius	Unmachined surfaces	Gouging	Fig
0.5	0.88	0	1
1.0	0.69	0	1
1.5	0.54	0	1
2.0	0.41	0.02	2

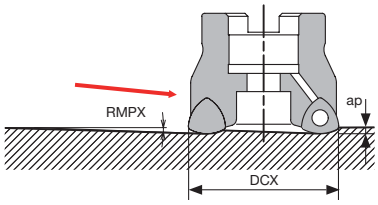
(mm)

DMSW type			
Corner Radius	Unmachined surfaces	Gouging	Fig
2.0	1.22	0	1
2.5	1.08	0	1
3.0	0.95	0	1
3.5	0.83	0.04	2

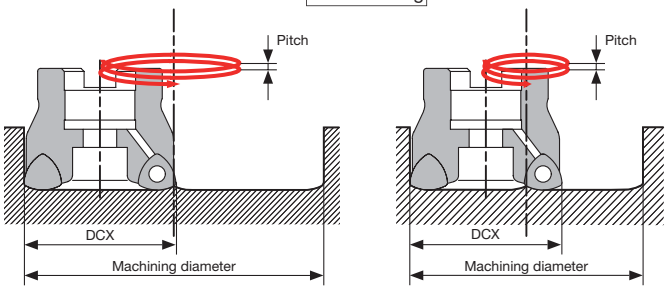
(mm)

■ Ramping/Helical Milling Upper Limit

Ramping



Helical Milling



Precautions for Helical Milling

- Above the max. machining diameter, the centre uncut portion can be removed by traverse cutting with the same cutter.
- Below the min. machining diameter, the centre uncut portion cannot be removed with the same cutter.

	Max. Dia. DCX (mm)	Ramping	Helical Milling					
		Max. Ramping Angle RMPX (°)	Max. Machining Dia. (mm)	Max. Pitch (mm/rev)	Standard Diameter (mm)	Max. Pitch (mm/rev)	Min. Machining Dia. (mm)	Max. Pitch (mm/rev)
DMSL type	**16**	0.6	31.3	0.6	24.4	0.3	23.8	0.25
	18	0.8	35.3	0.8	28.3	0.4	27.2	0.3
	20	1.0	39.3	1.0	32.3	0.6	30.5	0.3
	22	1.0	43.3	1.0	36.3	0.7	34.3	0.3
	25	1.0	49.3	1.0	42.3	0.9	39.9	0.3
	26	1.0	51.3	1.0	44.3	0.9	41.8	0.3
	28	0.9	55.3	1.0	48.2	0.9	45.7	0.3
	30	0.8	59.3	1.0	52.2	1.0	49.6	0.3
	32	0.7	63.3	1.0	56.2	1.0	53.6	0.3
	35	0.6	69.3	1.0	62.2	1.0	59.5	0.3
	40	0.5	79.3	1.0	72.2	1.0	69.6	0.3
	42	0.5	83.3	1.0	76.2	1.0	73.5	0.3
	50	Not recommended						
	52	Not recommended						
	63	Not recommended						
	66	Not recommended						
	80	Not recommended						

	Max. Dia. DCX (mm)	Ramping	Helical Milling					
		Max. Ramping Angle RMPX (°)	Max. Machining Dia. (mm)	Max. Pitch (mm/rev)	Standard Diameter (mm)	Max. Pitch (mm/rev)	Min. Machining Dia. (mm)	Max. Pitch (mm/rev)
DMSW type	**35**	0.5	69.3	1.3	53.5	0.5	52.0	0.5
	40	0.8	79.3	2.0	63.4	1.0	60.2	0.5
	42	0.8	83.3	2.0	67.4	1.0	63.9	0.5
	50	1.4	99.3	2.0	83.3	2.0	79.1	1.0
	52	1.4	103.3	2.0	87.3	2.0	82.8	1.0
	63	1.2	125.3	2.0	109.3	2.0	103.6	1.0
	66	1.2	131.3	2.0	115.3	2.0	109.4	1.0
	80	1.2	159.3	2.0	143.2	2.0	134.0	1.0
	85	1.2	169.3	2.0	153.2	2.0	144.0	1.0
	100	0.8	199.3	2.0	183.2	2.0	174.0	1.0
	125	Not recommended						
	160	Not recommended						

MEMO

DMSL 06000R(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy | H Hardened Steel

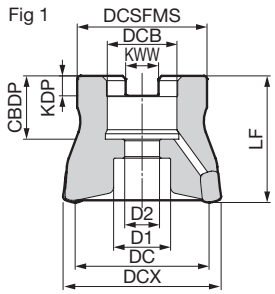
New

Rake Angle	Radial	-8° to -12.5°
	Axial	-8°

1.5mm 17°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**DMSL 06040RS05**	●	**40**	32.3	33	40	**16**	8.4	5.6	18	14	9	5	0.20	1
	06040RS06	●	**40**	32.3	33	40	**16**	8.4	5.6	18	14	9	6	0.20	1
	06042RS06		**42**	34.3	33	40	**16**	8.4	5.6	18	14	9	6	0.21	1
	06050RS05	●	**50**	42.3	41	40	**22**	10.4	6.3	20	18	11	5	0.31	1
	06050RS08	●	**50**	42.3	41	40	**22**	10.4	6.3	20	18	11	8	0.30	1
	06052RS08		**52**	44.3	41	40	**22**	10.4	6.3	20	18	11	8	0.31	1
	06063RS08		**63**	55.3	50	40	**22**	10.4	6.3	20	18	11	8	0.52	1
	06066RS08-27		**66**	58.3	55	50	**27**	12.4	7	22	20	14	8	0.69	1
	06080RS09		***80**	72.3	55	50	**27**	12.4	7	22	20	14	9	0.94	1
Inch	**DMSL 06050R05**	●	**50**	42.3	41	40	**22.225**	8.4	5	20	18	11	5	0.32	1
	06050R08	●	**50**	42.3	41	40	**22.225**	8.4	5	20	18	11	8	0.30	1
	06063R08		**63**	55.3	50	40	**22.225**	8.4	5	20	18	11	8	0.53	1

Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Parts

Flat Insert Screw		Integrated Wrench	Anti-seizure Cream
	N·m		
BFTX02507IP	2.0	TRDR08IP	SUMI-P

Identification Code

DMSL Series Code | **06** Insert Size | **066** Max. Dia. | **R** Feed Direction | **S** Metric Bore | **08-27** Number of Teeth / Mounting Size

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DMSL 06000R(S) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy H Hardened Steel

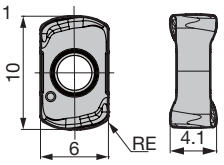
New

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										
Process	High-speed/Light Cutting		P M	P		K		M S				
	General-purpose	P M S	P M	P	P	K	K	M S	M S	M S		
	Roughing	P M S			P		K		M S	M S		
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	ACK2000	ACK3000	XCS2000	ACS2500	ACS3000	Corner Radius RE	Fig
LNMU 06T3ZNER-G		●	●	●	●	●	●	●	●	●	1.0	1

Fig 1



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	General Steel	Below 280HB	100 - **160** - 250	1.0 - **1.5** - 2.0	ACU2500/ACP2000/ACP3000
P	Alloy Steel	Below 280HB	100 - **160** - 200	1.0 - **1.5** - 1.8	ACU2500/ACP2000/ACP3000
P	Alloy Steel	Below 42HRC	100 - **150** - 180	0.8 - **1.0** - 1.2	ACU2500/ACP2000/ACP3000
M	Stainless Steel	—	80 - **120** - 150	0.8 - **1.0** - 1.2	ACU2500/ACS2500/ACS3000
K	Cast Iron	—	100 - **160** - 250	1.0 - **1.5** - 1.8	ACU2500/ACK2000/ACK3000
S	Heat-Resistant Alloy	—	20 - **30** - 40	0.3 - **0.5** - 0.7	ACU2500/ACS2500/ACS3000
S	Ti Alloy	—	30 - **50** - 70	0.4 - **0.6** - 0.8	ACU2500/ACS2500/ACS3000
H	Hardened Steel	Below 52HRC	80 - **100** - 120	0.3 - **0.5** - 0.7	ACU2500/ACP3000

Note
- The above figures are guidelines for use with BT50 machine tools at depth of cut (ap) of 0.75mm.
- The above recommended cutting conditions may require adjustment depending on machine rigidity and work rigidity.

DMSW 08000R(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy | H Hardened Steel

Rake Angle		
	Radial	-7° to -10°
	Axial	-6°

3mm 15°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1

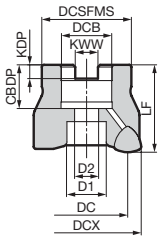


Fig 2

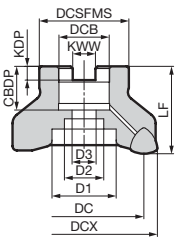


Fig 3

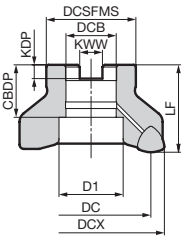


Fig 4

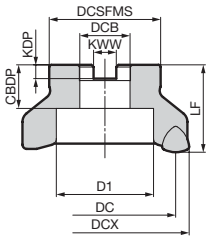
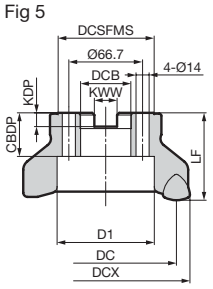


Fig 5



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Bolt D3	Number of Teeth	Weight (kg)	Fig
Metric	**DMSW 08050RS04**	●	**50**	33.4	41	40	**22**	10.4	6.3	20	16.7	11	—	4	0.25	1
	08050RS05	●	**50**	33.4	41	40	**22**	10.4	6.3	20	16.7	11	—	5	0.24	1
	08052RS04		**52**	35.4	41	40	**22**	10.4	6.3	20	16.7	11	—	4	0.27	1
	08052RS05		**52**	35.4	41	40	**22**	10.4	6.3	20	16.7	11	—	5	0.25	1
	08063RS04	●	**63**	46.4	50	40	**22**	10.4	6.3	20	18	11	—	4	0.46	1
	08063RS05	●	**63**	46.4	50	40	**22**	10.4	6.3	20	18	11	—	5	0.46	1
	08063RS06	●	**63**	46.4	50	40	**22**	10.4	6.3	20	18	11	—	6	0.44	1
	08063RS05-27	●	**63**	46.4	50	50	**27**	12.4	7	22	20	14	—	5	0.55	1
	08063RS06-27	●	**63**	46.4	50	50	**27**	12.4	7	22	20	14	—	6	0.53	1
	08066RS05-27		**66**	49.4	50	50	**27**	12.4	7	22	20	14	—	5	0.60	1
	08066RS06-27		**66**	49.4	50	50	**27**	12.4	7	22	20	14	—	6	0.58	1
	08080RS06	●	***80**	63.3	55	50	**27**	12.4	7	22	20	14	—	6	0.88	1
	08080RS08	●	***80**	63.3	55	50	**27**	12.4	7	22	20	14	—	8	0.84	1
	08085RS06		***85**	68.3	55	50	**27**	12.4	7	22	20	14	—	6	1.01	1
	08085RS08		***85**	68.3	55	50	**27**	12.4	7	22	20	14	—	8	0.99	1
	08100RS06	●	**100**	83.3	70	50	**32**	14.4	8	32	46	—	—	6	1.29	3
	08125RS08	●	**125**	108.3	80	63	**40**	16.4	9	29	52	29	—	8	2.41	1
	08160RS10	●	**160**	143.3	100	63	**40**	16.4	9	29	90	—	—	10	4.73	5
Inch	**DMSW 08050R04**	●	**50**	33.4	41	40	**22.225**	8.4	5	20	16.7	11	—	4	0.25	1
	08050R05	●	**50**	33.4	41	40	**22.225**	8.4	5	20	16.7	11	—	5	0.24	1
	08063R04	●	**63**	46.4	50	40	**22.225**	8.4	5	20	18	11	—	4	0.46	1
	08063R05	●	**63**	46.4	50	40	**22.225**	8.4	5	20	18	11	—	5	0.46	1
	08063R06	●	**63**	46.4	50	40	**22.225**	8.4	5	20	18	11	—	6	0.44	1
	08080R06	●	***80**	63.3	70	63	**31.75**	12.7	8	32	27	18	—	6	1.32	1
	08080R08	●	***80**	63.3	70	63	**31.75**	12.7	8	32	27	18	—	8	1.28	1
	08100R06	●	***100**	83.3	70	63	**31.75**	12.7	8	32	46	27	18	6	1.75	2
	08125R08	●	**125**	108.3	80	63	**38.1**	15.9	10	35.5	55	30	—	8	2.55	1
	08160R10	●	**160**	143.3	100	63	**50.8**	19.1	11	38	72	—	—	10	4.18	4

Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hexagonal socket bolt (metric specification: M12 x 30 to 35mm, inch specification: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Parts

Applicable Cutter	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seizure Cream
				Handle Grip	Bit	
		N·m				
DMSW08160R(S)10	BFTX0513IP	5.0	TRDR20IP	—	—	SUMI-P
Other than above			—	HPL2025	TRB20IP	

Identification Code

DMSW 08 063 R S 05 - 27

Series Code	Insert Size	Max. Dia.	Feed Direction	Metric Bore	Number of Teeth	Mounting Size

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DMSW 08000R(S) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy H Hardened Steel

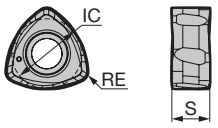
Expansion

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting		PKM	P		K		MS					
	General-purpose	PMS	PKM	P	P	K	K	MS	MS	MS			
	Roughing	PMS			P		K		MS	MS			
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	ACK2000	ACK3000	XCS2000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Corner Radius RE	Fig
WNMU 0807ZNER-L New		●		●	●			●	●	●	13	7	1.6	1
WNMU 0807ZNER-G		●	●	●	●	●	●	●	●	●	13	7	1.6	1
WNMU 0807ZNER-H New		●		●	●			●	●	●	13	7	1.6	1

Fig 1



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	General Steel	Below 280HB	100 - **160** - 250	1.0 - **1.5** - 2.0	ACU2500/ACP2000/ACP3000
	Alloy Steel	Below 280HB	100 - **160** - 200	1.0 - **1.5** - 1.8	
	Alloy Steel	Below 42HRC	100 - **150** - 180	0.8 - **1.0** - 1.2	
M	Stainless Steel	—	80 - **120** - 150	0.8 - **1.0** - 1.2	ACU2500/ACS2500/ACS3000
K	Cast Iron	—	100 - **160** - 250	1.0 - **1.5** - 1.8	ACU2500/ACK2000/ACK3000
S	Heat-Resistant Alloy	—	20 - **30** - 40	0.3 - **0.5** - 0.7	ACU2500/ACS2500/ACS3000
	Ti Alloy	—	30 - **50** - 70	0.4 - **0.6** - 0.8	
H	Hardened Steel	Below 52HRC	80 - **100** - 120	0.3 - **0.5** - 0.7	ACU2500/ACP3000

Note
- The above figures are guidelines for use with BT50 machine tools at depth of cut (ap) of 1.5mm.
- The above recommended cutting conditions may require adjustment depending on machine rigidity and work rigidity.

DMSL 06000E(L) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy | H Hardened Steel

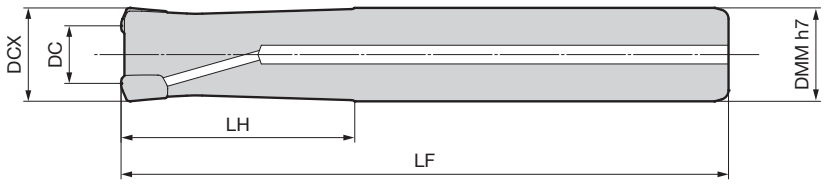
New

Rake Angle		
	Radial	-12.5° to -16.5°
	Axial	-8°

1.5mm 17°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
DMSL 06016E02	●	**16**	8.4	16	30	110	2	0.15	1
06018E02	●	**18**	10.4	16	30	110	2	0.15	1
06020E03	●	**20**	12.4	20	50	130	3	0.27	1
06020E04	●	**20**	12.4	20	50	130	4	0.27	1
06022E03	●	**22**	14.3	20	50	130	3	0.29	1
06022E04	●	**22**	14.3	20	50	130	4	0.29	1
06025E04	●	**25**	17.3	25	60	140	4	0.46	1
06025E05	●	**25**	17.3	25	60	140	5	0.46	1
06028E04	●	**28**	20.3	25	60	140	4	0.49	1
06028E05	●	**28**	20.3	25	60	140	5	0.48	1
06030E05	●	**30**	22.3	32	70	150	5	0.81	1
06032E05	●	**32**	24.3	32	70	150	5	0.82	1
06032E06	●	**32**	24.3	32	70	150	6	0.82	1
06035E05	●	**35**	27.3	32	50	150	5	0.88	1
06040E06		**40**	32.3	32	50	150	6	0.91	1

Body (Long Shank type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
DMSL 06016EL02	●	**16**	8.4	16	70	150	2	0.19	1
06018EL02	●	**18**	10.4	16	50	150	2	0.21	1
06020EL03	●	**20**	12.4	20	80	160	3	0.33	1
06022EL03	●	**22**	14.3	20	60	160	3	0.36	1
06025EL04	●	**25**	17.3	25	100	170	4	0.54	1
06028EL04	●	**28**	20.3	25	60	170	4	0.60	1
06030EL05	●	**30**	22.3	32	120	200	5	1.01	1
06032EL05	●	**32**	24.3	32	120	200	5	1.06	1
06035EL05	●	**35**	27.3	32	60	210	5	1.21	1
06040EL06		**40**	32.3	32	60	210	6	1.24	1

Parts

Flat Insert Screw		Integrated Wrench	Anti-seizure Cream
BFTX02507IP	2.0	TRDR08IP	SUMI-P

Identification Code

DMSL	06	025	E	L	04
Series Code	Insert Size	Max. Dia.	Shank type	Long Shank	Number of Teeth

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DMSL 06000E(L) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy H Hardened Steel

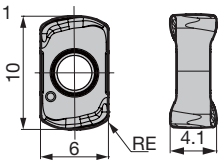
New

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										
Process	High-speed/Light Cutting		P M	P		K		M S				
	General-purpose	K P M S	P M	P	P	K	K	M S	M S	M S		
	Roughing	K P M S			P		K		M S	M S		
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	ACK2000	ACK3000	XCS2000	ACS2500	ACS3000	Corner Radius RE	Fig
LNMU 06T3ZNER-G		●	●	●	●	●	●	●	●	●	1.0	1

Fig 1



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	General Steel	Below 280HB	100 - **160** - 250	1.0 - **1.5** - 2.0	ACU2500/ACP2000/ACP3000
P	Alloy Steel	Below 280HB	100 - **160** - 200	1.0 - **1.5** - 1.8	ACU2500/ACP2000/ACP3000
P	Alloy Steel	Below 42HRC	100 - **150** - 180	0.8 - **1.0** - 1.2	ACU2500/ACP2000/ACP3000
M	Stainless Steel	—	80 - **120** - 150	0.8 - **1.0** - 1.2	ACU2500/ACS2500/ACS3000
K	Cast Iron	—	100 - **160** - 250	1.0 - **1.5** - 1.8	ACU2500/ACK2000/ACK3000
S	Heat-Resistant Alloy	—	20 - **30** - 40	0.3 - **0.5** - 0.7	ACU2500/ACS2500/ACS3000
S	Ti Alloy	—	30 - **50** - 70	0.4 - **0.6** - 0.8	ACU2500/ACS2500/ACS3000
H	Hardened Steel	Below 52HRC	80 - **100** - 120	0.3 - **0.5** - 0.7	ACU2500/ACP3000

Note
- The above figures are guidelines for use with BT50 machine tools at depth of cut (ap) of 0.75mm.
- The above recommended cutting conditions may require adjustment depending on machine rigidity and work rigidity.

DMSW 08000E(L) type

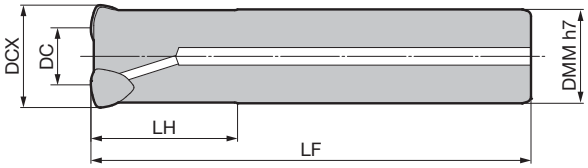
P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy | H Hardened Steel

Rake Angle		
	Radial	-10° to -13°
	Axial	-6°

3mm 15°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
DMSW 08035E02	●	**35**	18.6	32	50	150	2	0.85	1
08040E03	●	**40**	23.5	32	50	150	3	0.86	1
08050E03-42	●	**50**	33.4	42	50	150	3	1.51	1
08063E04-42		**63**	46.4	42	50	150	4	1.66	1

Inserts are sold separately.
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Body (Long Shank type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
DMSW 08035EL02	●	**35**	18.6	32	60	210	2	1.21	1
08040EL03	●	**40**	23.5	32	60	210	3	1.22	1
08050EL03-42	●	**50**	33.4	42	50	250	3	2.54	1
08063EL04-42		**63**	46.4	42	50	250	4	2.68	1

Inserts are sold separately.
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Parts

Flat Insert Screw		Integrated Wrench	Anti-seizure Cream
	N·m		
BFTX0513IP	**5.0**	TRDR20IP	SUMI-P

Identification Code

DMSW 08 050 E L 03 - 42

DMSW	08	050	E	L	03	42
Series Code	Insert Size	Max. Dia.	Shank type	Long Shank	Number of Teeth	Shank Dia.

N·m Recommended Tightening Torque (N·m)

DMSW 08000E(L) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy H Hardened Steel

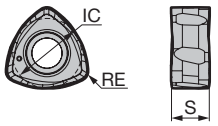
Expansion

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting		P K M	P		K		M S					
	General-purpose	P M K S	P K M	P	P	K	K	M S	M S	M S			
	Roughing	P M K S			P		K		M S	M S			
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	ACK2000	ACK3000	XCS2000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Corner Radius RE	Fig
WNMU 0807ZNER-L	New	●		●	●			●	●	●	13	7	1.6	1
WNMU 0807ZNER-G		●	●	●	●	●	●	●	●	●	13	7	1.6	1
WNMU 0807ZNER-H	New	●		●	●			●	●	●	13	7	1.6	1

Fig 1



Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	General Steel	Below 280HB	100 - **160** - 250	1.0 - **1.5** - 2.0	ACU2500/ACP2000/ACP3000
	Alloy Steel	Below 280HB	100 - **160** - 200	1.0 - **1.5** - 1.8	
	Alloy Steel	Below 42HRC	100 - **150** - 180	0.8 - **1.0** - 1.2	
M	Stainless Steel	—	80 - **120** - 150	0.8 - **1.0** - 1.2	ACU2500/ACS2500/ACS3000
K	Cast Iron	—	100 - **160** - 250	1.0 - **1.5** - 1.8	ACU2500/ACK2000/ACK3000
S	Heat-Resistant Alloy	—	20 - **30** - 40	0.3 - **0.5** - 0.7	ACU2500/ACS2500/ACS3000
	Ti Alloy	—	30 - **50** - 70	0.4 - **0.6** - 0.8	
H	Hardened Steel	Below 52HRC	80 - **100** - 120	0.3 - **0.5** - 0.7	ACU2500/ACP3000

Note
- The above figures are guidelines for use with BT50 machine tools at depth of cut (ap) of 1.5mm.
- The above recommended cutting conditions may require adjustment depending on machine rigidity and work rigidity.

WFXH series

VIDEO OF CUTTING

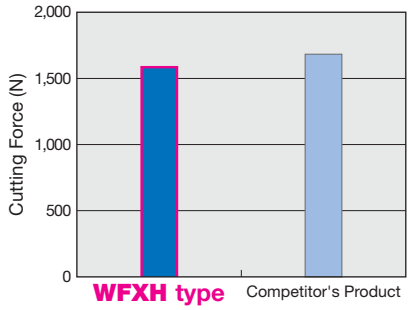
■ Features

SEC-WaveMill WFXH types are high performance multi-functional cutters that use WFX series inserts to support roughing at high feed rates and other milling applications.

(1) Stable, high-efficiency machining due to their superior sharpness
(2) Various milling applications are supported (ramping, helical milling)
(3) Various inserts for the WFX series can be used
(4) Applicable to various work materials
In addition to the general-purpose grade ACU2500, applicable to various work materials, the new-generation coated carbide grades XCU2500/XCK2000 are applicable to a wide variety of machining

Modular type ☞H269

Cutting force: High sharpness realises stable cutting



Work Material : S50C
Tool : WFXH12063RS (5 fluted)
Cutting Conditions : vc = 200m/min, fz = 1.0mm/t, ap = 0.5mm, ae = 44mm, Dry

Chips: Small and curled, low cutting temperatures

WFXH type (R1.6-G type Chipbreaker)

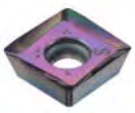
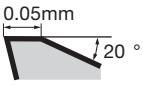
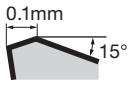
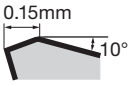
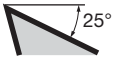
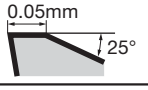
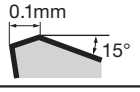
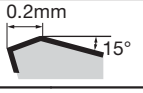
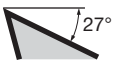
WFXH type

Competitor's Product A

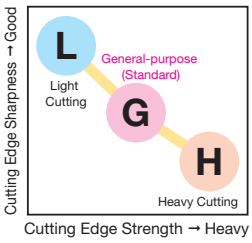
Competitor's Product B

Work Material : S50C
Tool : WFXH12063RS, SOMT120416PDER-G (ACP200)
Cutting Conditions: vc = 200m/min, fz = 1.0mm/t, ap = 1mm, ae = 35mm, Dry

■ Chipbreaker Selection

Work Material	P M K S			N
Applications	Light Cutting, Low Rigidity Milling and Reduction of Burrs	Main Chipbreaker General-purpose to Interrupted Milling	Roughing, Heavy Interrupted Cutting and Hardened Steel Milling	For Non-Ferrous Metals
Features	Low Cutting Force	General-purpose type	High Strength type	Sharp Edge
	L type	**G type**	**H type**	**S type**
Chipbreaker				
08 Series Cross Section				
12 Series Cross Section				

■ Chipbreaker Selection Guide



■ Precautions for Use (1) Precautions for corner milling

* Corners will have unmachined surfaces or gouges with respect to the expected corner profile.

Fig 1

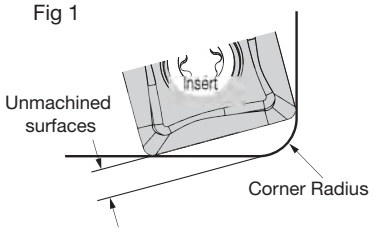
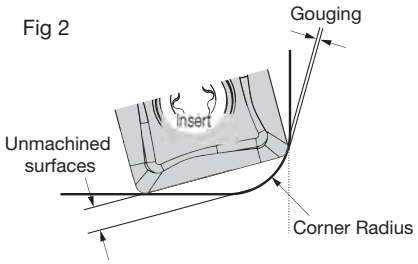


Fig 2



WFXH08000RS type

Dimensions (mm)

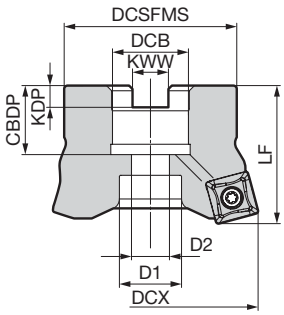
Corner Radius	SOMT08○○04-□ (RE0.4)			SOMT08○○08-□ (RE0.8)			SOMT08○○12-□ (RE1.2)		
	Unmachined surfaces	Gouging	Fig	Unmachined surfaces	Gouging	Fig	Unmachined surfaces	Gouging	Fig
2.0	1.41	0	1	1.30	0	1	1.21	0	1
2.5	1.30	0.02	2	1.19	0.01	2	1.09	0	1
3.0	—	—	—	—	—	—	0.98	0.05	2

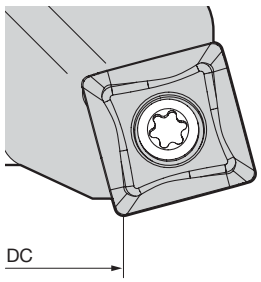
WFXH12000RS type

Dimensions (mm)

Corner Radius	SOMT12○○04-□ (RE0.4)			SOMT12○○08-□ (RE0.8)			SOMT12○○12-□ (RE1.2)			SOMT12○○16-□ (RE1.6)		
	Unmachined surfaces	Gouging	Fig	Unmachined surfaces	Gouging	Fig	Unmachined surfaces	Gouging	Fig	Unmachined surfaces	Gouging	Fig
2.0	2.58	0	1	2.48	0	1	2.37	0	1	2.25	0	1
2.5	2.47	0	1	2.37	0	1	2.25	0	1	2.14	0	1
3.0	2.36	0	1	2.26	0	1	2.14	0	1	2.11	0	1
3.5	2.24	0.01	2	2.14	0	1	2.03	0	1	1.91	0	1
4.0	—	—	—	2.03	0.04	2	1.91	0.03	2	1.8	0.01	2

■ Precautions for Use (2) The cutting diameter DC differs depending on the insert used. We recommend using WFXH type with large corner radius inserts.

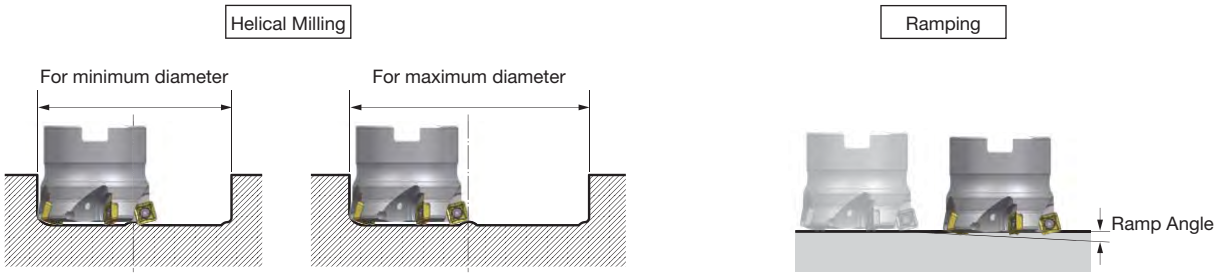




	Body Cat. No.	DCX	DC			
			R0.4	R0.8	R1.2	R1.6
*	WFXH 08025M12Z2	25	10.4	10.9	11.5	—
*	08032M12Z3	32	17.4	17.9	18.5	—
	WFXH 08040RS	40	25.4	25.9	26.5	—
	08050RS	50	35.4	35.9	36.5	—
	08050RS-Z6	50	35.4	35.9	36.5	—
	08063RS	63	48.4	48.9	49.5	—
*	WFXH 12040M12Z3	40	16.6	17.1	17.5	18.1
*	WFXH 12050RS	50	26.6	27.2	27.7	28.2
	12063RS	63	39.5	40.0	40.4	41.1

* mark: Modular Tools H269

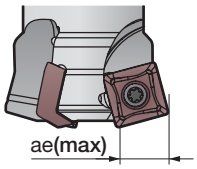
■ Helical Milling and Ramping



Insert Cat. No.	DC	Helical Milling (mm)		Ramping
		Min. Dia.	Max. Dia.	Maximum Ramp Angle
SOMT08○○04-□	**25**	35	49	1.5°
	32	49	63	0.5°
	40	65	79	0.5°
	50	Impossible	Impossible	Impossible
	63	Impossible	Impossible	Impossible
SOMT08○○08-□	**25**	35	48	3°
	32	49	62	1.5°
	40	65	78	1.0°
	50	85	98	0.5°
	63	111	124	0.5°
SOMT08○○12-□	**25**	34	47	4.5°
	32	48	61	2.5°
	40	64	77	1.5°
	50	84	97	1.0°
	63	110	123	0.5°

Insert Cat. No.	DC	Helical Milling (mm)		Ramping
		Min. Dia.	Max. Dia.	Maximum Ramp Angle
SOMT12○○04-□	**40**	56	79	1.0°
	50	76	99	0.5°
	63	Impossible	Impossible	Impossible
SOMT12○○08-□	**40**	56	78	1.5°
	50	76	98	1.0°
	63	102	124	0.5°
SOMT12○○12-□	**40**	55	77	2.5°
	50	75	97	1.5°
	63	101	123	1.0°
SOMT12○○16-□	**40**	55	76	3.5°
	50	75	96	2.0°
	63	101	122	1.5°

■ Maximum Depth of Cut when Plunging



Insert Cat. No.	Max. Depth of Cut ae(max)
SOMT08	6mm
SOMT12	10mm

Lower the feed rate when plunging.

■ Recommended Cutting Conditions

Work Material	Insert Grade	Cutting Speed vc(m/min)	Insert Cat. No.	ø25		ø32		ø40		ø50		ø63	
				ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P General Steel Below 200HB	ACU2500 ACP200 XCU2500	100-**150**-200	**SOMT08**	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
			SOMT12	—	—	—	—	1.0	1.0	1.0	1.0	1.0	1.0
P Alloy Steel Below 45HRC		80-**130**-180	**SOMT08**	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8
			SOMT12	—	—	—	—	0.8	1.0	0.8	1.0	0.8	1.0
M Stainless Steel SUS304, etc.	ACU2500 ACM300	80-**120**-150	**SOMT08**	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7	0.8	0.7
			SOMT12	—	—	—	—	1.0	0.8	1.0	0.8	1.0	0.8
K Cast Iron FC, FCD	ACU2500 ACK200 XCU2500 XCK2000	100-**150**-200	**SOMT08**	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0	0.8	1.0
			SOMT12	—	—	—	—	1.0	1.2	1.0	1.2	1.0	1.2
H Hardened Steel Below 50HRC	ACK300	40- **80**-100	**SOMT08**	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
			SOMT12	—	—	—	—	0.6	0.8	0.6	0.8	0.6	0.8

· The above recommended cutting conditions may require adjustment depending on machine rigidity and work rigidity.
The above figures are guidelines for use with BT50 machine tools.
· The above recommended cutting conditions assume a tool overhang length of L/D=3 (i.e. overhang length of 3 times tool diameter) or less.
When tool overhang is more than L/D = 3 and less than or equal to L/D=5, settings should be adjusted to approximately 70 to 80% of those indicated in the above recommended cutting conditions (ap, fz).
When tool overhang is more than L/D = 5 and less than or equal to L/D=8, settings should be adjusted to approximately 50 to 60% of those indicated in the above recommended cutting conditions (ap, fz).

SEC-WaveMill

WFXH 08000RS type

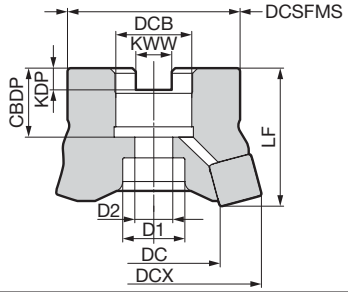
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy | H Hardened Steel

Rake Angle	Radial	-6°
	Axial	6°

1.5mm 15°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1



Body

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	WFXH 08040RS	●	40	*26.5	33	40	16	8.4	5.6	18	14	9	4	0.2	1
	08050RS	●	50	*36.5	41	40	22	10.4	6.3	20	18	11	5	0.3	1
	08050RS-Z6	●	50	*36.5	41	40	22	10.4	6.3	20	18	11	6	0.3	1
	08063RS	●	63	*49.5	50	40	22	10.4	6.3	20	18	11	6	0.5	1

Inserts are sold separately.

* indicates value with corner radius 1.2 inserts mounted. Refer to H175 for details.

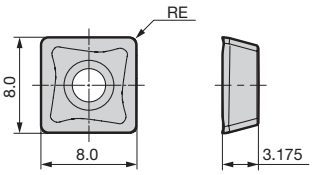
Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet
Process	High-speed/Light Cutting	K M S	P K M	P			K	K		M S		K N	N	
	Medium Cutting	K M S	P K M		P M	P M	K	K		M S	M S		N	P M
	Roughing	K M S			P M	P M			K		M S			P

Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L	●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L	●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G	●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G	●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G	●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H	●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H	●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G	●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G	●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G	●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S *	—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S *	—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S *	—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1

Fig 1



* If the cutting edge strength for high-efficiency milling of non-ferrous metal is insufficient, try a G-type chipbreaker (ACK300).

Recommended Cutting Conditions H176 | Precautions for Use H175

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
	N·m		
BFTX0306IP	2.0	TRDR08IP	SUMI-P

Identification Code

WFXH 08 040 RS - Z6

WFXH	08	040	RS	- Z6
Series Code	Insert Size	Max. Dia.	Metric Bore	Fine Pitch type (with no. of teeth)

WFXH 12000RS type

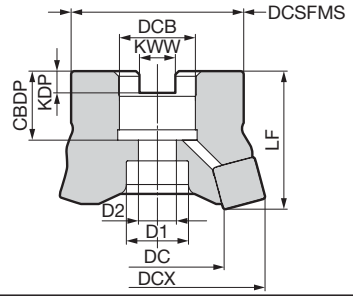
P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy | H Hardened Steel

Rake Angle	Radial	-6°
	Axial	6°

2.5mm 15°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1



Body

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WFXH 12050RS**	●	**50**	*28.2	41	40	**22**	10.4	6.3	20	18	11	4	0.3	1
	12063RS	●	**63**	*41.1	50	40	**22**	10.4	6.3	20	18	11	5	0.4	1

Inserts are sold separately.

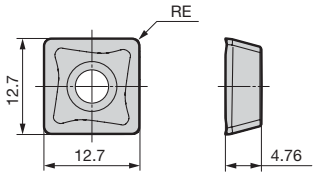
* indicates value with corner radius 1.6 inserts mounted. Refer to H175 for details.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	KS KM	PK PM	P			K	K		MS		KN	N			
	Medium Cutting	KS KM	PK PM		PM	PM	K	K		MS	MS		N	PM		
	Roughing	KS			PM	PM			K		MS			P		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 120408PDER-L		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOMT 120404PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
120408PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
120412PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.2	1
120416PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.6	1
SOMT 120408PDER-H		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOET 120408PDFR-S *		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1

Fig 1



* If the cutting edge strength for high-efficiency milling of non-ferrous metal is insufficient, try a G-type chipbreaker (ACK300).

Recommended Cutting Conditions H176 | Precautions for Use H175

Parts

Flat Insert Screw		Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
	N·m			
BFTX03512IP	**3.0**	HPS1015	TRB15IP	SUMI-P

Identification Code

WFXH **12** **050** **RS**

WFXH	12	050	RS
Series Code	Insert Size	Max. Dia.	Metric Bore

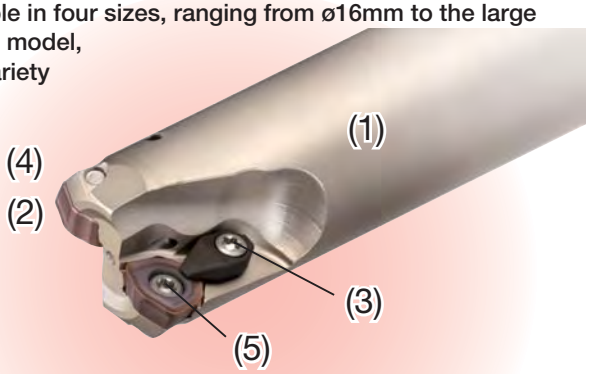
N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

MEMO

MSX series

■ Features

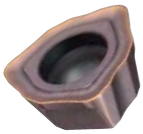
The SEC-Metal Slash Mill MSX type is a multi-purpose cutter capable of roughing at ultra-high feeds.
Its wide application range dramatically boosts efficiency.
Inserts are available in four sizes, ranging from ø16mm to the large diameter ø100mm model, to cover a wide variety of milling needs.



(1) **Highly Durable Body** Special surface treatment improves scratch resistance
(2) **Versatile Machining Operations** Enables ramping, helical milling, and drilling
(3) **Double Clamp** Stable milling with a strong clamp is possible (Dia.22mm or smaller MSX06000 type and MSX08000 type cutters only use a single clamp)
(4) **With Coolant Hole** Improved chip evacuation with air or coolant supply hole and specially shaped pocket design
(5) **Insert Shape** Unique tool shape combines sharpness and cutting edge strength

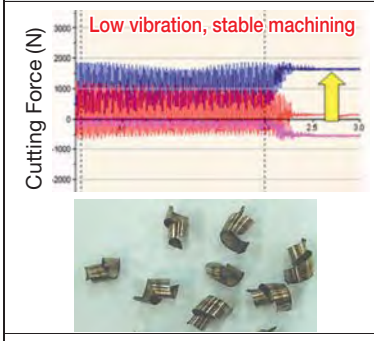
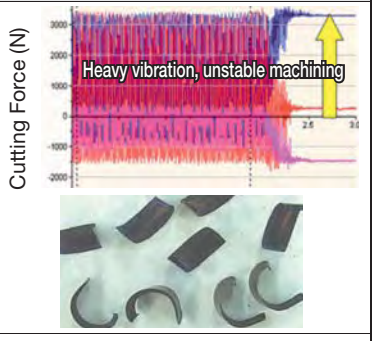
■ Insert Applications and Types

· Insert utilises a special cutting edge profile
· Economical, three-cornered insert

Type	General-purpose type	Strong Edged
Applications	General Milling (First Recommendation)	Interrupted Cutting
Appearance / Features	 Sharper Edge	Emphasis on Fracture Resistance

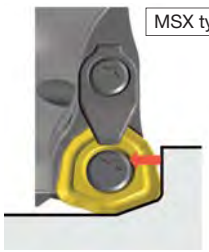
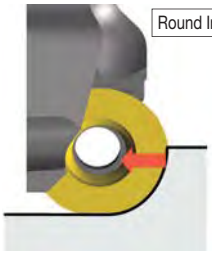
■ Cutting Performance

● Comparison of Cutting Force

MSX type	Conventional Tool
	

Work Material: S50C
Cutting Conditions: vc = 150m/min, fz = 1.0mm/t, ae = 25mm, ap = 2mm

● Shoulder Milling Comparison of MSX type and Conventional Tool

MSX type	Conventional Tool
Performs under high conditions	Prone to chatter
	
Cutting force is consistent even when depth of cut is increased, enabling stable cutting performance.	Greater depth of cut increases contact length, which increases cutting force.

■ Product Range

Type	Cat. No.	Max. Diameter (mm) ø16	ø17	ø18	ø20	ø22	ø25	ø28	ø30	ø32	ø35	ø40	ø50	ø63	ø80	ø100	Applicable Inserts
Shell	MSX 08000RS											4					WDMT 08 type
Shell	MSX 12000RS												4	5			WDMT 12 type
Shell	MSX 14000R (inch)														5	6	
Shell	MSX 14000RS												3	4	5	6	WDMT 14 type
Shank	MSX 06000E(S/M)	2	2	2	3	3	3										WDMT 06 type
Shank	MSX 08000E(S/M)				2	2	2	2		3	3						WDMT 08 type
Shank	MSX 12000E(S/M)									2	2	3	4				WDMT 12 type
Shank	MSX 14000E(S/M)											2	3	4			WDMT 14 type
Modular	MSX 06000M	2		2	3	3	3										WDMT 06 type
Modular	MSX 08000M						2	2	3	3	3						WDMT 08 type
Modular	MSX 12000M									2	2	3					WDMT 12 type

Number in ●●● shows the number of teeth (inch) Inch Bore

Modular type ☞ H270

■ Precautions for Corner Finishing

* Corners will have unmachined surfaces or gouges with respect to the expected corner profile.

Fig 1

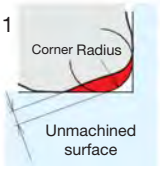
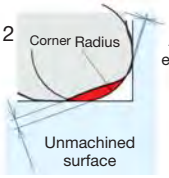


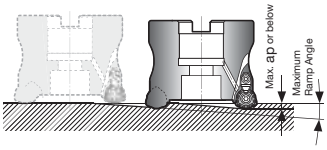
Fig 2



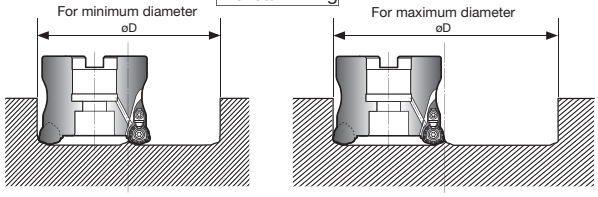
Corner Radius	MSX06000			MSX08000			MSX12000			MSX14000		
	Unmachined surface	Amount of engagement	Fig	Unmachined surface	Amount of engagement	Fig	Unmachined surface	Amount of engagement	Fig	Unmachined surface	Amount of engagement	Fig
2.0	0.403	0	1	0.735	0	1	1.312	0	1	1.642	0	1
2.5	0.263	0.087	2	0.593	0	1	1.171	0	1	1.501	0	1
3.0				0.451	0.031	2	1.030	0	1	1.360	0	1
3.5							0.888	0.001	2	1.219	0	1
4.0										1.078	0.016	2
	(mm)			(mm)			(mm)			(mm)		

■ Ramping and Helical Milling

Ramping



Helical Milling



Centre uncut portion cannot be removed by traverse cutting with the same cutter.

Centre uncut portion can be removed by traverse cutting with the same cutter.

DC (mm)	MSX06000			MSX08000			MSX12000			MSX14000		
	Ramping (°)	Helical Milling (mm)		Ramping (°)	Helical Milling (mm)		Ramping (°)	Helical Milling (mm)		Ramping (°)	Helical Milling (mm)	
	Maximum Ramp Angle	Min. Dia.	Max. Dia.	Maximum Ramp Angle	Min. Dia.	Max. Dia.	Maximum Ramp Angle	Min. Dia.	Max. Dia.	Maximum Ramp Angle	Min. Dia.	Max. Dia.
16	6	21	30									
17	5	23	32									
18	4.5	25	34									
20	3.5	29	38	7.5	25	38						
22	3	33	42	5.5	29	42						
25	2	39	48	4	35	48						
28				3	41	54						
32				2.5	49	62	6.5	42	62			
35				2	55	68	5	48	68			
40				2	65	78	4	58	78	6	53	78
50							2.5	78	98	3.5	73	98
63							2	103	124	2	99	124
80										1.5	133	158
100										1	173	198

■ Recommended Cutting Conditions

(mm)

Insert Cat. No.	Max. ap	RE	Approx. RE
WDMT 0603	1.0	1.5	2.0
WDMT 0804	1.5	2.0	2.5
WDMT 1205	2.0	2.0	3.0
WDMT 1406	2.5	2.0	3.5

(ap Depth of Cut fz Feed Rate)

Work Material	Insert Grades	Cutting Speed vc (m/min)	Insert Cat. No.	Shank type										Shell type			
				ø16		ø20		ø25		ø32		ø40		ø50/ø63		ø80/ø100	
				ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P General Steel Below 200HB	ACP200	100-**150**-200	**WDMT 0603**	0.8	0.8	0.8	0.8	—	—	—	—	—	—	—	—	—	—
			WDMT 0804	—	—	1.0	1.0	1.0	1.2	1.0	1.2	—	—	—	—	—	—
			WDMT 1205	—	—	—	—	—	—	1.2	1.4	1.2	1.4	1.2	1.4	—	—
			WDMT 1406	—	—	—	—	—	—	—	—	1.5	1.5	1.5	1.5	1.5	1.5
P Alloy Steel Below 45HRC	ACP200	80-**130**-180	**WDMT 0603**	0.7	0.8	0.7	0.8	—	—	—	—	—	—	—	—	—	—
			WDMT 0804	—	—	0.8	1.0	0.8	1.2	0.8	1.2	—	—	—	—	—	—
			WDMT 1205	—	—	—	—	—	—	1.0	1.4	1.0	1.4	1.0	1.4	—	—
			WDMT 1406	—	—	—	—	—	—	—	—	1.3	1.5	1.3	1.5	1.3	1.5
M Stainless Steel SUS304, etc.	ACP300	80-**120**-150	**WDMT 0603**	0.8	0.7	0.8	0.7	—	—	—	—	—	—	—	—	—	—
			WDMT 0804	—	—	1.0	0.8	1.0	0.8	1.0	0.8	—	—	—	—	—	—
			WDMT 1205	—	—	—	—	—	—	1.2	1.2	1.2	1.2	1.2	1.2	—	—
			WDMT 1406	—	—	—	—	—	—	—	—	1.5	1.3	1.5	1.3	1.5	1.3
K Cast Iron FC, FCD	ACK200 ACK300	100-**150**-200	**WDMT 0603**	0.8	1.0	0.8	1.0	—	—	—	—	—	—	—	—	—	—
			WDMT 0804	—	—	1.0	1.2	1.0	1.4	1.0	1.4	—	—	—	—	—	—
			WDMT 1205	—	—	—	—	—	—	1.2	1.5	1.2	1.5	1.2	1.5	—	—
			WDMT 1406	—	—	—	—	—	—	—	—	1.5	1.8	1.5	1.8	1.5	1.8
H Hardened Steel Below 50HRC	ACK200 ACK300	40-**80**-100	**WDMT 0603**	0.5	0.5	0.5	0.5	—	—	—	—	—	—	—	—	—	—
			WDMT 0804	—	—	0.5	0.6	0.5	0.8	0.5	0.8	—	—	—	—	—	—
			WDMT 1205	—	—	—	—	—	—	0.6	1.0	0.6	1.0	0.6	1.0	—	—
			WDMT 1406	—	—	—	—	—	—	—	—	1.0	1.2	1.0	1.2	1.0	1.2

· The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
The above figures are guidelines for use with BT50 machine tools.

· The above recommended cutting conditions assume a tool overhang length of L/D=3 (i.e. overhang length of 3 times tool diameter) or less.
When tool overhang is more than L/D = 3 and less than or equal to L/D=5, settings should be adjusted to approximately 70 to 80% of those indicated in the above recommended cutting conditions (ap, fz).
When tool overhang is more than L/D = 5 and less than or equal to L/D=8, settings should be adjusted to approximately 50 to 60% of those indicated in the above recommended cutting conditions (ap, fz).

MSX 08000RS/12000RS/14000R(S) type

P Steel M Stainless Steel K Cast Iron H Hardened Steel

Rake Angle		
	Radial	-3° to -8°
	Axial	8°

1.5mm 20° (08000 type) 2.0mm 20° (12000 type) 2.5mm 20° (14000 type)

Face Milling, Shoulder Milling, Groove Milling, Ramping, Profiling, Plunge Milling, Helical Milling

Fig 1

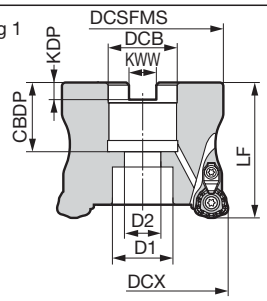
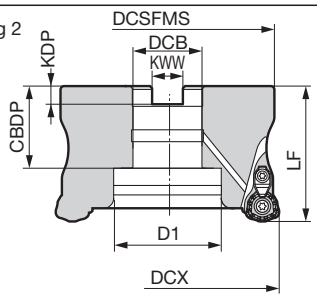


Fig 2



Body (Applicable Insert WDMT08 type)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**MSX 08040RS**	●	**40**	37	45	**16**	8.4	5.6	18	13.5	9	4	0.2	1

Body (Applicable Insert WDMT12 type)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**MSX 12050RS**	●	**50**	47	50	**22**	10.4	6.3	20	18	11	4	0.3	1
	12063RS	●	**63**	60	50	**22**	10.4	6.3	20	18	11	5	0.6	1

Body (Applicable Insert WDMT14 type)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**MSX 14050RS**	●	**50**	47	50	**22**	10.4	6.3	20	17	11	3	0.3	1
	14063RS	●	**63**	60	50	**22**	10.4	6.3	20	18	11	4	0.6	1
	14080RS	●	***80**	76	63	**27**	12.4	7.0	25	20	13.5	5	1.4	1
	14100RS	●	**100**	96	63	**32**	14.4	8.5	32	44	—	6	2.2	2
Inch	**MSX 14080R**	●	***80**	76	63	**31.75**	12.7	8.0	32.5	28	17	5	1.3	1
	14100R	●	***100**	96	63	**31.75**	12.7	8.0	32.5	28	17	6	2.4	1

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

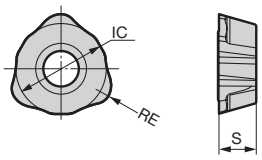
Insert

Dimensions (mm)

Grade Classification		Coated Carbide			
Process	High-speed/Light Cutting			K H	
	General-purpose	P M	P M	K H	
	Roughing	P M	P M		K H

Applications	Cat. No.	ACP200	ACP300	ACK200	ACK300	Inscribed Circle IC	Thickness S	Corner Radius RE	Applicable Cutter	Fig
General-purpose	**WDMT 0804ZDTR**	●	●	●	●	8.5	4.0	2.0	MSX08000R type	1
	1205ZDTR	●	●	●	●	12.0	5.0	2.0	MSX12000R type	1
	1406ZDTR	●	●	●	●	14.0	6.0	2.0	MSX14000R type	1
Honed type	**WDMT 0804ZDTR-H**	●	●	●	●	8.5	4.0	2.0	MSX08000R type	1
	1205ZDTR-H	●	●	●	●	12.0	5.0	2.0	MSX12000R type	1
	1406ZDTR-H	●	●	●	●	14.0	6.0	2.0	MSX14000R type	1

Fig 1



Recommended Cutting Conditions H181

Identification Code

MSX 08 040 R S

Series Code	Insert Size	Max. Dia.	Feed Direction	Metric Bore

Parts

Applicable Cutter	Flat Insert Screw	N·m	Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Clamp Plate	C-Ring	Cap Screw	Anti-seizure Cream
MSX08000R type	BFTX0306IP	2.0	TRDR08IP	—	—	CCH3.5	CR03	BFTX03510IP08	SUMI-P
MSX12000R type	BFTX0409IP	3.0	—	HPS1015	TRB15IP	CCH3.5	CR03	BFTX03510IP15	
MSX14000R type	BFTX0511IP	5.0	—	HPL2025	TRB20IP	CCH4.5	CR03	BFTX04513IP20	

N·m Recommended Tightening Torque (N·m)

MSX 06000E(S/M)/08000E(S/M)/12000E(S/M)/14000E(S/M) type

P Steel | M Stainless Steel | K Cast Iron | H Hardened Steel

Rake Angle		
	Radial	-3° to -8°
	Axial	8°

1.0mm 20° (06000 type) | 1.5mm 20° (08000 type) | 2.0mm 20° (12000 type) | 2.5mm 20° (14000 type)

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1 (Single Clamp)

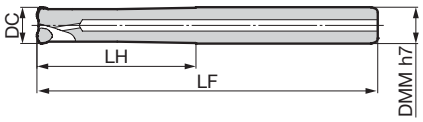
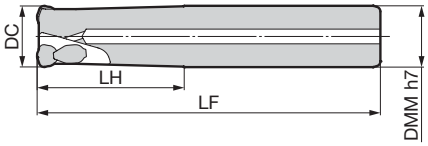


Fig 2 (Double Clamp)



Body (Applicable Insert WDMT06 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
MSX 06016ES	●	**16**	16	30	110	2	0.2	1
06016EM	●	**16**	16	70	150	2	0.2	1
06017EM	●	**17**	16	20	150	2	0.2	1
06018EM	●	**18**	16	20	150	2	0.2	1
06020ES	●	**20**	20	50	130	3	0.3	1
06020EM	●	**20**	20	100	180	3	0.4	1
06022EM	●	**22**	20	30	180	3	0.4	1
06025ES	●	**25**	25	60	140	3	0.5	1
06025EM	●	**25**	25	120	250	3	0.8	1

Body (Applicable Insert WDMT08 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
MSX 08020ES	●	**20**	20	50	130	2	0.3	1
08020EM	●	**20**	20	100	180	2	0.3	1
08022EM	●	**22**	20	30	180	2	0.4	1
08025ES	●	**25**	25	60	140	2	0.4	2
08025EM	●	**25**	25	120	250	2	0.8	2
08028EM	●	**28**	25	40	250	2	0.9	2
08032ES	●	**32**	32	70	150	3	0.8	2
08032EM	●	**32**	32	120	250	3	1.4	2
08035EM	●	**35**	32	50	250	3	1.5	2

Body (Applicable Insert WDMT12 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
MSX 12032ES	●	**32**	32	70	150	2	0.8	2
12032EM	●	**32**	32	120	250	2	1.4	2
12035EM	●	**35**	32	50	250	2	1.4	2
12040ES	●	**40**	32	50	150	3	0.9	2
12040EM	●	**40**	32	50	250	3	1.5	2
12050EM	●	**50**	42	50	250	4	2.6	2

Body (Applicable Insert WDMT14 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
MSX 14040ES	●	**40**	32	50	150	2	0.9	2
14040EM	●	**40**	32	50	250	2	1.5	2
14050ES	●	**50**	42	50	150	3	1.5	2
14050EM	●	**50**	42	50	250	3	2.5	2
14063ES	●	**63**	42	50	150	4	1.7	2
14063EM	●	**63**	42	50	250	4	2.8	2

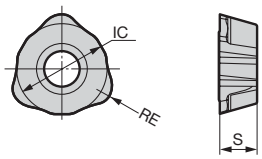
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								
Process	High-speed/Light Cutting			●						
	General-purpose	●	●	●						
	Roughing	●	●		●					
Applications	Cat. No.	ACP200	ACP300	ACK200	ACK300	Inscribed Circle IC	Thickness S	Corner Radius RE	Applicable Cutter	Fig
General-purpose	**WDMT 0603ZDTR**	●	●	●	●	6.35	3.0	1.5	MSX06000E type	1
	0804ZDTR	●	●	●	●	8.5	4.0	2.0	MSX08000R type	1
	1205ZDTR	●	●	●	●	12.0	5.0	2.0	MSX12000R type	1
	1406ZDTR	●	●	●	●	14.0	6.0	2.0	MSX14000R type	1
Honed type	**WDMT 0603ZDTR-H**	●	●	●	●	6.35	3.0	1.5	MSX06000E type	1
	0804ZDTR-H	●	●	●	●	8.5	4.0	2.0	MSX08000R type	1
	1205ZDTR-H	●	●	●	●	12.0	5.0	2.0	MSX12000R type	1
	1406ZDTR-H	●	●	●	●	14.0	6.0	2.0	MSX14000R type	1

Fig 1



Recommended Cutting Conditions ☞H181

Identification Code

MSX 06 016 E S

Series Code	Insert Size	Max. Dia.	Shank type	S: Short M: Medium

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Clamp Plate	C-Ring	Cap Screw	Anti-seizure Cream
MSX06000E type	BFTX02505IP	1.5	TRDR08IP	—	—	—	SUMI-P
MSX08020E, MSX08022E type	BFTX0306IP	2.0	TRDR08IP	—	—	—	
Other MSX08000E types not described above	BFTX0306IP	2.0	TRDR08IP	CCH3.5	CR03	BFTX03510IP08	
MSX12000E type	BFTX0409IP	3.0	TRDR15IP	CCH3.5	CR03	BFTX03510IP15	
MSX14000E type	BFTX0511IP	5.0	TRDR20IP	CCH4.5	CR03	BFTX04513IP20	

N·m Recommended Tightening Torque (N·m)

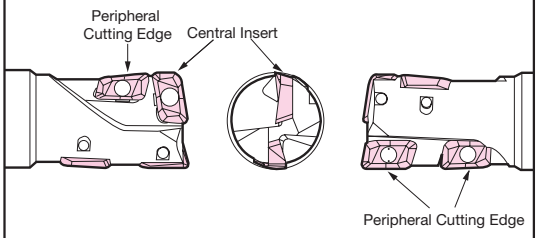
WMM series

■ Features

A multi-functional cutter that performs a variety of operations such as groove milling, shoulder milling, ramping, pocketing, drilling, helical milling, etc., using WaveMill inserts.
With low cutting force and excellent chip evacuation, it is also effective for consolidating tools.

- The WMM type alone can perform a number of operations such as shoulder milling, groove milling and drilling
- Excellent for high-efficiency ramping, helical drilling and pocketing
- Uses WaveMill inserts for sharpness and cutting edge strength
- The reduction in cutting force enables the same chip evacuation as conventional tools but with less force required
- Easy tool management as only 1 type of insert is used
- Also ideal for stainless steel machining

● WMM type insert arrangement

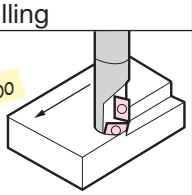


■ Applications: WMM2025E

● Shoulder Milling

SUS304

Cuts stainless steel too

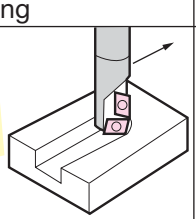


Diameter of Tool: ø25
Insert: APMT103504PDER (ACZ350)
Depth of Cut: ap = 25mm, ae = 5mm
Cutting Speed: vc = 120m/min, Feed Rate: fz = 0.15mm/t
Air Blow

● Groove Milling

FC250

Deep groove milling can be performed easily. Easy chip removal

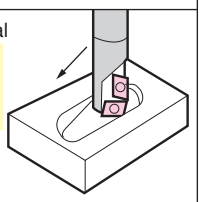


Diameter of Tool: ø25
Insert: APMT103504PDER (ACZ310)
Depth of Cut: ap = 15mm, ae = 25mm
Cutting Speed: vc = 180m/min, Feed Rate: fz = 0.12mm/t
Air Blow

● Ramping

S50C Block Material

Capable of ramping without prepared holes

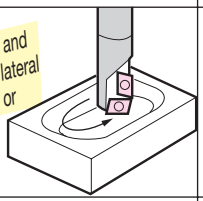


Diameter of Tool: ø25
Insert: APMT103504PDER (ACZ350)
Cutting Width: ae = 25mm, Depth: ap = 15mm
Cutting Speed: vc = 200m/min, Feed Rate: fz = 0.1mm/t
Ramp Angle: θ=15°
Air Blow

● Pocketing

S50C Block Material

Capable of traverse cutting and pocketing with continuous lateral feed from the initial drilling or ramping process

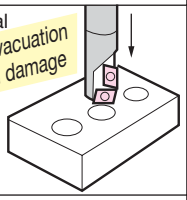


Diameter of Tool: ø25
Insert: APMT103504PDER (ACZ350)
Machining done continuously from a deep drilling process with a depth of 15mm
Cutting Width: ae = 25mm, Depth ap = 15mm
Cutting Speed: vc = 200m/min, Feed Rate: fz = 0.1mm/t
Air Blow

● Drilling

S50C Block Material

Capable of easy chip evacuation and drilling without tool damage

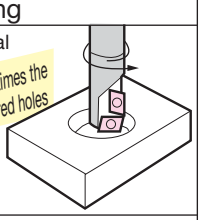


Diameter of Tool: ø25
Insert: APMT103504PDER (ACZ350)
Hole Diameter: ø25mm, Depth: ap = 15mm
Cutting Speed: vc = 200m/min, Feed Rate: f = 0.1mm/rev
Step Feed: 0.5mm
Air Blow

● Helical Milling

S50C Block Material

Capable of large boring with diameters 1.2-1.8 times the cutter diameter without prepared holes



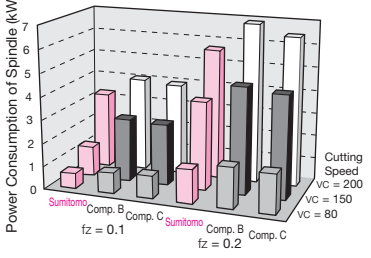
Diameter of Tool: ø25
Insert: APMT103504PDER (ACZ350)
Hole Diameter: ø40mm, Depth: ap = 20mm
Cutting Speed: vc = 300m/min, Feed Rate: f = 0.1mm/rev
Axial Feed: 15mm/Pitch
Air Blow

■ Product Range and Performance

Type	Cat. No.	Description	Dia. (mm)												
			ø20	ø21	ø22	ø24.7	ø25	ø26	ø27	ø28	ø30	ø32	ø33	ø35	ø40
Shank	WMM 2000E	Standard type	1	1			1	1			1				
	WMM 2000EL	Long type	1	1			1	1			1				
	WMM 2000ELH	Long type w/ Coolant Hole	1	1			1	1			1				
	WMM 2000EXLH	Extra-Long type w/ Coolant Hole			(1)				(1)		(1)				
	WMM 3000E	Standard type										1	1	1	1
	WMM 3000EL	Long type										1	1	1	1
	WMM 3000ELH	Long type w/ Coolant Hole										1	1	1	1
	WMM 3000EXLH	Extra-Long type w/ Coolant Hole												(1)	(1)

Number in ●○ shows the number of teeth

● Performance Comparison (Groove Milling)



Diameter of Tool: ø25
Work Material: S50C
Cutting Conditions: vc = 80,150,200m/min, fz = 0.1, 0.2mm/t
ap = 15mm, Tool Overhang = 40mm

WMM 2000E/EL/ELH/EXLH type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal

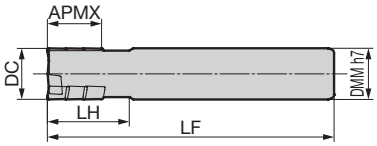
Rake Angle	Radial	15° to 16°
	Axial	7° to 11°

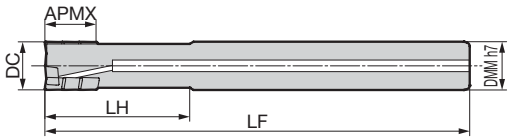
17 to 35mm | 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Drilling | Profiling | Plunge Milling | Helical Milling

Fig 1

Fig 2





Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	Effective No. of Teeth	Fig
WMM 2020E	●	**20**	17	20	35	130	3	1	2
2021E	●	**21**	17	20	35	130	3	1	1
2025E	●	**25**	26	25	40	140	4	1	2
2026E	●	**26**	26	25	40	140	4	1	1
2030E	●	**30**	35	25	50	150	5	1	1

Body (Long Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	Effective No. of Teeth	Fig
WMM 2020EL	●	**20**	17	20	60	185	3	1	2
2021EL	●	**21**	17	20	35	185	3	1	1
2025EL	●	**25**	26	25	75	220	4	1	2
2026EL	●	**26**	26	25	40	220	4	1	1
2030EL	●	**30**	35	25	50	230	5	1	1

Body (Long Shank type / With Coolant Holes)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	Effective No. of Teeth	Fig
WMM 2020ELH	●	**20**	17	20	60	185	3	1	2
2021ELH	●	**21**	17	20	35	185	3	1	2
2025ELH	●	**25**	26	25	75	220	4	1	2
2026ELH	●	**26**	26	25	40	220	4	1	2
2030ELH	●	**30**	35	25	50	230	5	1	2

Body (Extra Long Shank type / With Coolant Holes)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	Effective No. of Teeth	Fig
WMM 2022EXLH		**22**	17	20	35	250	3	1	2
2027EXLH		**27**	26	25	40	320	4	1	2
2030EXLH		**30**	35	25	50	350	5	1	2

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

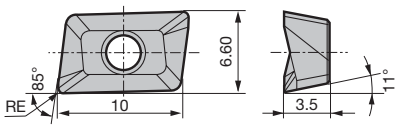
Insert

Dimensions (mm)

Grade Classification		Coated Carbide			Cermented Carbide	DLC		
Process	High-speed/Light Cutting				K N	N		
	General-purpose	M	P	K		N		
	Roughing							
Cat. No.		ACZ350	ACZ330	ACZ310	H1	DL1000	Corner Radius RE	Fig
APMT 103504PDER		●	●	●	—	—	0.4	1
103508PDER		●	●	●	—	—	0.8	1
103512PDER		●	●	●	—	—	1.2	1
APMT 103504PDER-H		●	●	●	—	—	0.4	1
103508PDER-H		●	●	●	—	—	0.8	1
103512PDER-H		●	●	●	—	—	1.2	1
APET 103504PDER-F		●	●	●	—	—	0.4	1
APET 103504PDFR-S		—	—	—	●	●	0.4	1

-H: Strong Edged, -F: Ground type Insert, -S: For Aluminum Alloy.

Fig 1



Parts (Common)

Applicable Cutter	Flat Insert Screw		Wrench	Anti-seizure Cream
WMM2000 type	BFTX02506N	N·m 1.5	TRD08	SUMI-P
WMM3000 type	BFTX03584	N·m 3.0	TRD15	SUMI-P

Recommended Cutting Conditions Diameter ø20 to ø26mm (Not for extra-long type)

ISO	Work Material	Hardness	Cutting Speed Vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.		Insert Grades
P	Carbon Steel	180 to 280HB	80- **120** -160	Shoulder Milling	0.05- **0.13** -0.20	ACZ330
				Groove Milling	0.05- **0.09** -0.12	
				Drilling	0.05- **0.12** -0.18	
M	Stainless Steel	—	80- **100** -120	Shoulder Milling	0.05- **0.10** -0.15	ACZ350
				Groove Milling	0.05- **0.08** -0.10	
				Drilling	0.05- **0.09** -0.12	
K	Cast Iron	250HB	70- **150** -180	Shoulder Milling	0.05- **0.13** -0.20	ACZ310
				Groove Milling	0.05- **0.09** -0.12	
				Drilling	0.05- **0.12** -0.18	
N	Aluminum Alloy	—	200- **300** -500	Shoulder Milling	0.10- **0.15** -0.20	DL1000
				Groove Milling	0.05- **0.08** -0.10	
				Drilling	0.05- **0.08** -0.10	

Note: The cutting conditions are guidelines. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Recommended Cutting Conditions Diameter ø30 to ø40mm (Not for extra-long type)

ISO	Work Material	Hardness	Cutting Speed Vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.		Insert Grades
P	Carbon Steel	180 to 280HB	80- **120** -160	Shoulder Milling	0.05- **0.15** -0.25	ACZ330
				Groove Milling	0.05- **0.10** -0.15	
				Drilling	0.05- **0.13** -0.20	
M	Stainless Steel	—	80- **100** -120	Shoulder Milling	0.05- **0.13** -0.20	ACZ350
				Groove Milling	0.05- **0.09** -0.12	
				Drilling	0.05- **0.12** -0.18	
K	Cast Iron	250HB	70- **150** -180	Shoulder Milling	0.05- **0.15** -0.25	ACZ310
				Groove Milling	0.05- **0.10** -0.15	
				Drilling	0.05- **0.13** -0.20	
N	Aluminum Alloy	—	200- **300** -500	Shoulder Milling	0.10- **0.15** -0.20	DL1000
				Groove Milling	0.05- **0.08** -0.10	
				Drilling	0.05- **0.08** -0.10	

Note: The cutting conditions are guidelines. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

WMM 3000E/EL/ELH/EXLH type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal

Rake Angle		
	Radial	17° to 19°
	Axial	7° to 11°

39mm, 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Drilling | Profiling | Plunge Milling | Helical Milling

Fig 1

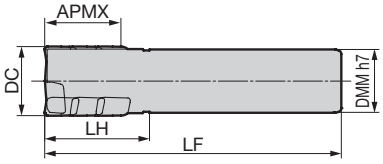
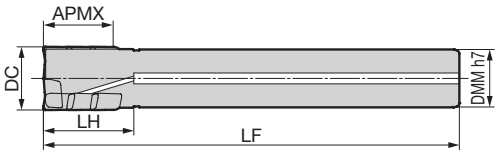


Fig 2



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	Effective No. of Teeth	Fig
WMM 3032E	●	**32**	39	32	50	150	4	1	2
3033E	●	**33**	39	32	50	150	4	1	1
3035E	●	**35**	39	32	50	150	4	1	1
3040E	●	**40**	39	32	55	160	4	1	1

Body (Long Shank type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	Effective No. of Teeth	Fig
WMM 3032EL	●	**32**	39	32	90	230	4	1	2
3033EL	●	**33**	39	32	50	230	4	1	1
3035EL	●	**35**	39	32	50	230	4	1	1
3040EL	●	**40**	39	32	55	240	4	1	1

Body (Long Shank type / With Coolant Holes)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	Effective No. of Teeth	Fig
WMM 3032ELH	●	**32**	39	32	90	230	4	1	2
3033ELH	●	**33**	39	32	50	230	4	1	2
3035ELH	●	**35**	39	32	50	230	4	1	2
3040ELH	●	**40**	39	32	55	240	4	1	2

Body (Extra Long Shank type / With Coolant Holes)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Overall Length LF	Total No. of Teeth	Effective No. of Teeth	Fig
WMM 3035EXLH		**35**	39	32	50	370	4	1	2
3040EXLH		**40**	39	32	55	420	4	1	2

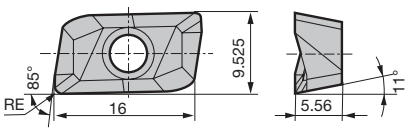
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide			Cemented Carbide	DLC		
Process	High-speed/Light Cutting				K N	N		
	General-purpose	M	P	K		N		
	Roughing							
Cat. No.		ACZ350	ACZ330	ACZ310	H1	DL1000	Corner Radius RE	Fig
APMT 160508PDER		●	●	●	—	—	0.8	1
160512PDER		●	●	●	—	—	1.2	1
160516PDER		●	●	●	—	—	1.6	1
APMT 160508PDER-H		●	●	●	—	—	0.8	1
160512PDER-H		●	●	●	—	—	1.2	1
160516PDER-H		●	●	●	—	—	1.6	1
160520PDER-H*		●	●	●	—	—	2.0	1
160530PDER-H*		●	●	●	—	—	3.0	1
160540PDER-H*		●	●	●	—	—	4.0	1
160550PDER-H*		●	●	●	—	—	5.0	1
160560PDER-H*		●	●	●	—	—	6.0	1
APET 160508PDER-F		●	●	●	—	—	0.8	1
APET 160508PDFR-S		—	—	—	●	●	0.8	1

Fig 1



-H: Strong Edged, -F: Ground type Insert, -S: For Aluminum Alloy.

* marked inserts require modification of the cutter body. Correct the tool diameter by +0.5mm before use.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WMM2000 type	BFTX02506N	1.5	TRD08	SUMI-P
WMM3000 type	BFTX03584	3.0	TRD15	SUMI-P

Recommended Cutting Conditions Diameter ø30 to ø40mm (Not for extra-long type)

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t)	Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	80-**120**-160	Shoulder Milling	0.05-**0.15**-0.25	ACZ330
				Groove Milling	0.05-**0.10**-0.15	
				Drilling	0.05-**0.13**-0.20	
M	Stainless Steel	—	80-**100**-120	Shoulder Milling	0.05-**0.13**-0.20	ACZ350
				Groove Milling	0.05-**0.09**-0.12	
				Drilling	0.05-**0.12**-0.18	
K	Cast Iron	250HB	70-**150**-180	Shoulder Milling	0.05-**0.15**-0.25	ACZ310
				Groove Milling	0.05-**0.10**-0.15	
				Drilling	0.05-**0.13**-0.20	
N	Aluminum Alloy	—	200-**300**-500	Shoulder Milling	0.10-**0.15**-0.20	DL1000
				Groove Milling	0.05-**0.08**-0.10	
				Drilling	0.05-**0.08**-0.10	

Note: The cutting conditions are guidelines. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

MEMO

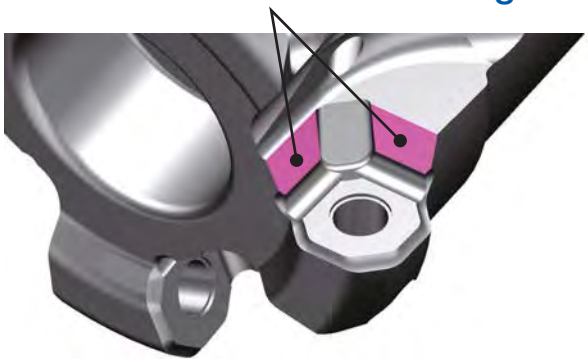
RSE series

■ Features

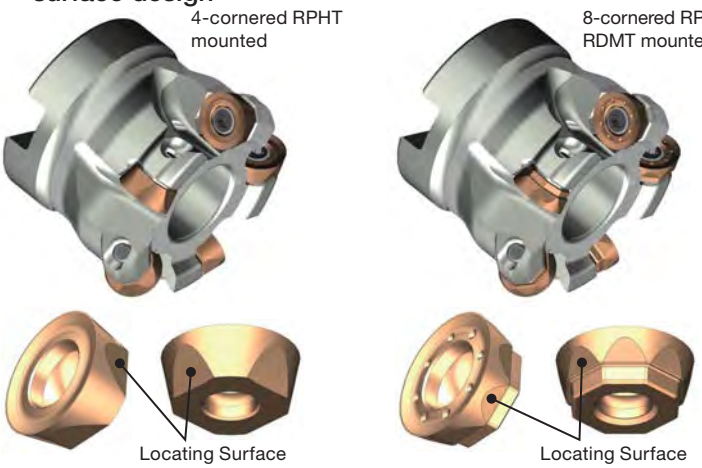
- **High-efficiency, high-rigidity radius cutter**
  Wide insert seat face design achieves high efficiency machining of stainless steel etc.
  Designed for superior durability
  Ideal for roughing of aerospace components such as turbine blades
- **Lineup of ground type and M class inserts**
  In addition to the 4-cornered ground type inserts, economical 8-cornered M Class inserts are also available
- **Uses new grades for exotic alloy machining**
  New XCS2000/ACS2500/ACS3000 grades achieve stable and long tool life in machining exotic alloys, such as titanium alloys and Ni-based heat-resistant alloys, as well as stainless steel

■ High-rigidity clamp design

Wide Insert Seat Face Design



■ Cutter body can be shared by optimizing the locating surface design



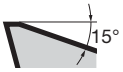
4-cornered ground type inserts or 8-cornered M Class inserts can be used on the same cutter body

■ Product Range

Type	Cat. No.	Max. Diameter (mm)							
		ø25	ø32	ø40	ø42	ø50	ø52	ø63	ø80
Shell	RSE 10000RS○○			5		6			
	RSE 12000RS○○			4	4	5 6	5	6	8
	RSE 12000R○○ Inch								8
Shank	RSE 10000E○○	2 3	3 4						

Number in ●● shows the number of teeth Inch Inch Bore

■ Chipbreaker Shape

Work Material	M Stainless Steel, S Exotic Alloy
Applications	General-purpose to Roughing
Features	Standard
Chipbreaker	**G type**
Cutting Edge Cross Section	

■ Grade Features

Work Material	Grade	Coating Thickness (μm)	Features
M Stainless Steel / S Exotic Alloy	**XCS2000**	4	New coating combining wear and fracture resistance realises superb long tool life in medium to high speed machining of **heat-resistant alloys** and **stainless steel**
	ACS2500	3	Coating with excellent wear and adhesion resistance provides outstanding performance especially in machining **titanium alloys**
	ACS3000	3	High toughness carbide substrate and a coating with excellent chipping resistance provide outstanding stability in a wide range of work materials such as **heat-resistant alloys**, **stainless steel**, and **titanium alloys**

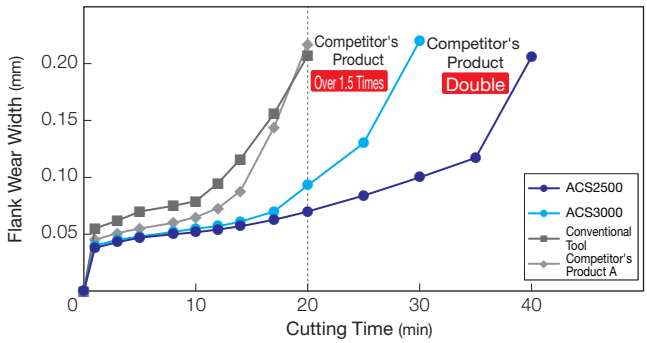
■ Grade Application Range

Newly developed **XCS2000/ACS2500/ACS3000** grades, ideal for machining titanium alloys, heat-resistant alloys and stainless steel, are now available!

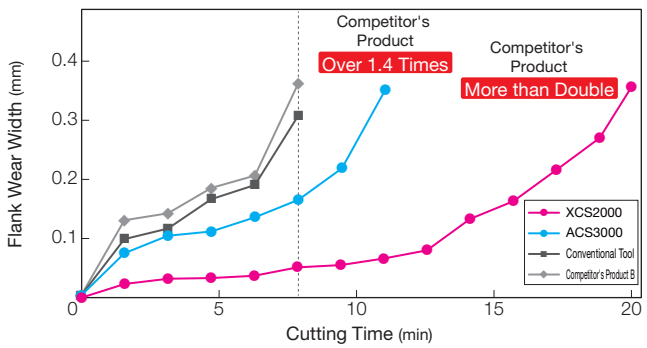
Work Material		Finishing to Light Cutting	Medium Cutting	Rough to Heavy Cutting
M Stainless Steel / S Exotic Alloy	Coating	New XCS2000 (C)		
			ACS2500 (P)	
				ACS3000 (P)

The letters "C" and "P" at the end of each grade indicate the coating type.
C: CVD P: PVD

■ Cutting Performance



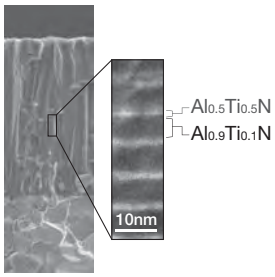
Machine	: Vertical Machining Centre BT40, Work Material: Ti-6Al-4V
Tool	: RSE 12050RS05, Insert: RPHT1204M0EN-G
Cutting conditions	: vc = 70m/min fz = 0.25mm/t ap = 2mm ae = 30mm Wet



Machine	: Vertical Machining Centre BT40, Work Material: Inconel 718 (44HRC)
Tool	: RSE 12050RS05, Insert: RPHT1204M0EN-G
Cutting conditions	: vc = 40m/min fz = 0.3mm/t ap = 2mm ae = 30mm Wet

New CVD Coating Layer Features

ABSOTECH X — CVD



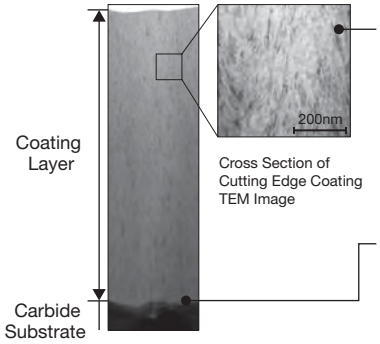
Pure Cubic Crystal AlTiN with High Al Content
With proprietary structural control technology, differently composed layers of AlTiN are stacked at the nanometre level.
With a high-Al composition containing over 80% Al on average, it also maintains a cubic crystalline structure to achieve excellent thermal resistance and high hardness.
Vastly improved wear resistance.

Special Surface Treatment
Proprietary surface treatment introduces high compression stress to the coating, suppressing the development of cracks.
Greatly improved fracture and thermal crack resistance.

Applicable Grade: XCS2000

New PVD Coating Layer Features

ABSOTECH — PVD

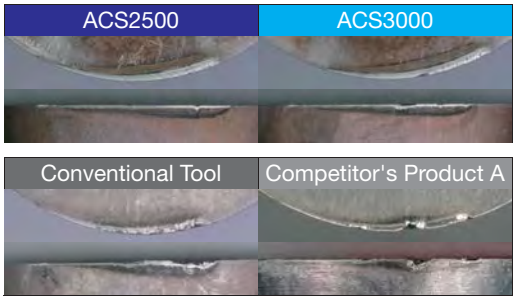


Ultra-fine Grained B Additive
- New AlTiBN coating, with an ultra-fine coating structure, achieves high strength and toughness
- Outstanding chipping resistance and wear resistance

High Adhesion Strength
Significantly improved coating adhesion and more than 2x conventional chipping resistance

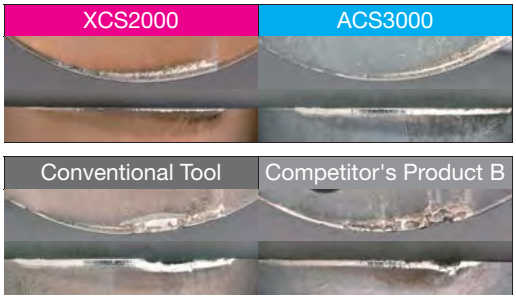
Applicable Grades: ACS2500, ACS3000

After cutting for 20 minutes



Superb wear resistance for a tool life 1.5 times greater than that of conventional tools and competitor's products

After cutting for 7.9 minutes



Superb fracture resistance for a tool life 1.4 times greater than that of conventional tools and competitor's products

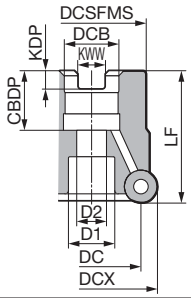
RSE 10000RS type

Rake Angle		
Radial	-5°	
Axial	4°	

5mm 4-cornered | 1.4mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSE 10040RS05**	●	**40**	30	33	40	16	8.4	5.6	18	14	9	5	0.16	1
	10050RS06	●	**50**	40	40	40	22	10.4	6.3	20	18	11	6	0.27	1

Inserts are sold separately.

Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure Cream
		Handle Grip	Bit	
BFTX03584IP	3.0	HPS1015	TRB15IP	SUMI-P

Identification Code

RSE **10** **040** **R** **S** **05**

Series Code	Insert Size	Max. Dia.	Feed Direction	Metric Bore	Number of Teeth

Insert

Dimensions (mm)

Grade Classification		Coated Carbide		
Process	High-speed/Light Cutting	M S	M S	
	Medium Cutting	M S	M S	M S
	Roughing			M S

Cat. No.	XCS2000 (New)	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Fig
RPHT10T3M0EN-G	●	●	●	10	3.97	1
RPMT10T3M0EN-G	●	●	●	10	3.97	2
RDMT10T3M0EN-G	●	●	●	10	3.97	3

Fig 1 4-cornered

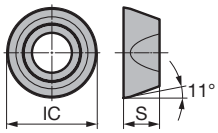


Fig 2 8-cornered

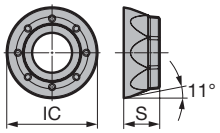
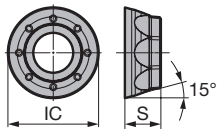


Fig 3 8-cornered



Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
S	Exotic Alloy	Heat-Resistant Alloy	—	G	25 - **35** - 50	0.15 - **0.25** - 0.35	XCS2000/ACS2500/ACS3000
		Ti Alloy	—	G	30 - **60** - 90	0.15 - **0.25** - 0.35	ACS2500/ACS3000
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200HB	G	115 - **145** - 175	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000
		SUS403 and Others (Martensitic/Hardened)	240HB	G	105 - **130** - 155	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000
		SUS304, SUS316 (Austenitic)	180HB	G	125 - **155** - 190	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000

Note
- The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
- For groove milling, calculate the feed rate at around 70% of the above values.
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

RSE 12000R(S) type

M Stainless Steel S Exotic Alloy

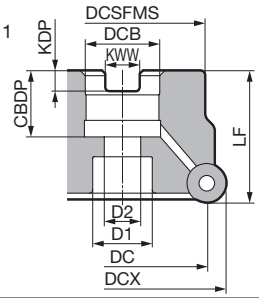
New

Rake Angle	Radial	-5°
	Axial	4°

6mm 4-cornered | 1.7mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Body (Shell type)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSE 12040RS04**	●	**40**	28	33	40	**16**	8.4	5.6	18	13.5	9	4	0.15	1
	12042RS04	●	**42**	30	33	40	**16**	8.4	5.6	18	14	9	4	0.17	1
	12050RS05	●	**50**	38	41	40	**22**	10.4	6.3	20	18	11	5	0.24	1
	12050RS06	●	**50**	38	41	40	**22**	10.4	6.3	20	18	11	6	0.23	1
	12052RS05	●	**52**	40	41	40	**22**	10.4	6.3	20	18	11	5	0.26	1
	12063RS06	●	**63**	51	50	40	**22**	10.4	6.3	20	18	11	6	0.47	1
	12080RS08	●	* **80**	68	55	50	**27**	12.4	7	22	20	14	8	0.89	1
Inch	**RSE 12080R08**	●	* **80**	68	55	50	**25.4**	12.4	7	22	20	14	8	0.9	1

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure Cream
		Handle Grip	Bit	
BFTX04095IP	3.0	HPS1015	TRB15IP	SUMI-P

Identification Code

RSE Series Code | **12** Insert Size | **050** Max. Dia. | **R** Feed Direction | **S** Metric Bore | **05** Number of Teeth

Insert

Dimensions (mm)

Grade Classification		Coated Carbide		
Process	High-speed/Light Cutting	M S	M S	
	Medium Cutting	M S	M S	M S
	Roughing			M S

Cat. No.	New XCS2000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Fig
RPHT1204M0EN-G	●	●	●	12	4.76	1
RPMT1204M0EN-G	●	●	●	12	4.76	2
RDMT1204M0EN-G	●	●	●	12	4.76	3

Fig 1 4-cornered

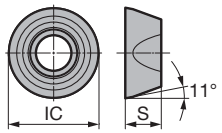


Fig 2 8-cornered

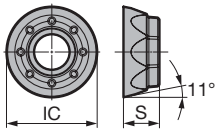
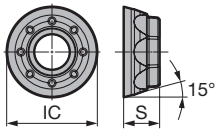


Fig 3 8-cornered



Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
S	Exotic Alloy	Heat-Resistant Alloy	—	G	25 - **35** - 50	0.15 - **0.25** - 0.35	XCS2000/ACS2500/ACS3000
		Ti Alloy	—	G	30 - **60** - 90	0.15 - **0.25** - 0.35	ACS2500/ACS3000
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200HB	G	115 - **145** - 175	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000
		SUS403 and Others (Martensitic/Hardened)	240HB	G	105 - **130** - 155	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000
		SUS304, SUS316 (Austenitic)	180HB	G	125 - **155** - 190	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000

Note
- The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
- For groove milling, calculate the feed rate at around 70% of the above values.
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

RSE 10000E type

M Stainless Steel S Exotic Alloy

New

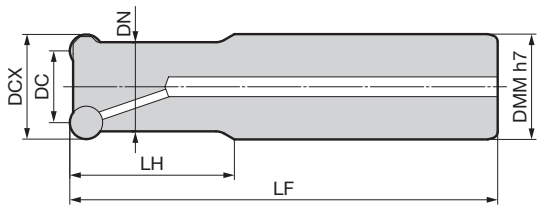
Rake Angle		
Rake	Radial	0°
Angle	Axial	4°

5mm 4-cornered

1.4mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
RSE 10025E02	●	**25**	15	25	20.3	50	130	2	0.4	1
10025E03	●	**25**	15	25	20.3	50	130	3	0.39	1
10032E03	●	**32**	22	32	27.1	50	130	3	0.68	1
10032E04	●	**32**	22	32	27.1	50	130	4	0.67	1

Inserts are sold separately.

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX03584IP	3.0	TRDR15IP	SUMI-P

Identification Code

RSE **10** **032** **E** **03**

Series Code	Insert Size	Max. Dia.	Shank type	Number of Teeth

Insert

Dimensions (mm)

Grade Classification		Coated Carbide		
Process	High-speed/Light Cutting	MS	MS	
	Medium Cutting	MS	MS	MS
	Roughing			MS

Cat. No.	New XCS2000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Fig
RPHT10T3M0EN-G	●	●	●	10	3.97	1
RPMT10T3M0EN-G	●	●	●	10	3.97	2
RDMT10T3M0EN-G	●	●	●	10	3.97	3

Fig 1 4-cornered

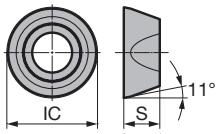


Fig 2 8-cornered

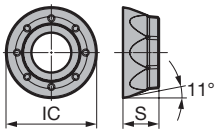
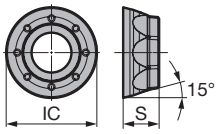


Fig 3 8-cornered



Recommended Cutting Conditions

ISO	Work Material		Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Grade
S	Exotic Alloy	Heat-Resistant Alloy	—	G	25 - **35** - 50	0.15 - **0.25** - 0.35	XCS2000/ACS2500/ACS3000
		Ti Alloy	—	G	30 - **60** - 90	0.15 - **0.25** - 0.35	ACS2500/ACS3000
M	Stainless Steel	SUS430 and Others (Martensitic/Ferritic)	200HB	G	115 - **145** - 175	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000
		SUS403 and Others (Martensitic/Hardened)	240HB	G	105 - **130** - 155	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000
		SUS304, SUS316 (Austenitic)	180HB	G	125 - **155** - 190	0.15 - **0.30** - 0.45	XCS2000/ACS2500/ACS3000

Note · The recommended cutting conditions may not be practical depending on the operating conditions (e.g. machine, work material shape, clamping system).
· For groove milling, calculate the feed rate at around 70% of the above values.
· The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

MEMO

RSX series

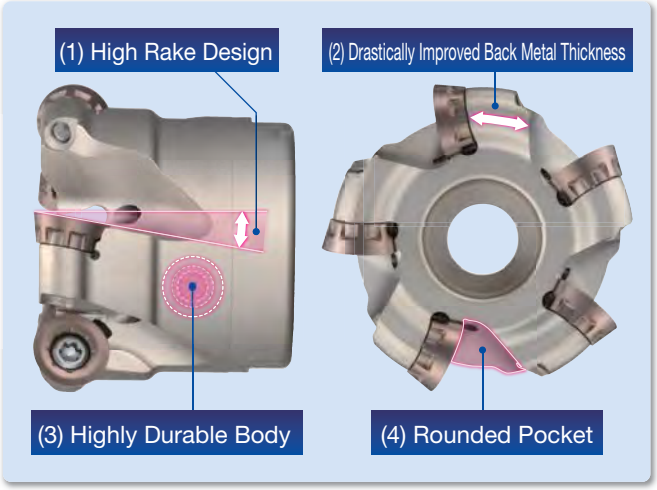
VIDEO OF CUTTING

■ Features

SEC-Wave Radius Mill RSX type is a radius cutter that enables stable machining even when using machines with low clamp rigidity, thanks to a body design that achieves excellent sharpness and rigidity.
Lineup of ACM series grades for stainless steel/exotic alloy, ACP200 grade for steel and ACK300 grade for cast iron to suit a wide range of work materials.
RSX08000 and RSX20000 lineup extended to support a wide range of machining.

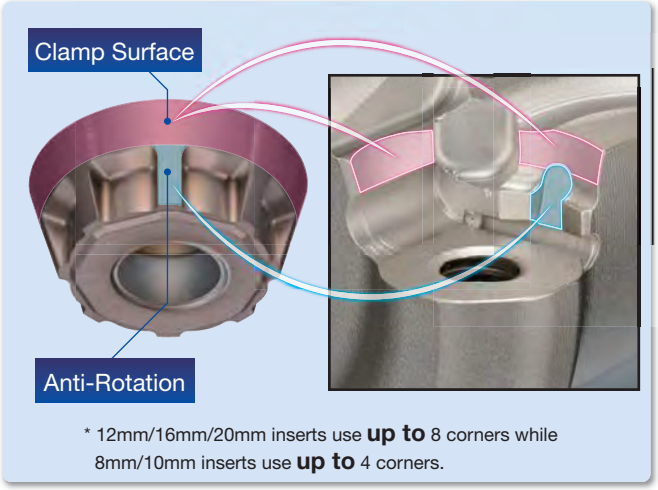
■ Low Cutting Force, Low-vibration Design

Achieves low cutting force, low-vibration machining thanks to ultra-high-rake design and high-rigidity body design.



■ Excellent Operability

Enables easy corner control with high accuracy and operability by employing our proprietary positioning mechanism.



* 12mm/16mm/20mm inserts use **up to** 8 corners while 8mm/10mm inserts use **up to** 4 corners.

■ Product Range

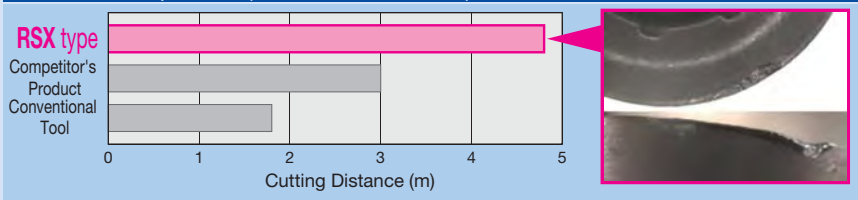
Type	Cat. No.	Description	Max. Diameter (mm) ø20	ø25	ø32	ø40	ø50	ø52	ø63	ø66	ø80	ø100	ø125	ø160	Shape
Shell	RSX1000RS	Standard Pitch				4	5	5							
	RSXF1000RS	Extra Fine Pitch				5	6	6							
	RSX12000RS	Standard Pitch				3	4	4	5	6	6	6			
	RSX12000R (Inch)	Standard Pitch									6	6			
	RSXF12000RS	Extra Fine Pitch				4	5	5	6	7	7	10			
	RSXF12000R (Inch)	Extra Fine Pitch									7	10			
	RSX16000RS	Standard Pitch							4		5	6	6		
	RSX16000R (Inch)	Standard Pitch									5	6	6		
	RSXF16000RS	Extra Fine Pitch							5		6	7	8	10	
	RSXF16000R (Inch)	Extra Fine Pitch									6	7	8	10	
	RSX20000RS	Standard Pitch									4	5	6	7	
	RSX20000R (Inch)	Standard Pitch									4	5	6	7	
	RSXF20000RS	Extra Fine Pitch									5	6	7	9	
	RSXF20000R (Inch)	Extra Fine Pitch									5	6	7	9	
Shank	RSX08000ES	Standard Pitch	2	3											
	RSXF08000ES	Extra Fine Pitch	3	4											
	RSX10000ES	Standard Pitch		2	3										
	RSXF10000ES	Extra Fine Pitch		3	4										
	RSX12000ES	Standard Pitch			2										
	RSXF12000ES	Extra Fine Pitch			3										
Modular	RSX08000M	Standard Pitch	2	3	4										
	RSXF08000M	Extra Fine Pitch	3	4	5										
	RSX10000M	Standard Pitch		2	3										
	RSXF10000M	Extra Fine Pitch		3	4										
	RSX12000M	Standard Pitch			2	3									
	RSXF12000M	Extra Fine Pitch			3	4									

Number in ●●● shows the number of teeth (Inch) Inch Bore

Modular type ☞ H271

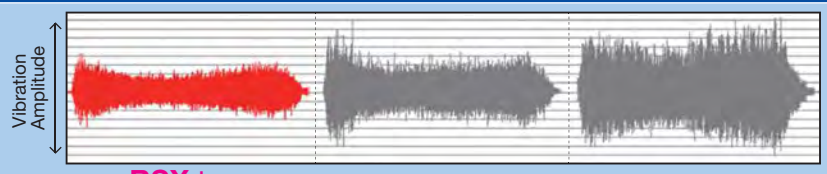
■ Cutting Performance

Tool Life Comparison (Fracture Resistance)



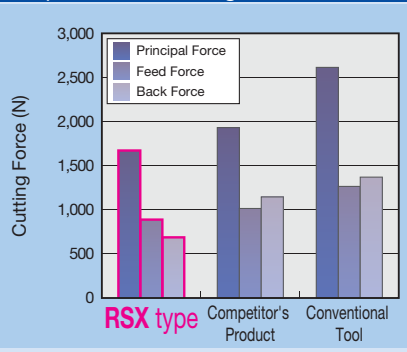
Achieves a tool life approximately 1.6 times longer than that of our competitors' products.

Cutting Vibration Comparison



Reduced by approximately 15% compared to competitors' products.

Comparison of Cutting Force



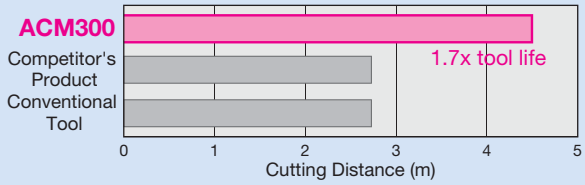
Work material: SUS304 Tool: ø50

Cutting Conditions: VC = 200m/min, fz = 0.5mm/t

ap = 2.0mm, ae = 10.0mm Wet

■ Long, Stable Tool Life

Tool Life (SUS304 Machining)

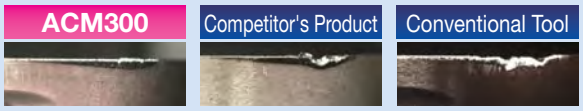


Cutter: RSXF12050RS

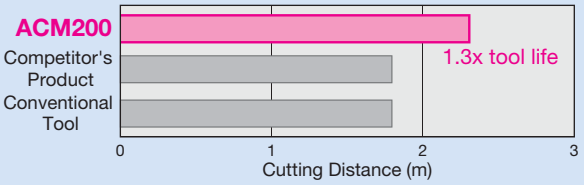
Insert: RDET1204M0EN-G

Cutting Conditions: vc = 200m/min, fz = 0.5mm/t, ap = 2mm, ae = 10mm Wet

(Cutting Distance: 2.7m)



Tool Life (SUS630-H900 Machining)

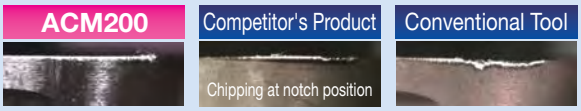


Cutter: RSXF12050RS

Insert: RDET1204M0EN-G

Cutting Conditions: vc = 150m/min, fz = 0.3mm/t, ap = 2mm, ae = 10mm Wet

(Cutting Distance: 1.8m)

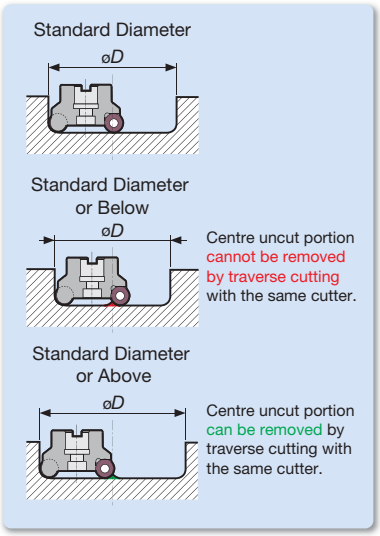


RSX series

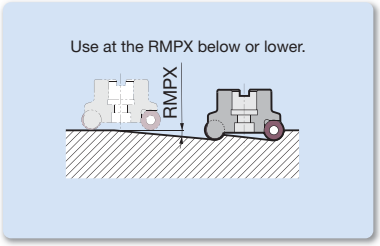
■ Machining Applications

Can be used for various types of high-efficiency machining such as deep shoulder milling of molds, ramping, and helical milling.

Precautions for Helical Milling



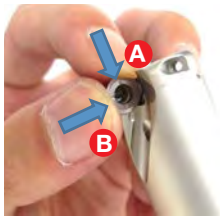
Precautions for Ramping



Recommended Values for Helical Milling and Ramping

Insert Cat. No.	Helical Milling (mm)				Ramping
	Max. Dia. DCX	Machining Dia. øD			Maximum Ramp Angle RMPX
		Min. Dia.	Standard Diameter	Max. Dia.	
RDET08...	**20**	27.6	32	39	12°00'
	25	37.0	42	49	7°15'
	32	50.8	56	63	4°45'
RDET10...	**25**	33.0	40	49	10°30'
	32	46.0	54	63	6°45'
	40	62.0	70	79	4°30'
	50	82.0	90	99	3°15'
	52	86.0	94	103	3°10'
RDET12...	**32**	41.5	52	63	12°30'
	40	57.5	68	79	8°00'
	50	77.5	88	99	5°30'
	52	81.5	92	103	5°15'
	63	103.5	114	125	4°00'
	66	109.5	120	131	3°45'
	80	137.5	148	159	2°50'
	100	177.5	188	199	2°10'
RDET16...	**63**	96.0	110	125	6°00'
	80	130.0	144	159	4°10'
	100	170.0	184	199	3°00'
	125	220.0	234	249	2°20'
RDET20...	**80**	122.0	140	159	4°15'
	100	162.0	180	199	3°00'
	125	212.0	230	249	2°00'
	160	282.0	300	319	1°15'

■ Precautions for Mounting Inserts



Hold down the insert from the Ⓐ and Ⓑ directions and fasten the screw.

Align either insert rake face marking position Ⓒ with the marking position Ⓓ on the body.

RSX(F) 10000RS type

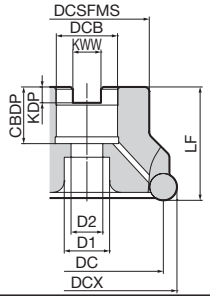
P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Rake Angle	Radial	-5°
	Axial	10°

5mm

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSX 10040RS**	●	**40**	30	34	40	**16**	8.4	5.6	18	14	9	4	0.2	1
	10050RS	●	**50**	40	40	40	**22**	10.4	6.3	20	18	11	5	0.3	1
	10052RS	●	**52**	42	40	40	**22**	10.4	6.3	20	18	11	5	0.4	1

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSXF 10040RS**	●	**40**	30	34	40	**16**	8.4	5.6	18	14	9	5	0.2	1
	10050RS	●	**50**	40	40	40	**22**	10.4	6.3	20	18	11	6	0.3	1
	10052RS	●	**52**	42	40	40	**22**	10.4	6.3	20	18	11	6	0.3	1

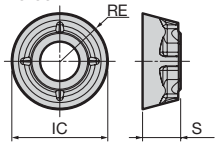
Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Insert

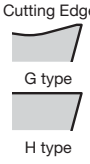
Dimensions (mm)

Grade Classification		Coated Carbide								
Process	High-speed/Light Cutting			MS	MS					
	General-purpose	PM		MS	MS	MS				
	Roughing	PM	K			MS				
Cat. No.		ACP200	ACK300	ACM100	ACM200	ACM300	Inscribed Circle IC	Corner Radius RE	Thickness S	Fig
RDET 10T3M0EN-G		●	●	●	●	●	10	5.0	3.97	1
10T3M0EN-H		●	●	●	●	●	10	5.0	3.97	1

Fig 1 4-cornered



● Cross Section of Cutting Edge



Precautions for Mounting Inserts H196

Identification Code

RSX Series Code | **F** Extra Fine Pitch | **10** Insert Size | **040** Max. Dia. | **R** Feed Direction | **S** Metric Bore

Parts

Flat Insert Screw		Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
BFTX03584IP	3.0	HPS1015	TRB15IP	SUMI-P

Recommended Cutting Conditions

ISO	Work Material			Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel			180 to 280 HB	100-**160**-200	0.20-**0.40**-0.60	ACP200
	Alloy Steel			180 to 280 HB	100-**140**-180	0.20-**0.30**-0.40	ACP200
M	Stainless Steel	Cr-based	Ferritic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
			Martensitic	200 to 330HB	80-**120**-180	0.15-**0.25**-0.35	ACM300
		Cr-Ni-based	Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
			Duplex (Austenitic/Ferritic)	230 to 270HB	80-**120**-180	0.15-**0.25**-0.35	ACM200
			Deposition Hardened Structures	330HB	60-**100**-160	0.15-**0.25**-0.35	ACM200
K	Cast Iron			250HB	80-**120**-160	0.10-**0.30**-0.40	ACK300
S	Heat-Resistant Alloy		Ni-based Material	250 to 350HB	20- **30** - 40	0.10-**0.20**-0.30	ACM100 ACM200
	Titanium		Pure Titanium (99.5%)	(Rm400)	60- **80** -100	0.10-**0.20**-0.30	
			$\alpha + \beta$ Alloy	(Rm1050)	40- **50** - 60	0.10-**0.20**-0.30	

Note The cutting conditions are guidelines. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

RSX(F) 12000R(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-5°
	Axial	10°

6mm 4-cornered | 1.6mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1

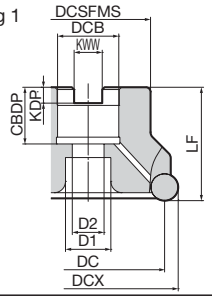


Fig 2

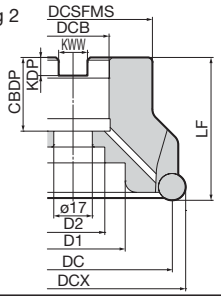
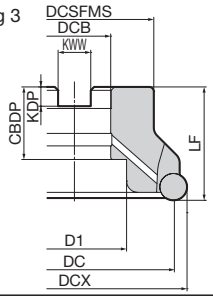


Fig 3



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSX 12040RS**	●	**40**	28	32	40	**16**	8.4	5.6	18	13.5	9	3	0.2	1
	12050RS	●	**50**	38	40	40	**22**	10.4	6.3	20	18	11	4	0.3	1
	12052RS	●	**52**	40	40	40	**22**	10.4	6.3	20	18	11	4	0.3	1
	12063RS	●	**63**	51	40	40	**22**	10.4	6.3	20	18	11	5	0.4	1
	12066RS	●	**66**	54	55	50	**27**	12.4	7.0	25	20	14	6	0.7	1
	12080RS	●	***80**	68	55	50	**27**	12.4	7.0	25	20	14	6	1.0	1
	12100RS	●	**100**	88	70	50	**32**	14.4	8.5	32	46	—	6	1.4	3
Inch	**RSX 12080R**	●	***80**	68	55	50	**25.4**	9.5	6.0	25	20	13	6	1.0	1
	12100R	●	***100**	88	70	63	**31.75**	12.7	8.0	32.5	46	28	6	1.9	2

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSXF 12040RS**	●	**40**	28	32	40	**16**	8.4	5.6	18	13.5	9	4	0.2	1
	12050RS	●	**50**	38	40	40	**22**	10.4	6.3	20	18	11	5	0.3	1
	12052RS	●	**52**	40	40	40	**22**	10.4	6.3	20	18	11	5	0.3	1
	12063RS	●	**63**	51	40	40	**22**	10.4	6.3	20	18	11	6	0.4	1
	12066RS	●	**66**	54	55	50	**27**	12.4	7.0	25	20	14	7	0.7	1
	12080RS	●	***80**	68	55	50	**27**	12.4	7.0	25	20	14	7	0.9	1
	12100RS	●	**100**	88	70	50	**32**	14.4	8.5	32	46	—	10	1.3	3
Inch	**RSXF 12080R**	●	***80**	68	55	50	**25.4**	9.5	6.0	25	20	13	7	1.0	1
	12100R	●	***100**	88	70	63	**31.75**	12.7	8.0	32.5	46	28	10	1.8	2

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

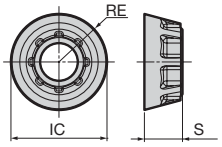
Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

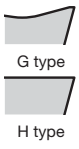
Dimensions (mm)

Grade Classification		Coated Carbide								
Process	High-speed/Light Cutting			MS	MS					
	General-purpose	PM		MS	MS	MS				
	Roughing	PM	K			MS				
Cat. No.		ACP200	ACK300	ACM100	ACM200	ACM300	Inscribed Circle IC	Corner Radius RE	Thickness S	Fig
RDET 1204M0EN-G		●	●	●	●	●	12	6.0	4.76	1
1204M0EN-H		●	●	●	●	●	12	6.0	4.76	1

Fig 1 8-cornered



● Cross Section of Cutting Edge



Precautions for Mounting Inserts H196

Identification Code

RSX **F** **12** **040** **R** **S**

Series Code	Extra Fine Pitch	Insert Size	Max. Dia.	Feed Direction	Metric Bore

Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure Cream
		Handle Grip	Bit	
BFTX0409IP	3.0	HPS1015	TRB15IP	SUMI-P

Recommended Cutting Conditions

ISO	Work Material			Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel			180 to 280 HB	100-**160**-200	0.20-**0.40**-0.60	ACP200
	Alloy Steel			180 to 280 HB	100-**140**-180	0.20-**0.30**-0.40	ACP200
M	Stainless Steel	Cr-based	Ferritic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
			Martensitic	200 to 330HB	80-**120**-180	0.15-**0.25**-0.35	ACM300
		Cr-Ni-based	Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
			Duplex (Austenitic/Ferritic)	230 to 270HB	80-**120**-180	0.15-**0.25**-0.35	ACM200
			Deposition Hardened Structures	330HB	60-**100**-160	0.15-**0.25**-0.35	ACM200
K	Cast Iron			250HB	80-**120**-160	0.10-**0.30**-0.40	ACK300
S	Heat-Resistant Alloy		Ni-based Material	250 to 350HB	20-**30**-40	0.10-**0.20**-0.30	ACM100 ACM200
	Titanium		Pure Titanium (99.5%)	(Rm400)	60-**80**-100	0.10-**0.20**-0.30	
			$\alpha + \beta$ Alloy	(Rm1050)	40-**50**-60	0.10-**0.20**-0.30	

Note The cutting conditions are guidelines. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

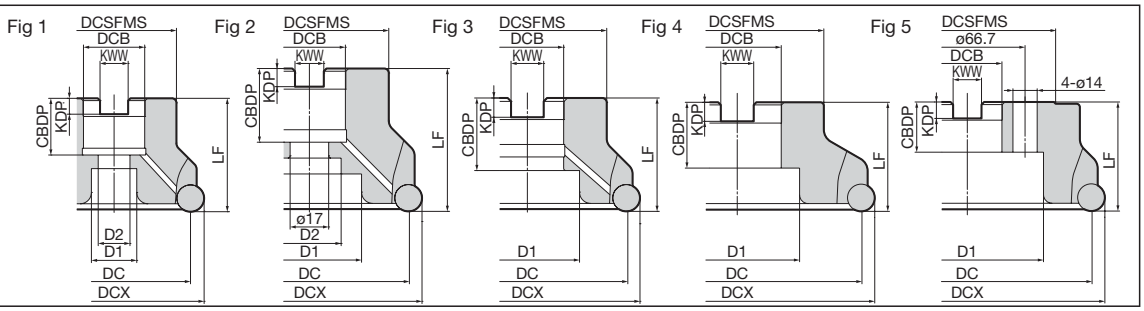
RSX(F) 16000R(S) type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-5°
	Axial	10°

8mm 4-cornered | 2.2mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSX 16063RS**	●	**63**	47	50	40	**22**	10.4	6.3	20	18	11	4	0.5	1
	16080RS	●	***80**	64	55	50	**27**	12.4	7.0	25	20	14	5	0.9	1
	16100RS	●	**100**	84	70	50	**32**	14.4	8.5	32	46	—	6	1.3	3
	16125RS	●	**125**	109	80	63	**40**	16.4	9.5	29	52	29	6	2.6	1
Inch	**RSX 16080R**	●	***80**	64	55	50	**25.4**	9.5	6.0	25	20	13	5	0.9	1
	16100R	●	***100**	84	70	63	**31.75**	12.7	8.0	32.5	46	28	6	1.8	2
	16125R	●	**125**	109	80	63	**38.1**	15.9	10.0	35.5	55	30	6	2.7	1

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSXF 16063RS**	●	**63**	47	50	40	**22**	10.4	6.3	20	18	11	5	0.4	1
	16080RS	●	***80**	64	55	50	**27**	12.4	7.0	25	20	14	6	0.8	1
	16100RS	●	**100**	84	70	50	**32**	14.4	8.5	32	46	—	7	1.3	3
	16125RS	●	**125**	109	80	63	**40**	16.4	9.5	29	52	29	8	2.5	1
	16160RS		**160**	144	130	63	**40**	16.4	9.5	29	88	—	10	4.8	5
Inch	**RSXF 16080R**	●	***80**	64	55	50	**25.4**	9.5	6.0	25	20	13	6	0.8	1
	16100R	●	***100**	84	70	63	**31.75**	12.7	8.0	32.5	46	28	7	1.7	2
	16125R	●	**125**	109	80	63	**38.1**	15.9	10.0	35.5	55	30	8	2.6	1
	16160R		**160**	144	100	63	**50.8**	19.1	11.0	38	72	—	10	4.3	4

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

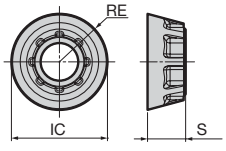
Insert

Dimensions (mm)

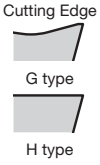
Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting			MS	MS	
	General-purpose	PM		MS	MS	MS
	Roughing	PM	K			MS

Cat. No.	ACP200	ACK300	ACM100	ACM200	ACM300	Inscribed Circle IC	Corner Radius RE	Thickness S	Fig
RDET 1606M0EN-G	●	●	●	●	●	16	8.0	6.5	1
1606M0EN-H	●	●	●	●	●	16	8.0	6.5	1

Fig 1 8-cornered



● Cross Section of Cutting Edge



Precautions for Mounting Inserts H196

Identification Code

RSX **F** **16** **063** **R** **S**

RSX	F	16	063	R	S
Series Code	Extra Fine Pitch	Insert Size	Max. Dia.	Feed Direction	Metric Bore

Parts

Applicable Cutter	Flat Insert Screw		Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
RSX(F) 16063RS RSX(F) 16080R(S) Up to RSX(F) 16125R(S)	BFTX0511IP	5.0	—	HPL2025	TRB20IP	SUMI-P
RSXF 16160R(S)	BFTX0511IP	5.0	TRDR20IP	—	—	SUMI-P

Recommended Cutting Conditions

ISO	Work Material		Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel		180 to 280 HB	100-**160**-200	0.20-**0.40**-0.60	ACP200
	Alloy Steel		180 to 280 HB	100-**140**-180	0.20-**0.30**-0.40	ACP200
M	Stainless Steel Cr-based	Ferritic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
		Martensitic	200 to 330HB	80-**120**-180	0.15-**0.25**-0.35	ACM300
		Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
	Cr-Ni-based	Duplex (Austenitic/Ferritic)	230 to 270HB	80-**120**-180	0.15-**0.25**-0.35	ACM200
		Deposition Hardened Structures	330HB	60-**100**-160	0.15-**0.25**-0.35	ACM200
K	Cast Iron		250HB	80-**120**-160	0.10-**0.30**-0.40	ACK300
S	Titanium	Heat-Resistant Alloy: Ni-based Material	250 to 350HB	20- **30** - 40	0.10-**0.20**-0.30	ACM100 ACM200
		Pure Titanium (99.5%)	(Rm400)	60- **80** -100	0.10-**0.20**-0.30	
		$\alpha + \beta$ Alloy	(Rm1050)	40- **50** - 60	0.10-**0.20**-0.30	

Note The cutting conditions are guidelines. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

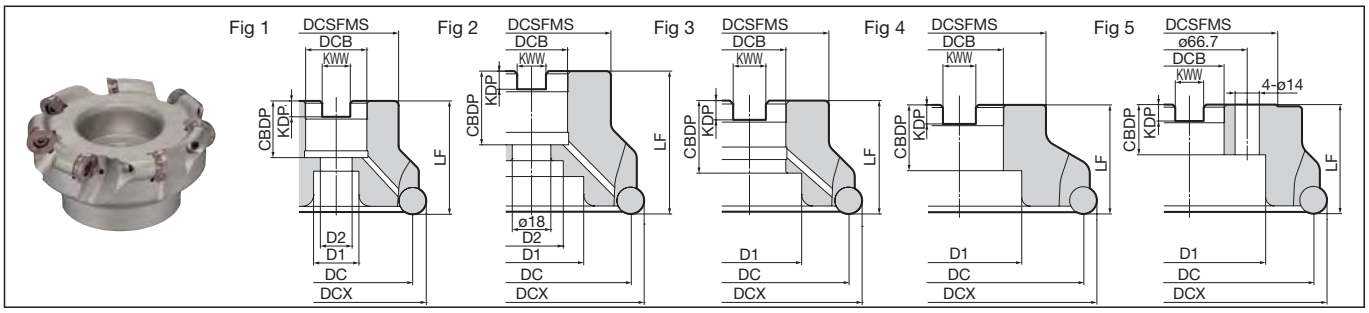
RSX(F) 20000R(S) type

P Steel M Stainless Steel K Cast Iron S Exotic Alloy

Rake Angle		
Radial	-5°	
Axial	10°	

10mm 4-cornered | 2.7mm 8-cornered

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSX 20080RS**	●	*80	60	55	50	**27**	12.4	7	22	20	14	4	0.9	1
	20100RS	●	**100**	80	70	50	**32**	14.4	8	32	46	—	5	1.8	3
	20125RS	●	**125**	105	80	63	**40**	16.4	9	29	52	29	6	2.6	1
	20160RS	●	**160**	140	130	63	**40**	16.4	9	29	90	—	7	4.7	5
Inch	**RSX 20080R**	●	*80	60	55	50	**25.4**	9.5	6	25	20	14	4	0.9	1
	20100R	●	**100**	80	70	63	**31.75**	12.7	8	32	46	27	5	1.8	2
	20125R	●	**125**	105	80	63	**38.1**	15.9	10	35.5	55	30	6	2.6	1
	20160R	●	**160**	140	130	63	**50.8**	19.1	11	38	72	—	7	4.2	4

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**RSXF 20080RS**	●	*80	60	55	50	**27**	12.4	7	22	20	14	5	0.9	1
	20100RS	●	**100**	80	70	50	**32**	14.4	8	32	46	—	6	1.8	3
	20125RS	●	**125**	105	80	63	**40**	16.4	9	29	52	29	7	2.6	1
	20160RS	●	**160**	140	130	63	**40**	16.4	9	29	90	—	9	4.6	5
Inch	**RSXF 20080R**	●	*80	60	55	50	**25.4**	9.5	6	25	20	14	5	0.9	1
	20100R	●	*100	80	70	63	**31.75**	12.7	8	32	46	27	6	1.8	2
	20125R	●	**125**	105	80	63	**38.1**	15.9	10	35.5	55	30	7	2.6	1
	20160R	●	**160**	140	130	63	**50.8**	19.1	11	38	72	—	9	4.1	4

Inserts are sold separately. Take note of the cutter mounting size (DCB) when selecting a cutter.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

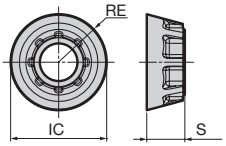
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

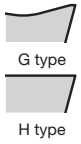
Dimensions (mm)

Grade Classification		Coated Carbide								
Process	High-speed/Light Cutting			MS	MS					
	General-purpose	PM		MS	MS	MS				
	Roughing	PM	K			MS				
Cat. No.		ACP200	ACK300	ACM100	ACM200	ACM300	Inscribed Circle IC	Corner Radius RE	Thickness S	Fig
RDET 2006M0EN-G		●	●	●	●	●	20	10.0	6.5	1
2006M0EN-H		●	●	●	●	●	20	10.0	6.5	1

Fig 1 8-cornered



● Cross Section of Cutting Edge



Precautions for Mounting Inserts H196

Identification Code

RSX **F** **20** **080** **R** **S**

Series Code	Extra Fine Pitch	Insert Size	Max. Dia.	Feed Direction	Metric Bore

Parts

Cat. No.	Flat Insert Screw		Integrated Wrench	Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
		N·m				
RSX(F) 20080R(S) Up to RSX(F) 20125R(S)	BFTX0615IP	5.0	—	HPL2025	TRB25IP	SUMI-P
RSX(F) 20160R(S)	BFTX0615IP	5.0	TRDR25IP	—	—	SUMI-P

Recommended Cutting Conditions

ISO	Work Material		Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel		180 to 280 HB	100-**160**-200	0.20-**0.40**-0.60	ACP200
	Alloy Steel		180 to 280 HB	100-**140**-180	0.20-**0.30**-0.40	ACP200
M	Stainless Steel Cr-based	Ferritic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
		Martensitic	200 to 330HB	80-**120**-180	0.15-**0.25**-0.35	ACM300
	Stainless Steel Cr-Ni-based	Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
		Duplex (Austenitic/Ferritic)	230 to 270HB	80-**120**-180	0.15-**0.25**-0.35	ACM200
		Deposition Hardened Structures	330HB	60-**100**-160	0.15-**0.25**-0.35	ACM200
K	Cast Iron		250HB	80-**120**-160	0.10-**0.30**-0.40	ACK300
S	Heat-Resistant Alloy	Ni-based Material	250 to 350HB	20-**30**-40	0.10-**0.20**-0.30	ACM100 ACM200
	Titanium	Pure Titanium (99.5%)	(Rm400)	60-**80**-100	0.10-**0.20**-0.30	
		$\alpha + \beta$ Alloy	(Rm1050)	40-**50**-60	0.10-**0.20**-0.30	

Note The cutting conditions are guidelines. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

RSX(F) 08000ES/10000ES/12000ES type

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-5° to -8°
	Axial	10°

4mm (08000ES) | 5mm (10000ES) | 6mm 4-cornered (12000ES) | 1.6mm 8-cornered (12000ES)

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

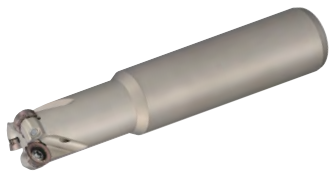
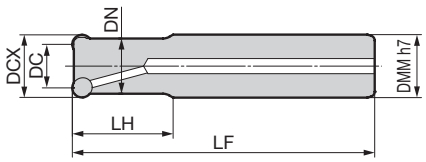


Fig 1



Body (Standard Pitch) Applicable Insert IC = 8mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
RSX 08020ES	●	**20**	12	20	16.9	30	100	2	0.3	1
08025ES	●	**25**	17	25	21.9	40	120	3	0.4	1

Body (Extra Fine Pitch) Applicable Insert IC = 8mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
RSXF 08020ES	●	**20**	12	20	16.9	30	100	3	0.3	1
08025ES	●	**25**	12	25	21.9	40	120	4	0.4	1

Body (Standard Pitch) Applicable Insert IC = 10mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
RSX 10025ES	●	**25**	15	25	20.3	50	130	2	0.4	1
10032ES	●	**32**	22	32	27.1	50	130	3	0.7	1

Body (Extra Fine Pitch) Applicable Insert IC = 10mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
RSXF 10025ES	●	**25**	15	25	20.3	50	130	3	0.4	1
10032ES	●	**32**	22	32	27.1	50	130	4	0.7	1

Body (Standard Pitch) Applicable Insert IC = 12mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
RSX 12032ES	●	**32**	20	32	25.6	50	130	2	0.7	1

Body (Extra Fine Pitch) Applicable Insert IC = 12mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
RSXF 12032ES	●	**32**	20	32	25.6	50	130	3	0.7	1

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting			M S	M S	
	General-purpose	P M		M S	M S	M S
	Roughing	P M	K			M S

Cat. No.	ACP200	ACK300	ACM100	ACM200	ACM300	Inscribed Circle IC	Corner Radius RE	Thickness S	Applicable Cutter	Fig
RDET 0803M0EN-G	●	●	●	●	●	8	4.0	3.18	RSX(F)08000ES	1
0803M0EN-H	●	●	●	●	●					1
RDET 10T3M0EN-G	●	●	●	●	●	10	5.0	3.97	RSX(F)10000RS/ES	1
10T3M0EN-H	●	●	●	●	●					1
RDET 1204M0EN-G	●	●	●	●	●	12	6.0	4.76	RSX(F)12000RS/ES	2
1204M0EN-H	●	●	●	●	●					2

Fig 1 4-cornered

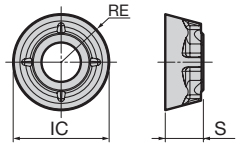
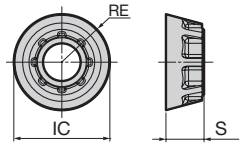


Fig 2 8-cornered



● Cross Section of Cutting Edge

Precautions for Mounting Inserts H196

Identification Code

RSX **F** **10** **025** **ES**

RSX	F	10	025	ES
Series Code	Extra Fine Pitch	Insert Size	Max. Dia.	Shank type

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
RSX(F)08000ES	BFTX02506IP	1.5	TRDR08IP	SUMI-P
RSX(F)10000ES	BFTX03584IP	3.0	TRDR15IP	SUMI-P
RSX(F)12000ES	BFTX0409IP	3.0	TRDR15IP	SUMI-P

Recommended Cutting Conditions

ISO	Work Material		Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel		180 to 280 HB	100-**160**-200	0.20-**0.40**-0.60	ACP200
	Alloy Steel		180 to 280 HB	100-**140**-180	0.20-**0.30**-0.40	ACP200
M	Stainless Steel Cr-based	Ferritic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
		Martensitic	200 to 330HB	80-**120**-180	0.15-**0.25**-0.35	ACM300
		Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
	Cr-Ni-based	Duplex (Austenitic/Ferritic)	230 to 270HB	80-**120**-180	0.15-**0.25**-0.35	ACM200
		Deposition Hardened Structures	330HB	60-**100**-160	0.15-**0.25**-0.35	ACM200
K	Cast Iron		250HB	80-**120**-160	0.10-**0.30**-0.40	ACK300
S	Heat-Resistant Alloy	Ni-based Material	250 to 350HB	20-**30**-40	0.10-**0.20**-0.30	ACM100 ACM200
	Titanium	Pure Titanium (99.5%)	(Rm400)	60-**80**-100	0.10-**0.20**-0.30	
		$\alpha + \beta$ Alloy	(Rm1050)	40-**50**-60	0.10-**0.20**-0.30	

Note The cutting conditions are guidelines. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WRCX series

■ Features

The SEC-Wave Radius Mill WRCX type is a versatile, high-efficiency cutter that is suited to various types of machining such as deep shoulder milling of molds, ramping, and helical milling.
Furthermore, a wide selection of chipbreakers and grades covers a wide range of work materials, from steel to non-ferrous metals.

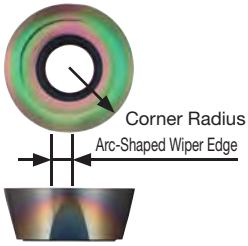
- Durable body with special surface treatment offers significantly improved tool life and reliability.
- Superb chatter resistance with anti-vibration edge design.
- All sizes come with coolant holes preventing chip build-up and jamming.
- Sturdy screw clamp with Torx Plus screw insert mounting ensures stable machining.

■ Abundant Insert Series

- In addition to conventional WRC type inserts, the new lineup includes non-ferrous metal inserts and surfing inserts

Non-Ferrous Metal Inserts QPET ○○○○○○ PPFR-S

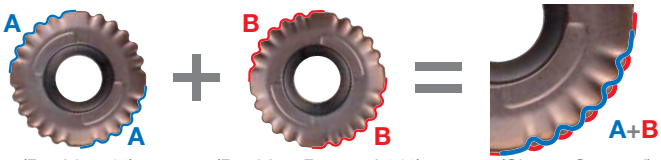
- Good surface roughness with arc-shaped wiper edge
- Sharp corners
- Four-cornered insert



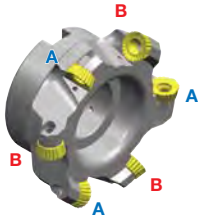
Surfing Insert QPMT ○○○○○○ PPER-R

- Cutting edges feature unique rippled design
- Four-cornered insert
- Low cutting force, enabling use on low-rigidity machines as well

* Use in combinations that alternate cutting edge A and cutting edge B.
(Only usable on cutters with an even number of cutting edges)



(Position 0°) (Position Rotated 90°) (Shape Created)



Shift the phase in 90° increments to mount inserts

■ Product Range

	Cat. No.	Max. Dia. (mm)	Number of Teeth
Shell type	**WRCX(F) 12000R(S)**	ø40 to ø80	4-6
	WRCX(F) 16000R(S)	ø63 to ø100	3-6
	WRCX 20000R(S)	ø125 to ø160	5-6
Shank type	**WRCX 08000E**	ø20 to ø25	2-3
	WRCX 10000E	ø25 to ø32	2-3
	WRCX 16000E	ø40 to ø50	2-3
Modular type	**WRCX 08000M**	ø20 to ø25	2-3
	WRCX 10000M	ø25 to ø32	2-3
	WRCX 12000M	ø40	4

Modular type H272

● Maximum Allowable Spindle Speed when Milling Non-Ferrous Metal (Unit: min⁻¹)

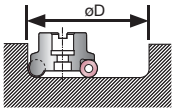
Max. Dia. DCX(mm)	Insert Cat. No.		
	QPET10·····-S	QPET12·····-S	QPET16·····-S
25	28,000		
32	25,000		
40		22,000	15,000
50		20,000	14,000
63		18,000	13,000
80		16,000	12,000
100			10,000

* The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force. Even if the speed used is within the maximum allowable spindle speeds, abnormal vibrations may occur due to machine rigidity or other factors. Therefore, it is advisable to start operation at half the maximum allowable spindle speed and increase the speed gradually while checking for abnormalities.

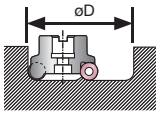
■ Usage Precautions

● Precautions for Helical Milling

Standard Diameter

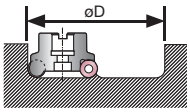


Standard Diameter or Below



Centre uncut portion cannot be removed by traverse cutting with the same cutter.

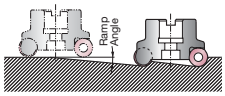
Standard Diameter or Above



Centre uncut portion can be removed by traverse cutting with the same cutter.

● Precautions for Ramping

- Use at the RMPX below or lower.



● Recommended Values for Helical Milling and Ramping

Insert Cat. No.	Helical Milling (Dimensions in mm)				Ramping
	Max. Dia. DCX	Machining Dia. øD			Maximum Ramp Angle
		Min. Dia.	Standard Diameter	Max. Dia.	RMPX(max)
QP□□08○○○○	**20**	25	32	39	13°
	25	35	42	49	8°20'
QP□□10○○○○	**25**	32	40	48	13°10'
	32	46	54	62	8°
QP□□12○○○○	**40**	57	68	79	10°
	50	77	88	99	7°30'
	63	103	114	125	5°10'
	80	137	148	159	3°50'
QP□□16○○○○	**40**	49	64	79	19°30'
	50	69	84	99	12°
	63	95	110	125	8°
	80	129	144	159	5°30'
	100	169	184	199	4°
QP□□20○○○○	**125**	212	230	248	3°30'
	160	282	300	318	2°30'

WRCX(F)12000 type

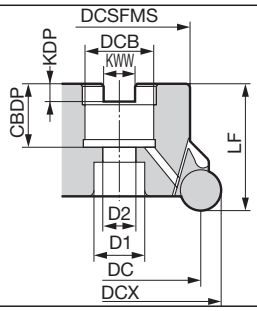
P Steel | M Stainless Steel | K Cast Iron | N Aluminum Alloy

Rake Angle	Radial	0°
	Axial	-3°

6mm

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WRCX 12040RS**	●	**40**	28	36	40	**16**	8.4	5.6	18	14	9	4	0.2	1
	12050RS	●	**50**	38	40	40	**22**	10.4	6.3	20	18	11	4	0.2	1
	12063RS	●	**63**	51	40	40	**22**	10.4	6.3	20	18	11	5	0.4	1
	12080RS	●	**80**	68	55	50	**27**	12.4	7.0	25	20	13.5	6	0.9	1

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WRCXF 12050RS**	●	**50**	38	40	40	**22**	10.4	6.3	20	18	11	5	0.2	1
	12063RS	●	**63**	51	40	40	**22**	10.4	6.3	20	18	11	6	0.4	1

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Insert (Common)

Dimensions (mm)

Grade Classification		Coated Carbide					Cermented Carbide	DLC				
Process	High-speed/Light Cutting	P			K		K	N				
	General-purpose		PM	PM	K			N				
	Roughing		PM	PM		K						
Applications	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Inscribed Circle IC	Corner Radius RE	Thickness S	Fig
General-purpose	**QPMT 120440 PPEN**		●	●	●	●	—	—	12	4.0	4.76	1
	120440 PPEN-H*		●	●	●	●	—	—	12	4.0	4.76	1
Non-Ferrous Metals	**QPET 120460 PPFR-S**	—	—	—	—	—	●	●	12	6.0	4.76	2
Surfing	**QPMT 120460 PPER-R**		●	●			—	—	12	6.0	4.76	3

*: -H at the end indicates strong edged.

Fig 1 8-cornered

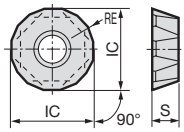


Fig 2 Non-Ferrous Metals 4 corners

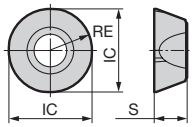
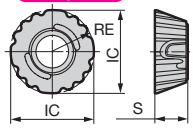


Fig 3 Surfing Insert 4 corners



Parts

Flat Insert Screw		Detachable Wrench		Anti-seizure Cream
		Handle Grip	Bit	
BFTX0409IP	3.0	HPS1015	TRB15IP	SUMI-P

Recommended Cutting Conditions

Diameter ø40 to ø80mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	100-**160**-200	0.20-**0.40**-0.60	ACP200
	Alloy Steel	180 to 280HB	100-**140**-180	0.20-**0.30**-0.40	ACP200
M	Stainless Steel	—	80-**120**-160	0.10-**0.20**-0.30	ACP300
K	Cast Iron	250HB	80-**120**-160	0.10-**0.20**-0.40	ACK200
N	Non-Ferrous Metals	—	200-**500**-1,000	0.10-**0.30**-0.40	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WRCX(F) 16000R(S) type

P Steel | M Stainless Steel | K Cast Iron | N Aluminum Alloy

Rake Angle	Radial	0°
	Axial	-3°

8mm

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1

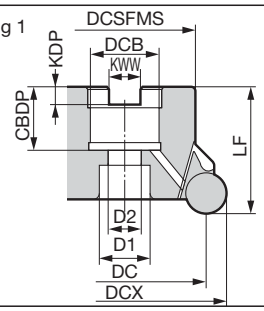
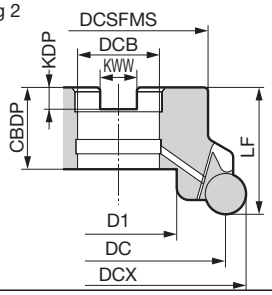


Fig 2



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WRCX 16063RS**	●	**63**	47	50	40	**22**	10.4	6.3	20	18	11	3	0.4	1
	16080RS	●	***80**	64	55	50	**27**	12.4	7.0	25	20	13.5	4	0.8	1
	16100RS	●	**100**	84	70	50	**32**	14.4	8.5	32	46	—	5	1.2	2
Inch	**16080R**	●	**80**	64	55	50	**25.4**	9.5	6.0	25	20	13	4	0.8	1
	16100R	●	**100**	84	70	63	**31.75**	12.7	8.0	32	46	17	5	1.4	1

Inserts are sold separately.

Body (Extra Fine Pitch)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WRCXF 16063RS**	●	**63**	47	50	40	**22**	10.4	6.3	20	18	11	4	0.4	1
	16080RS	●	***80**	64	55	50	**27**	12.4	7.0	25	20	13.5	5	0.7	1
	16100RS	●	**100**	84	70	50	**32**	14.4	8.5	32	46	—	6	1.2	2

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (ø80: M12 x 30 to 35mm, ø100: M16 x 40 to 45mm).

Insert

Dimensions (mm)

Grade Classification		Coated Carbide					Cemented Carbide	DLC				
Process	High-speed/Light Cutting	P			K		K N	N				
	General-purpose		PM	PM	K			N				
	Roughing		PM	PM		K						
Applications	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Inscribed Circle IC	Corner Radius RE	Thickness S	Fig
General-purpose	**QPMT 160660 PPEN**		●	●	●	●	—	—	16	6.0	6.5	1
	160660 PPEN-H*1		●	●	●	●	—	—	16	6.0	6.5	1
Anti-Vibration*2	**QPMT 160608 PPEN**		●	●	●	●	—	—	16	0.8	6.5	1
	160608 PPEN-CP		●	●	●	●	—	—	16	0.8	6.5	2
Non-Ferrous Metals	**QPET 160680 PPFR-S**	—	—	—	—	—	●	●	16	8.0	6.5	3
Surfing	**QPMT 160680 PPER-R**		●	●			—	—	16	8.0	6.5	4

Fig 1 8-cornered

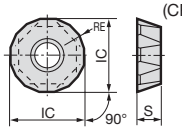


Fig 2 (CP type)

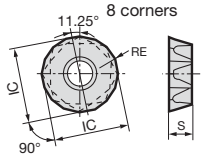


Fig 3 Non-Ferrous Metals 4 corners

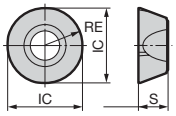
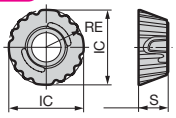


Fig 4 Surfing Insert 4 corners



*1: -H at the end indicates strong cutting edge type.

*2: For insert arrangements in anti-vibration applications, place the 08 type and 08-CP type alternately.
Only even numbers of cutting edges are usable.

Parts

Flat Insert Screw		Detachable Wrench: Handle Grip	Detachable Wrench: Bit	Anti-seizure Cream
BFTX0511IP	5.0	HPL2025	TRB20IP	SUMI-P

Recommended Cutting Conditions

Diameter ø40 to ø80mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	100- **160** -200	0.20- **0.40** -0.60	ACP200
	Alloy Steel	180 to 280HB	100- **140** -180	0.20- **0.30** -0.40	ACP200
M	Stainless Steel	—	80- **120** -160	0.10- **0.20** -0.30	ACP300
K	Cast Iron	250HB	80- **120** -160	0.10- **0.20** -0.40	ACK200
N	Non-Ferrous Metals	—	200- **500** -1,000	0.10- **0.30** -0.40	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Diameter ø100 to ø160mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	150- **200** -250	0.30- **0.40** -0.60	ACP200
	Alloy Steel	180 to 280HB	100- **160** -200	0.10- **0.30** -0.50	ACP200
M	Stainless Steel	—	160- **180** -200	0.15- **0.20** -0.30	ACP300
K	Cast Iron	250HB	100- **150** -200	0.10- **0.15** -0.20	ACK200
N	Non-Ferrous Metals	—	200- **500** -1,000	0.20- **0.40** -0.60	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

WRCX 20000R type

P Steel | M Stainless Steel | K Cast Iron | N Aluminum Alloy

Rake Angle	Radial	0°
	Axial	-3°

10mm

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1

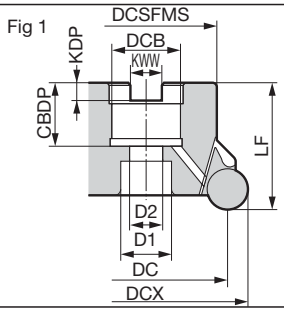
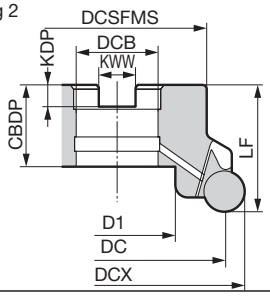


Fig 2



Body

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Inch	**WRCX 20125R**	●	**125**	105	80	63	**38.1**	15.9	10.0	35.5	55	30	5	2.3	1
	20160R	●	**160**	140	100	63	**50.8**	19.1	11.0	41.5	72	—	6	4.0	2

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide					Cermented Carbide	DLC				
Process	High-speed/Light Cutting	P			K		KN	N				
	General-purpose		PM	PM	K			N				
	Roughing		PM	PM		K						
Applications	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Inscribed Circle IC	Corner Radius RE	Thickness S	Fig
General-purpose	**QPMT 200670 PPEN**		●	●	●	●	—	—	20	7.0	6.5	1
	200670 PPEN-H[*1]		●	●	●	●	—	—	20	7.0	6.5	1
Anti-Vibration[*2]	**QPMT 200608 PPEN**		●	●	●	●	—	—	20	0.8	6.5	1
	200608 PPEN-CP		●	●	●	●	—	—	20	0.8	6.5	2
Surfing	**QPMT 2006100 PPER-R**		●	●			—	—	20	10.0	6.5	3

Fig 1 8-cornered

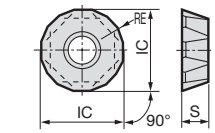


Fig 2 (CP type)

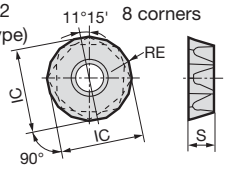
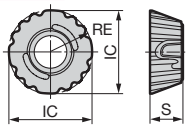


Fig 3 Surfing Insert 4 corners



*1: -H at the end indicates strong cutting edge type.

*2: For insert arrangements in anti-vibration applications, place the 08 type and 08-CP type alternately.

Parts

Applicable Cutter	Flat Insert Screw		Integrated Wrench	Detachable Wrench		Anti-seizure Cream
		N·m		Handle Grip	Bit	
WRCX 20125R	BFTX0615IP	7.5	—	HPL2025	TRB25IP	SUMI-P
WRCX 20160R	BFTX0615IP	7.5	TRDR25IP	—	—	

Recommended Cutting Conditions

Diameter ø100 to ø160mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	150-**200**-250	0.30-**0.40**-0.60	ACP200
	Alloy Steel	180 to 280HB	100-**160**-200	0.10-**0.30**-0.50	ACP200
M	Stainless Steel	—	160-**180**-200	0.15-**0.20**-0.30	ACP300
K	Cast Iron	250HB	100-**150**-200	0.10-**0.15**-0.20	ACK200

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WRCX 08000E(S/M)/10000E(S/M)/16000E(S/M) type

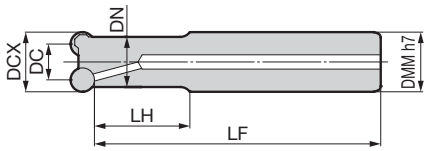
P Steel | M Stainless Steel | K Cast Iron | N Aluminum Alloy

Rake Angle	Radial	-3 to 0°
	Axial	-3°

4mm (08000E type) | 5mm (10000E type) | 8mm (16000E type)

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Body (Applicable Insert IC = 8mm type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WRCX 08020ES	●	**20**	12	20	18	50	130	2	0.2	1
08020EM	●	**20**	12	20	18	100	180	2	0.3	1
08020EL		**20**	12	20	18	130	250	2	0.5	1
WRCX 08025ES	●	**25**	17	25	21	50	130	3	0.4	1
08025EM	●	**25**	17	25	21	100	180	3	0.5	1
08025EL		**25**	17	25	21	130	250	3	0.7	1

Body (Applicable Insert IC = 10mm type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WRCX 10025ES	●	**25**	15	25	21	50	130	2	0.4	1
10025EM	●	**25**	15	25	21	100	180	2	0.5	1
10025EL		**25**	15	25	21	130	250	2	0.7	1
WRCX 10032ES	●	**32**	22	32	28	50	130	3	0.7	1
10032EM	●	**32**	22	32	28	120	200	3	1.0	1
10032EL		**32**	22	32	28	180	300	3	1.5	1

Body (Applicable Insert IC = 16mm type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank DMM	Diameter DN	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WRCX 16040ES	●	**40**	24	32	31.3	50	170	2	0.9	1
16040EM	●	**40**	24	32	31.3	50	250	2	1.4	1
WRCX 16050ES	●	**50**	34	32	40.8	50	170	3	1.0	1
16050EM	●	**50**	34	32	40.8	50	250	3	1.5	1

Inserts are sold separately.

Parts

Applicable Cutter	Flat Insert Screw		Wrench	Anti-seizure Cream
WRCX08000E type	BFTX02506IP	1.5	TRDR08IP	SUMI-P
WRCX10000E type	BFTX03584IP	3.0	TRDR15IP	
WRCX16000E type	BFTX0511IP	5.0	TRDR20IP	

Recommended Cutting Conditions

Diameter ø20 to ø32mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	80-**120**-160	0.10-**0.30**-0.40	ACP200
	Alloy Steel	180 to 280HB	60-**100**-140	0.10-**0.20**-0.30	ACP200
M	Stainless Steel	—	60-**100**-120	0.10-**0.15**-0.20	ACP300
K	Cast Iron	250HB	60-**80**-120	0.10-**0.20**-0.30	ACK200
N	Non-Ferrous Alloys	—	200-**500**-1,000	0.10-**0.20**-0.30	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Diameter ø40 to ø50mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	100-**160**-200	0.20-**0.40**-0.60	ACP200
	Alloy Steel	180 to 280HB	100-**140**-180	0.20-**0.30**-0.40	ACP200
M	Stainless Steel	—	80-**120**-160	0.10-**0.20**-0.30	ACP300
K	Cast Iron	250HB	80-**120**-160	0.10-**0.20**-0.40	ACK200
N	Non-Ferrous Alloys	—	200-**500**-1,000	0.10-**0.30**-0.40	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide					Cermet Carbide	DLC
Process	High-speed/Light Cutting	P			K		K N	N
	General-purpose		P M	P M	K			N
	Roughing		P M	P M		K		

Applications	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Inscribed Circle IC	Corner Radius RE	Thickness S	Fig	Applicable Cutter
General-purpose	**QPMT 080330 PPEN**		●	●	●	●	—	—	8	3.0	3.18	1	WRCX08000E type
	080330 PPEN-H[*1]		●	●	●	●	—	—	8	3.0	3.18	1	
	QPMT 10T335 PPEN		●	●	●	●	—	—	10	3.5	3.97	1	WRCX10000E type
	10T335 PPEN-H[*1]		●	●	●	●	—	—	10	3.5	3.97	1	
	QPMT 160660 PPEN		●	●	●	●	—	—	16	6.0	6.5	1	WRCX16000E type
	160660 PPEN-H[*1]		●	●	●	●	—	—	16	6.0	6.5	1	
Anti-Vibration[*2]	**QPMT 160608 PPEN**		●	●	●	●	—	—	16	0.8	6.5	1	WRCX16000E type
	160608 PPEN-CP		●	●	●	●	—	—	16	0.8	6.5	2	
Non-Ferrous Metals	**QPET 10T350 PPFR-S**	—	—	—	—	—	●	●	10	5.0	3.97	3	WRCX10000E type
	QPET 160680 PPFR-S	—	—	—	—	—	●	●	16	8.0	6.5	3	WRCX16000E type
Surfing	**QPMT 160680 PPER-R**		●	●			—	—	16	8.0	6.5	4	WRCX16000E type

Fig 1
8 corners

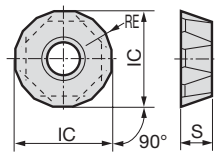


Fig 2
(CP type)
8 corners

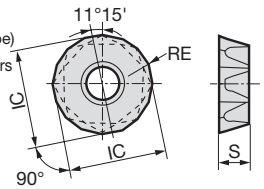


Fig 3
Non-Ferrous Metals
4 corners

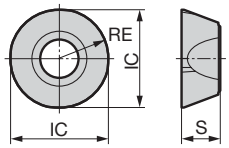
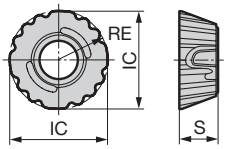


Fig 4
Surfing Insert
4 corners



*1: -H at the end indicates strong cutting edge type. *2: For insert arrangements in anti-vibration applications, place the 08 type and 08-CP type alternately.

N·m Recommended Tightening Torque (N·m)

WBMR series

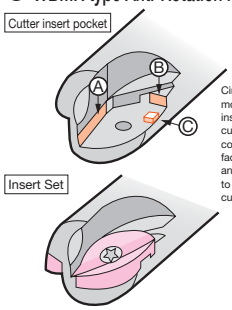
■ Features

A lineup of ø20 to ø50mm ballnose shank type cutter models for 3D profile roughing of die molds and machine parts.

● WBMR2000/2000L (ø20 to ø50mm)

- Wave-shaped high rake angle insert design achieves a sharp cutting edge and low cutting force
- Economical M-class insert with strong cutting edge
- Anti-rotation guides prevent insert from slipping during machining
- Integrated insert shape is used for large diameter cutters (ø40, ø50), enabling easier tool management

● WBMR type Anti-Rotation Mechanism



Circumferential movement of the insert caused by cutting force is controlled by guide faces Ⓐ and Ⓑ and anti-rotation Ⓒ to allow stable cutting.

WBMR2000
(ø20 to ø50mm)

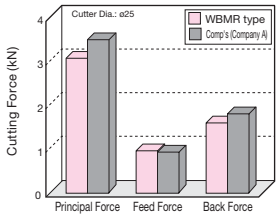
(WBMR2250S)

WBMR2000L
(ø20 to ø50mm)

(WBMR2500SL)

■ Performance

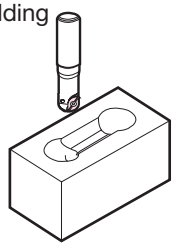
● Cutting Force



Work Material: S50C
Cutting Conditions
(Shoulder Milling, Down Cutting)
vc = 200m/min
fz = 0.15mm/t
ap = 5mm
ae = 5mm

■ Application Examples

● Cold Molding Die (SKD11)



Evaluation
Evaluation of flank wear width after continuous cutting for seven hours was less than competitor's product. Stable cutting was observed.
WBMR2200S (ø20)
Insert Grade: ACZ350
Cutting Conditions
n = 2,200min⁻¹
vf = 500mm/min
ap 0.3 to 2mm
Non-water-soluble Cutting Oil

■ Product Range

Type	Cat. No.	Dia. (mm) ø20	ø25	ø30	ø40	ø50
Shank	WBMR 2000S	●	●	●	●	●
	WBMR 2000M	●	●	●	●	●
	WBMR 2000L	●	●	●	●	●
	WBMR 2000S(M/L)-C					●
	WBMR 2000SL	●	●	●	●	●
	WBMR 2000ML	●	●	●	●	●
	WBMR 2000LL	●	●	●	●	●
	WBMR 2000S(M/L)L-C					●

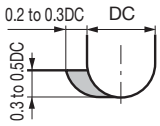
■ Parts

Applicable Cutter ☐ indicates S/M/L type	Part Name	Short Edge type For Tip Insert	Long Edge type (-L) For Tip Insert	Long Edge type (-L) For Peripheral Cutting Edge	Anti-seizure Cream
WBMR2200☐(L)	Flat Insert Screw	BFTX0307N (N·m) 2.0			SUMI-P
	Wrench	TRX10			
WBMR2250☐(L)	Flat Insert Screw	BFTX0409N (N·m) 3.0			
	Wrench	TRD15			
WBMR2300☐(L)	Flat Insert Screw	BFTX0511N (N·m) 5.0		BFTX0407N (N·m) 3.0	
	Wrench	TRD20		TRD15	
WBMR2400☐(L)	Flat Insert Screw	BFTX0619N (N·m) 7.5		BFTX0409N (N·m) 3.0	
	Wrench	TRD25		TRD15	
WBMR2500☐(L) WBMR2500☐(L)-C	Flat Insert Screw	BFTX0619N (N·m) 7.5		BFTX0409N (N·m) 3.0	
	Wrench	TRD25		TRD15	

Recommended Cutting Conditions

(A) Tip insert only

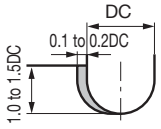
ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	100-**150**-200	0.10-**0.20**-0.30	ACP200
P	Alloy Steel	180 to 280HB	70-**100**-120	0.10-**0.20**-0.30	ACP200
M	Stainless Steel, Die Steel	—	50-**80**-100	0.10-**0.15**-0.20	ACP300
K	Cast Iron	250HB	100-**120**-150	0.20-**0.30**-0.40	ACK300



Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

(B) Tip insert and peripheral cutting edge

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	80-**120**-150	0.10-**0.20**-0.30	ACP200
P	Alloy Steel	180 to 280HB	50-**80**-100	0.10-**0.20**-0.30	ACP200
M	Stainless Steel, Die Steel	—	40-**60**-80	0.10-**0.15**-0.20	ACP300
K	Cast Iron	250HB	80-**100**-120	0.20-**0.30**-0.40	ACK300



Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

WBMR 2000 type

P Steel | M Stainless Steel | K Cast Iron

Rake Angle	Radial	—
	Axial	-10°

ap 20 to 47 mm

Groove Milling | Profiling

Fig 1

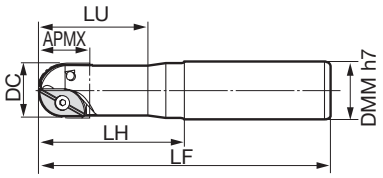
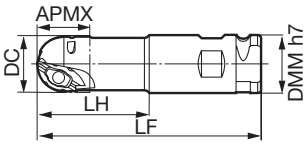


Fig 2



Note: Fig 2 shows a combination clamped shank diagram (2500☐-C).

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Length LU	Overall Length LF	Fig
WBMR 2200S	●	**20**	20	25	60	40	140	1
2200M	●	**20**	20	25	60	40	200	1
2200L	●	**20**	20	25	80	40	250	1
WBMR 2250S	●	**25**	23	32	70	50	150	1
2250M	●	**25**	23	32	73	50	220	1
2250L	●	**25**	23	32	100	50	300	1
WBMR 2300S	●	**30**	28	32	80	60	160	1
2300M	●	**30**	28	32	85	60	240	1
2300L	●	**30**	28	32	120	60	350	1
WBMR 2400S	●	**40**	35	42	100	—	200	1
2400M	●	**40**	35	42	180	—	280	1
2400L	●	**40**	35	42	250	—	350	1
WBMR 2500S	●	**50**	47	42	100	—	200	1
2500M	●	**50**	47	42	180	—	280	1
2500L	●	**50**	47	42	250	—	350	1
WBMR 2500S-C	●	**50**	47	50.8	100	—	200	2
2500M-C	●	**50**	47	50.8	180	—	280	2
2500L-C	●	**50**	47	50.8	250	—	350	2

Inserts are sold separately.

Insert

Dimensions (mm)

Fig 1

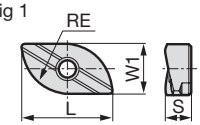


Fig 2

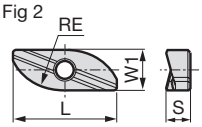


Fig 3

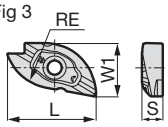
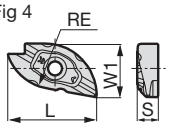


Fig 4



Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	P			K	
	General-purpose		PM	PM	K	
	Roughing		PM	PM		K

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	Length L	Width W1	Thickness S	Corner Radius RE	Fig	Applicable Milling Cutters	Remarks
ZNMT 1804100-C		●	●		●	18.00	9.76	4.76	10	1	WBMR 2200☐	· Tip inserts are used in combination according to Fig 1 & 2.
2004100-S		●	●		●	20.00	7.50	4.37	10	2		
ZNMT 2205125-C		●	●		●	22.50	12.20	5.70	12.5	1	WBMR 2250☐	· Tip inserts are used in combination according to Fig 1 & 2.
2305125-S		●	●		●	23.00	9.38	5.56	12.5	2		
ZNMT 2706150-C		●	●		●	27.00	14.64	6.75	15	1	WBMR 2300☐	· Tip inserts are used in combination according to Fig 1 & 2.
2806150-S		●	●		●	28.00	11.25	6.35	15	2		
ZNMT 3608200		●	●		●	36.00	19.50	8.65	20	3	WBMR 2400☐	· Use two of the items shown in Fig 3 as the tip inserts.
ZNMT 4310250		●	●		●	43.00	25.70	10.15	25	3	WBMR 2500☐	· Use two of the items shown in Fig 3 or Fig 4 (nicked) as the tip inserts.
4310250-N		●	●		●	43.00	25.70	10.15	25	4		

Parts H207 | Recommended Cutting Conditions H207

WBMR 2000L type

P Steel | M Stainless Steel | K Cast Iron

Rake Angle	Radial	—
	Axial	-10°

30 to 69mm

Groove Milling | Profiling

Fig 1

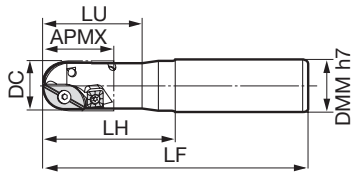
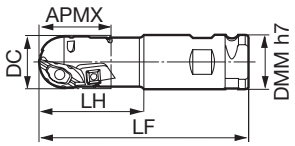


Fig 2



Note: Fig 2 shows a combination clamped shank diagram (2500□-C).

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Length LU	Overall Length LF	Fig
WBMR 2200SL	●	**20**	30	25	60	40	140	1
2200ML	●	**20**	30	25	60	40	200	1
2200LL	●	**20**	30	25	80	40	250	1
WBMR 2250SL	●	**25**	38	32	70	50	150	1
2250ML	●	**25**	38	32	73	50	220	1
2250LL	●	**25**	38	32	100	50	300	1
WBMR 2300SL	●	**30**	42	32	80	60	160	1
2300ML	●	**30**	42	32	85	60	240	1
2300LL	●	**30**	42	32	120	60	350	1
WBMR 2400SL	●	**40**	50	42	100	—	200	1
2400ML	●	**40**	50	42	180	—	280	1
2400LL	●	**40**	50	42	250	—	350	1
WBMR 2500SL	●	**50**	69	42	100	—	200	1
2500ML	●	**50**	69	42	180	—	280	1
2500LL	●	**50**	69	42	250	—	350	1
WBMR 2500SL-C	●	**50**	69	50.8	100	—	200	2
2500ML-C	●	**50**	69	50.8	180	—	280	2
2500LL-C	●	**50**	69	50.8	250	—	350	2

Inserts are sold separately.

Insert

Dimensions (mm)

Fig 1

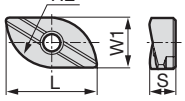


Fig 2

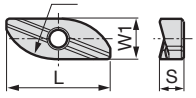


Fig 3

Fig 4

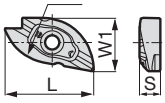
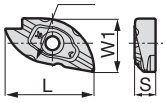


Fig 5

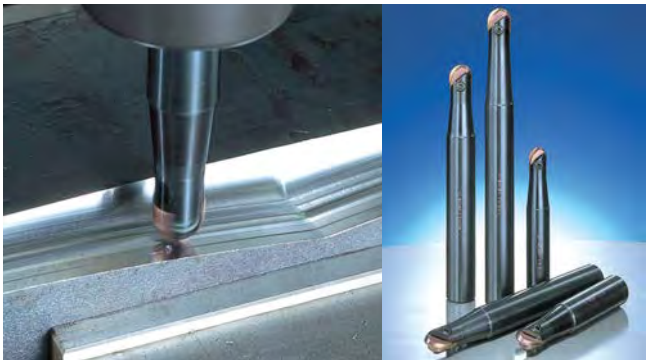


Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	P			K	
	General-purpose		P M	P M	K	
	Roughing		P M	P M		K

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	Length L	Width W1	Thickness S	Corner Radius RE	Fig	Applicable Milling Cutters	Remarks
ZNMT 1804100-C		●	●		●	18.00	9.76	4.76	10	1	WBMR 2200□L	· Tip inserts are used in combination according to Fig 1 & 2. · Peripheral cutting edge (Fig 3) for 2200□L only.
2004100-S		●	●		●	20.00	7.50	4.37	10	2		
SPMT 070308		●	●		●	7.94	—	3.18	—	3		
ZNMT 2205125-C		●	●		●	22.50	12.20	5.70	12.5	1	WBMR 2250□L	· Tip inserts are used in combination according to Fig 1 & 2. · Peripheral cutting edge (Fig 3) for 2250□L only.
2305125-S		●	●		●	23.00	9.38	5.56	12.5	2		
SPMT 09T308		●	●		●	9.53	—	3.97	—	3		
ZNMT 2706150-C		●	●		●	27.00	14.64	6.75	15	1	WBMR 2300□L	· Tip inserts are used in combination according to Fig 1 & 2. · Peripheral cutting edge (Fig 3) for 2300□L only.
2806150-S		●	●		●	28.00	11.25	6.35	15	2		
SPMT 09T308		●	●		●	9.53	—	3.97	—	3		
ZNMT 3608200		●	●		●	36.00	19.50	8.65	20	4	WBMR 2400□L	· Use two of the items shown in Fig 4 as the tip inserts. · Peripheral cutting edge (Fig 3) for 2400□L only.
SPMT 09T308		●	●		●	9.53	—	3.97	—	3		
ZNMT 4310250		●	●		●	43.00	25.70	10.15	25	4	WBMR 2500□L	· Use two of the items shown in Fig 4 or Fig 5 (nicked) as the tip inserts. · Peripheral cutting edge (Fig 3) for 2500□L only.
4310250-N		●	●		●	43.00	25.70	10.15	25	5		
SPMT 120408						12.70	—	4.76	—	3		

Parts H207 | Recommended Cutting Conditions H207

WBMF series



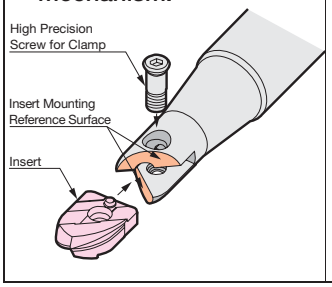
■ Features

A lineup of ø10 to ø30mm ballnose shank type cutter models for 3D profile finishing of die molds and machine parts.

● WBMF1000 type (ø10 to ø30mm)

- Simple but precise clamping design.
- Original large helix angle design.
- Sharp cutting edge that produces good surface roughness.
- Excellent wear resistance with Super ZX Coat.

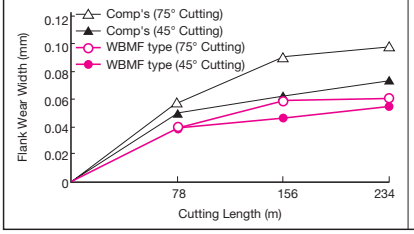
● WBMF type clamp mechanism.



WBMF1000

■ Performance

● Insert Life



Results
WBMF type outperforms competitors' products in most processes including plan profiling, with better wear resistance.

Work Material: S50C
Machining Method: Ramping (45°, 75°)
Cutting Conditions
n = 2,000min^{-1}
vf = 2,000mm/min
ap = 0.3mm
pf = 0.6mm
Dry

■ Product Range

Type	Cat. No.	Dia. (mm)					
		ø10	ø12	ø16	ø20	ø25	ø30
Shank	**WBMF 1000S**	●	●	●	●	●	●
	WBMF 1000M	●	●	●	●	●	●
	WBMF 1000L	●	●	●	●	●	●

WBMF 1000 type

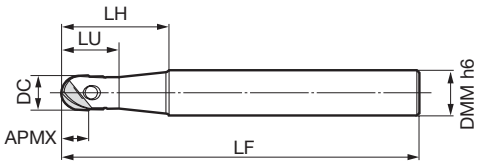
P Steel

Rake Angle	Radial	—
	Axial	0°

0.1 to 0.4mm

Groove Milling Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Shank DMM	Head LH	Length LU	Overall Length LF	Fig
WBMF 1100S	●	**10**	9	16	30	17	100	1
1100M	●	**10**	9	16	35	17	130	1
1100L	●	**10**	9	16	50	17	180	1
1120S	●	**12**	10.5	16	40	19.5	110	1
1120M	●	**12**	10.5	16	40	19.5	150	1
1120L	●	**12**	10.5	16	60	19.5	200	1
1160S	●	**16**	12	20	50	25.5	130	1
1160M	●	**16**	12	20	50	25.5	180	1
1160L	●	**16**	12	20	70	25.5	220	1
1200S	●	**20**	15	25	60	32	140	1
1200M	●	**20**	15	25	60	32	200	1
1200L	●	**20**	15	25	80	32	250	1
1250S	●	**25**	18.5	32	70	36	150	1
1250M	●	**25**	18.5	32	73	36	220	1
1250L	●	**25**	18.5	32	100	36	300	1
1300S	●	**30**	22.5	32	80	43	160	1
1300M	●	**30**	22.5	32	85	43	240	1
1300L	●	**30**	22.5	32	120	43	350	1

Inserts are sold separately.

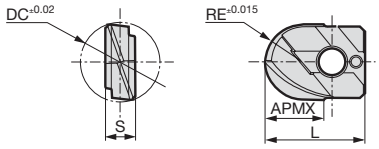
Insert

Dimensions (mm)

Grade Classification		Coated Carbide
Process	High-speed/Light Cutting	P
	General-purpose	
	Roughing	

Cat. No.	ACZ120	Dia. DC	Length L	Max. Depth of Cut APMX	Thickness S	Corner Radius RE	Applicable Cutter	Fig
ZPGU 1551050	●	10	15.6	9	5.1	5.0	WBMF 1100	1
1856060	●	12	18	10.5	5.6	6.0	WBMF 1120	1
2061080	●	16	20.5	12	6.1	8.0	WBMF 1160	1
2471100	●	20	24.5	15	7.1	10.0	WBMF 1200	1
2876125	●	25	28.5	18.5	7.6	12.5	WBMF 1250	1
3486150	●	30	34.4	22.5	8.6	15.0	WBMF 1300	1

Fig 1



Parts

Applicable Cutter	Precision Screw	N·m	Wrench	Anti-seizure Cream
WBMF1100	BFTG0408F	3.0	TRD15	SUMI-P
WBMF1120	BFTG0409F			
WBMF1160	BFTG0513F	5.0	TRD20	
WBMF1200	BFTG0617F	7.5	TRD25	
WBMF1250	BFTG0621F			
WBMF1300	BFTG0825F			

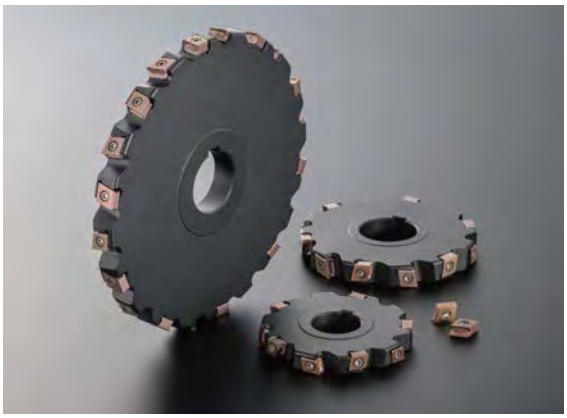
Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	200-**250**-300	0.10-**0.20**-0.30	ACZ120
	Alloy Steel	180 to 280HB	100-**150**-200	0.10-**0.20**-0.30	ACZ120

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

TGC series

New



■ Features

● Side Cutter Suitable For A Variety Of Applications
Made-to-order bodies possible with cutting width of 17mm and up.
Suitable for various applications such as groove milling and shoulder milling.

● Realises Low Resistance and Low Vibration Milling
Design emphasizes cutting edge sharpness with +10° inclination angle.
Excellent cutting edge sharpness suppresses chatter to enable stable machining.

● Excellent Machined Surface Quality
Proprietary insert array design minimizes joint steps at the groove bottom for excellent machining quality.

● Neutral-handed 4-cornered Insert
Easy management with neutral-handed insert design that eliminates the need to align right-hand and left-hand inserts.

■ Product Range (Body)

Body: Made-to-order (custom design)

Standard design

Multi-stage design

Insert Cat. No.	Width of Cut CW (mm)						
	17	21	22	22.8	23.7	24.6	Over 24.6
TGCX130704PNEN-G	Standard design						Multi-stage design
TGCX130708PNEN-G	Standard design					Multi-stage design	
TGCX130712PNEN-G	Standard design				Multi-stage design		
TGCX130716PNEN-G	Standard design			Multi-stage design			
TGCX130720PNEN-G	Standard design		Multi-stage design				

Standard design CW upper limit value varies with insert.

■ Product Range (Insert)

Cat. No.	Corner Radius RE (mm)				
	0.4	0.8	1.2	1.6	2.0
TGCX1307○○PNEN-G	●	●	●	●	●

● mark: Standard stocked item

■ Chipbreaker

Work Material	P Steel, M stainless steel, K cast iron
Applications	General-purpose to roughing
Chipbreaker	**G type**
	TGCX 13
Cutting Edge Cross Section	

■ Suitable for Various Applications

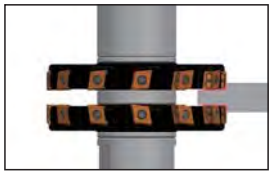
Groove Milling

Standard disc shape

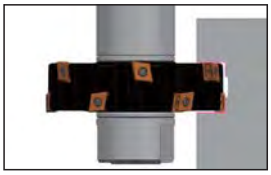
Shoulder Milling

Back Spot Facing

Width Setting



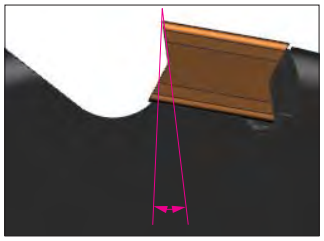
Double-Sided Machining



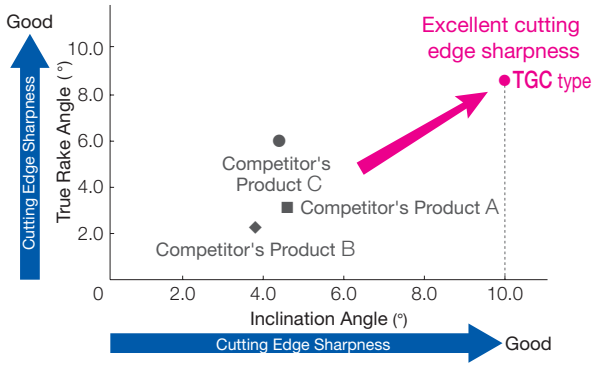
■ Sharp Edge Design

Design emphasizes cutting edge sharpness with +10° inclination angle.
Excellent cutting edge sharpness suppresses chatter to enable stable machining.

Inclination Angle

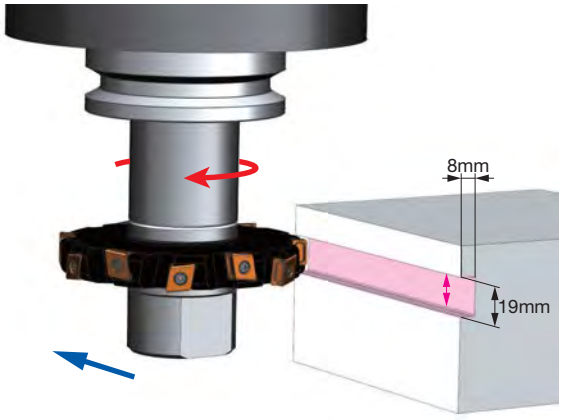


True Rake Angle

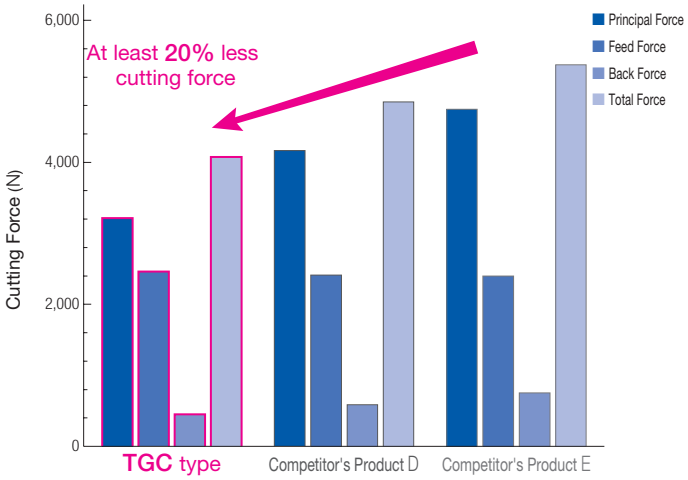


■ Cutting Performance

● Low Cutting Force

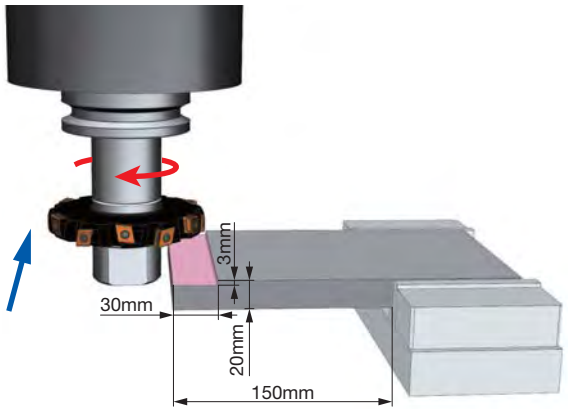


Machine	: Vertical Machining Centre BT50, Work Material: S50C
Tool	: TGC 13125W19Z12RS (ø125, Width of Cut 19mm, 12 teeth)
Insert	: TGCX 130708PNEN-G (ACU2500)
Cutting Conditions	: vc = 200m/min fz = 0.2mm/t ap = 19mm ae = 8mm, Down Cut, Dry

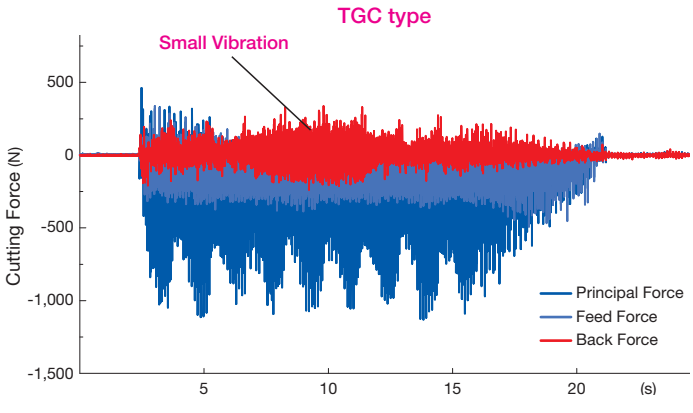


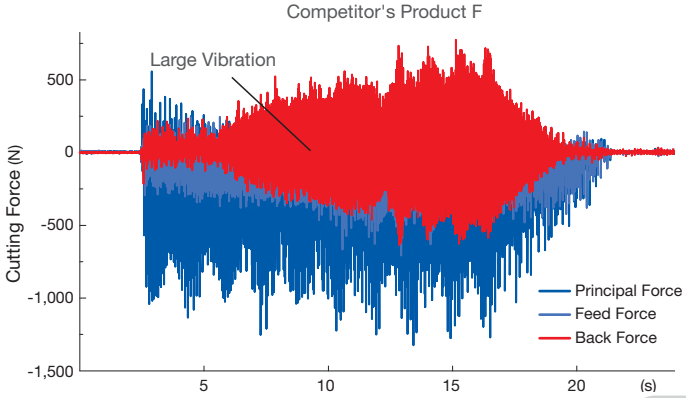
Excellent cutting edge sharpness eliminates chatter to enable stable machining

● Low Vibration



Machine	: Vertical Machining Centre BT50, Work Material: FC250
Tool	: TGC 13125W19Z12RS (ø125, Width of Cut 19mm, 12 teeth)
Insert	: TGCX 130708PNEN-G (ACU2500)
Cutting Conditions	: vc = 200m/min fz = 0.2mm/t ap = 3mm ae = 30mm, Down Cut, Dry

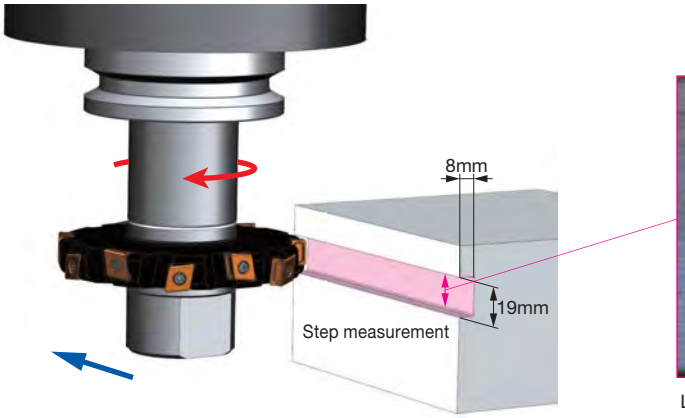


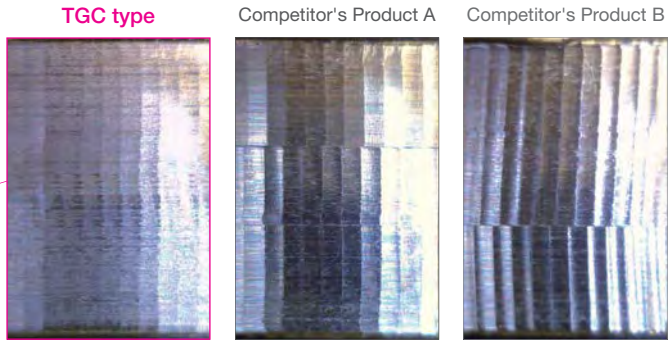


Suppresses chatter even when machining low-rigidity workpieces

● Small Joint Steps At Groove Bottom

Proprietary insert array design minimizes joint steps at groove bottom for excellent visual quality





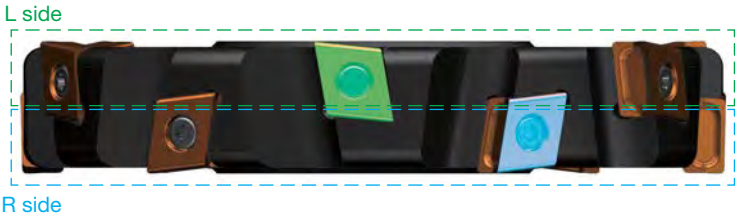
Machine	: Vertical Machining Centre BT50, Work Material: S50C
Tool	: TGC 13125W19Z12RS (ø125, Width of Cut 19mm, 12 teeth)
Insert	: TGCX 130708PNEN-G (ACU2500)
Cutting Conditions	: vc = 200m/min fz = 0.2mm/t ap = 19mm ae = 8mm, Down Cut, Dry

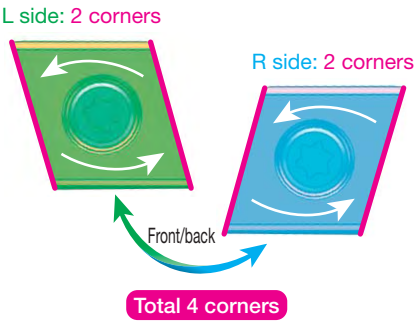
Excellent visual quality

*Results of in-house evaluation.

● Neutral-handed 4-cornered Insert

Easy management with neutral-handed insert design that eliminates the need to align right-hand and left-hand inserts



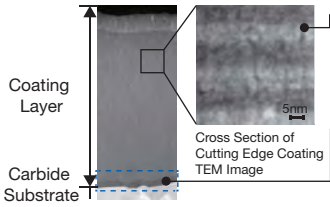


■ Grade Features

Work Material	Grade	Coating Thickness (μm)	Features
P M K S	ACU2500	3	Utilises ABSOTECH™ coating technology with excellent wear and chipping resistance. Its carbide substrate, with excellent fracture and wear resistance, achieves stable and long tool life for a variety of work materials.

Coating Layer Features

ABSOTECH — PVD



New Super Multi-Layered Structure
Higher hardness and twice the conventional wear resistance due to a fine crystal structure AlTiCrBN-based nano-layered coating

High Adhesion Strength
Significantly improved coating adhesion has more than twice the chipping resistance of conventional coatings

■ Grade Application Range (TGC type)

Work Material		Finishing to Light Cutting	Medium Cutting	Rough to Heavy Cutting
P Steel	Coated Carbide	ACU2500		
M Stainless Steel		ACU2500		
K Cast Iron			ACU2500	

The letter "P" at the end of each grade indicates the coating type. P: PVD

TGC 13000 type

P Steel | M Stainless Steel | K Cast Iron

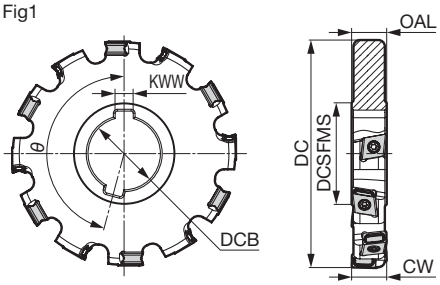
New

Rake Angle		
	Radial	-11.5° to -9.5°
	Axial	10°

17 to 24.6mm | 90°

Face Milling | Shoulder Milling | Side Milling | Groove Milling | Back Spot Facing | Width Setting

Fig1



Body (Standard Disc Shape)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Width of Cut CW	Boss Thickness OAL	Hole Dia. DCB	Keyway Width KWW	Phase θ (°)	Total No. of Teeth	Weight (kg)	Fig
Metric	TGC 13100W○○Z10RS		100	47	17 to 24.6	= CW	32	8	162	10	0.66 up	1
	13125W○○Z12RS		125	55	17 to 24.6	= CW	40	10	165	12	1.29 up	1
	13160W○○Z14RS		160	55	17 to 24.6	= CW	40	10	167.14	14	2.04 up	1
	13200W○○Z16RS		200	69	17 to 24.6	= CW	50	12	168.75	16	3.33 up	1

Basic specifications have two keyways. (Also available with only one) Inserts are sold separately.
The upper limit of width of cut CW is the value of inserts with corner radius RE0.4. For the width of cut CW upper limit values for each corner radius RE, see the Insert Cat. No. Table.
Disc shapes other than the standard type can be designed.

Identification Code

TGC Series Code | **13** Insert Size | **125** Dia. | **W17** Width of Cut | **Z12** Number of Teeth | **R** Feed Direction | **S** Metric Bore

Parts

Insert Screw		Wrench	Anti-seizure Cream
BFTX0412IP	3.0	TRDR15IP	SUMI-P

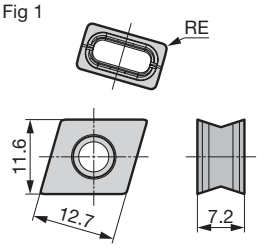
Insert

Dimensions (mm)

Grade Classification		Coated Carbide
Process	High-speed/Light Cutting	P K M
	Medium Cutting	P K M
	Roughing	P K M

Cat. No.	ACU2500	Corner Radius RE	Width of Cut CW Upper Limit	Fig
TGCX 130704PNEN-G	●	0.4	24.6	1
130708PNEN-G	●	0.8	23.7	1
130712PNEN-G	●	1.2	22.8	1
130716PNEN-G	●	1.6	22.0	1
130720PNEN-G	●	2.0	21.0	1

Fig 1



Recommended Cutting Conditions

ISO	Work Material	Hardness	Chipbreaker	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
P	Carbon Steel	180 to 280HB	G	100 - **200** - 300	0.1 - **0.2** - 0.25	ACU2500
	Alloy Steel	180 to 280HB	G	80 - **160** - 260	0.1 - **0.2** - 0.25	ACU2500
M	Stainless Steel	180 to 280HB	G	90 - **135** - 180	0.1 - **0.15** - 0.2	ACU2500
K	Cast Iron/Ductile Cast Iron	250HB	G	100 - **200** - 300	0.1 - **0.2** - 0.25	ACU2500

Note · The above figures are guidelines for simultaneous cutting with one R/L cutting tooth each, on a BT50 machine tool.
· The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.

SEC-Sumi Dual Mill TGC type Made-To-Order Request Sheet

Select a cutter design and enter the dimensions in □.

After completion, send the sheet to our nearest sales office or distributor.

Feel free to contact us for other shapes or dimensions or with other requests.

Company Name/Contact

■ Insert Series Configuration

Dimensions (mm)

Cat. No.	Corner Radius RE				
	0.4	0.8	1.2	1.6	2.0
TGCX 1307○○PNEN-G	●	●	●	●	●
TGCX 13 Width of Cut CW Upper Limit Value	24.6	23.7	22.8	22.0	21.0

● mark: Standard stocked item

A multi-stage design is required if the width of cut CW is wider than these upper limit values.

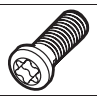
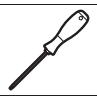
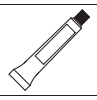
[Made-to-Order Insert Support]
Corner radius (RE) = 0.4 to 2.0mm supported.
(Machined radius size may differ from the corner radius RE size of the mounted inserts)

Width of Cut CW Size Reference Specification

Width of Cut CW	Insert type
17 to 24.6mm	TGCX 13

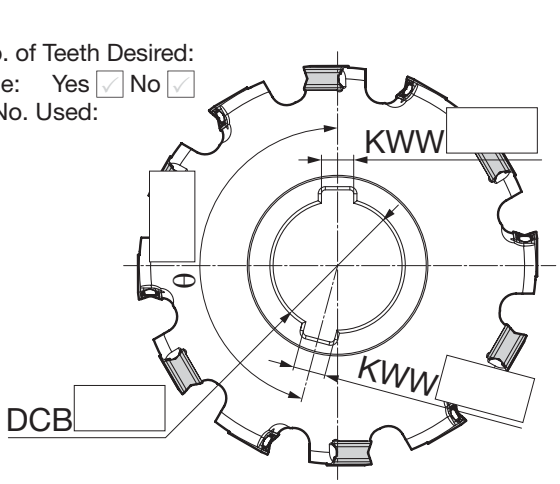
- The above width of cut CW upper limit value is the value with insert corner radius RE0.4.
- For the width of cut CW upper limit values for each corner radius RE, see the Insert Series Configuration Table on the left.

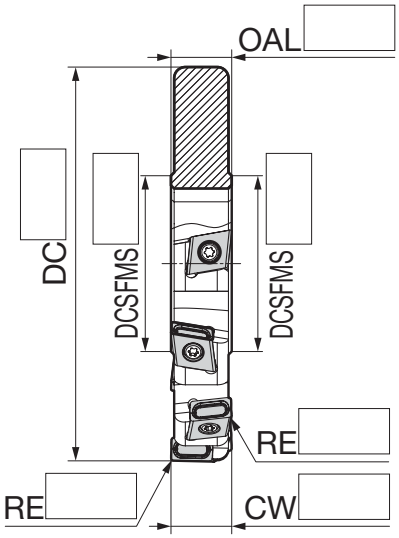
■ Accessories

Flat Insert Screw	Wrench	Anti-seizure Cream
		

☐ Disc

Effective No. of Teeth Desired:
Coolant Hole: Yes ☐ No ☐
Arbor Cat. No. Used:

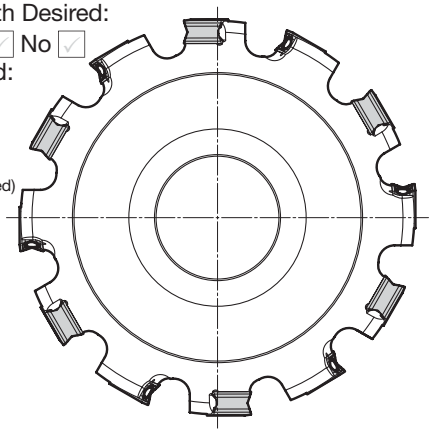


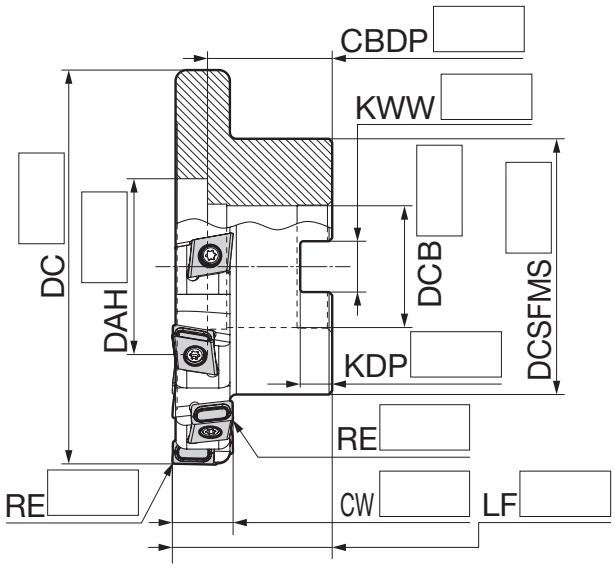


Basic specifications have two keyways. (Also available with only one)

☐ With Boss

Effective No. of Teeth Desired:
Coolant Hole: Yes ☐ No ☐
Arbor Cat. No. Used:
Feed Direction:
Right-handed ☐
Left-handed ☐
(Figure shows right-handed)





Designs for applications other than those listed above are possible, please consult us separately.

MEMO

TSE series

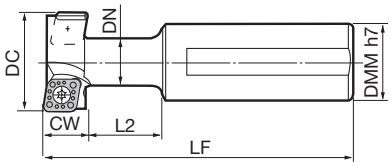
P Steel K Cast Iron

Rake Angle		
	Radial	0°
	Axial	0°

9 to 22mm 90°

Groove Milling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Diameter DN	Width CW	Length L2	Overall Length LF	Number of Teeth	Fig
TSE 2125	●	**21**	25	10.5	9	20	109	2	1
2525	●	**25**	25	12.5	11	21	112	2	1
3232	●	**32**	32	16.5	14	26	120	2	1
4032	●	**40**	32	20.5	18	32	130	2	1
5032	●	**50**	32	26.5	22	38	140	4	1

Inserts are sold separately.

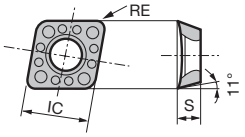
Insert

Dimensions (mm)

Grade Classification		Coated Carbide	Cemented Carbide	
Process	High-speed/Light Cutting			
	General-purpose	PM	PK	K
	Roughing			

Cat. No.	AC630M	A30	G10E	Inscribed Circle IC	Thickness S	Corner Radius RE	Applicable Cutter	Fig
CPMT 060204N-US	●	●	●	6.35	2.38	0.4	TSE 2125	1
080308N-US	●	●	●	7.938	3.18	0.8	TSE 2525	1
09T308N-US	●	●	●	9.525	3.97	0.8	TSE 3232	1
CPMH 120408N-US	●	●	●	12.7	4.76	0.8	TSE 4032 TSE 5032	1

Fig 1



Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
TSE2125	BFTX02506N	1.5	TRX08	SUMI-P
TSE2525	BFTX0307N	2.0	TRX10	
TSE3232	BFTX0407N	3.0	TRX15	
TSE4032 TSE5032	BFN0511T	5.0	TRX20	

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
P	Carbon Steel	180 to 280HB	100-**125**-150	0.05-**0.08**-0.10	AC630M
	Alloy Steel	180 to 280HB	60- **80** -100	0.03-**0.05**-0.08	AC630M
K	Cast Iron	250HB	60- **80** -100	0.05-**0.08**-0.10	G10E

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

WFXC series

VIDEO OF CUTTING

■ Features

The SEC-WaveMill WFXC type is a chamfering tool that uses a WFX series insert. A wide variety of grades supports various work materials.
In addition to the general-purpose grade ACU2500, applicable to various work materials, the new-generation coated carbide grades XCU2500/XCK2000 are now available.
Covering a wide variety of machining.

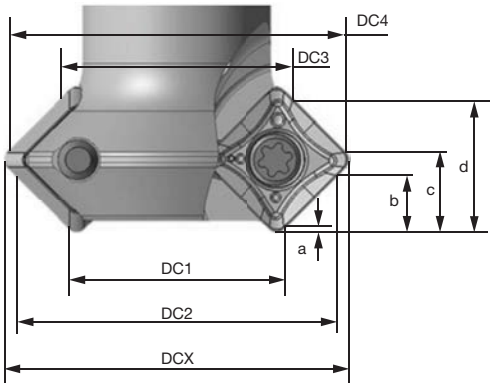
■ Precautions for Use

Chamfering tools use a straight cutting edge that enables the chamfering range to be changed depending on the corner radius (RE) of the insert mounted to the body.
Machining diameter: Use within the range shown in the table below, no lower than DC1 and no higher than DC2.
Depth of cut: Cutting to a depth shown by the distance from the tool tip (a) in a straight line to the cutting edge (b) is possible.

Dimensions (mm)

Body	Insert		Chamfering				Back Chamfering				Max. Dia.
			Min. Machining Dia.	Max. Machining Dia.	Minimum Depth	Maximum Depth	Min. Machining Dia.	Max. Machining Dia.	Minimum Depth	Maximum Depth	
	Cat. No.	RE	DC1	DC2	a	b	DC3	DC4	c	d	DCX
WFXC08008E	SOMT080304	0.4	7.5	15.8	0.1	4.1	9.3	17.6	5.8	9.9	17.8
	SOMT080308	0.8	8.0	15.8	0.2	3.9	9.3	17.1	5.9	9.8	17.5
	SOMT080312	1.2	8.5	15.8	0.4	3.6	9.3	16.6	6.0	9.6	17.2
WFXC08016E WFXC08016M	SOMT080304	0.4	15.5	23.8	0.1	4.1	17.3	25.6	5.8	9.9	25.8
	SOMT080308	0.8	16.0	23.8	0.2	3.9	17.3	25.1	5.9	9.8	25.5
	SOMT080312	1.2	16.5	23.8	0.4	3.6	17.3	24.6	6.0	9.6	25.2
WFXC12025E WFXC12025M	SOMT120404	0.4	24.6	38.3	0.1	6.8	27.3	41.2	9.1	16.0	41.3
	SOMT120408	0.8	25.0	38.3	0.2	6.6	27.3	40.6	9.2	15.8	41.0
	SOMT120412	1.2	25.6	38.3	0.4	6.3	27.3	40.1	9.3	15.7	40.7
	SOMT120416	1.6	26.1	38.3	0.5	6.1	27.3	39.5	9.4	15.5	40.4
WFXC12032E WFXC12032M	SOMT120404	0.4	31.6	45.3	0.1	6.8	34.3	48.2	9.1	16.0	48.3
	SOMT120408	0.8	32.0	45.3	0.2	6.6	34.3	47.6	9.2	15.8	48.0
	SOMT120412	1.2	32.6	45.3	0.4	6.3	34.3	47.1	9.3	15.7	47.7
	SOMT120416	1.6	33.1	45.3	0.5	6.1	34.3	46.5	9.4	15.5	47.4

Modular type H273



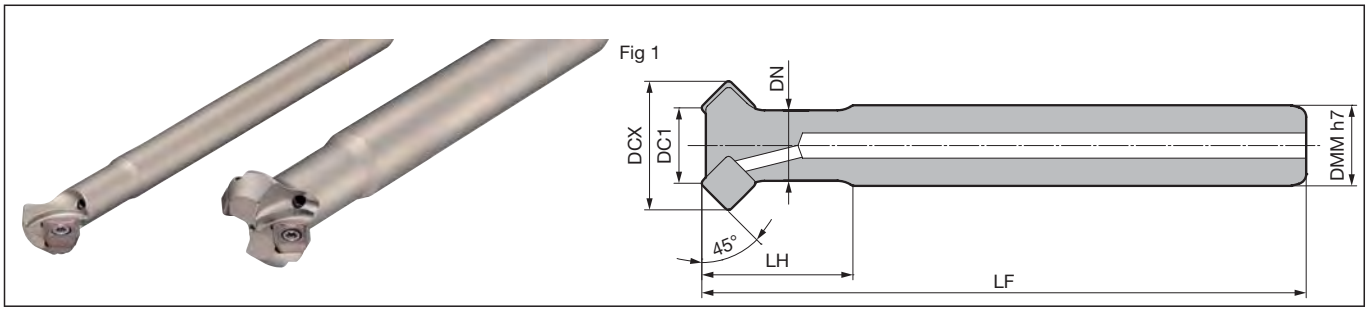
WFXC 08000E type

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	0°
	Axial	0°

45°

Chamfering | Back Chamfering



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Min. Machining Dia. DC1	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WFXC 08008E	●	**8**	17.5	10	30	120	1	0.1	1
08016E	●	**16**	25.5	16	30	120	2	0.2	1

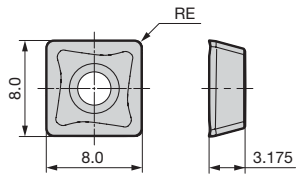
DC1 and DCX values were obtained with a 0.8 corner radius insert mounted.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	●	●	●			●	●		●		●	●			
	Medium Cutting	●	●		●	●	●	●		●	●		●	●		
	Roughing	●			●	●			●		●			●		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1

Fig 1



Precautions for Use H219

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
	N·m		
BFTX0306IP	**2.0**	TRDR08IP	SUMI-P

Identification Code

WFXC 08 016 E

Series Code	Insert Size	Min. Machining Dia.	Shank type

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.
P	General Steel	180 to 280 HB	150-**200**-250	0.05- **0.10** -0.15
	Mild Steel	≤ 180HB	180-**265**-350	0.10- **0.15** -0.20
	Die Steel	200 to 220 HB	100-**150**-200	0.05- **0.10** -0.15
M	Stainless Steel	—	150-**200**-250	0.05- **0.10** -0.15
K	Cast Iron	250HB	100-**175**-250	0.05- **0.10** -0.15
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10- **0.15** -0.20
S	Exotic Alloy	—	30- **50** -80	0.08- **0.13** -0.18

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

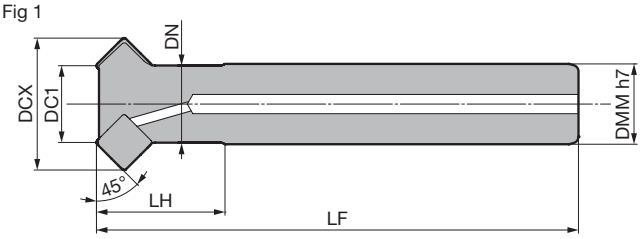
WFXC 12000E type

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Rake Angle	Radial	0°
	Axial	0°

45° Chamfering Back Chamfering

Fig 1



Body (Shank type)

Dimensions (mm)

Cat. No.	Stock	Min. Machining Dia. DC1	Max. Dia. DCX	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WFXC 12025E	●	**25**	41	25	40	150	3	0.6	1
12032E	●	**32**	48	32	40	150	3	1.0	1

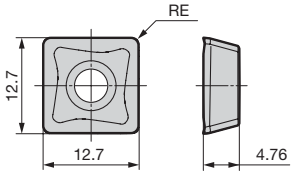
DC1 and DCX values were obtained with a 0.8 corner radius insert mounted.
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	●	●	●			●	●		●		●	●			
	Medium Cutting	●	●		●	●	●	●		●	●		●	●		
	Roughing	●			●	●			●		●			●		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 120408PDER-L		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOMT 120404PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
120408PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
120412PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.2	1
120416PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.6	1
SOMT 120408PDER-H		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
SOET 120408PDFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1

Fig 1



Precautions for Use H219

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX03512IP	**3.0**	TRDR15IP	SUMI-P

Identification Code

WFXC **12** **025** **E**

Series Code	Insert Size	Min. Machining Dia.	Shank type

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.
P	General Steel	180 to 280 HB	150-**200**-250	0.05-**0.10**-0.15
P	Mild Steel	≤ 180HB	180-**265**-350	0.10-**0.15**-0.20
P	Die Steel	200 to 220 HB	100-**150**-200	0.05-**0.10**-0.15
M	Stainless Steel	—	150-**200**-250	0.05-**0.10**-0.15
K	Cast Iron	250HB	100-**175**-250	0.05-**0.10**-0.15
N	Non-Ferrous Metals	—	300-**500**-1,000	0.10-**0.15**-0.20
S	Exotic Alloy	—	30- **50** -80	0.10-**0.15**-0.20

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

SMC series

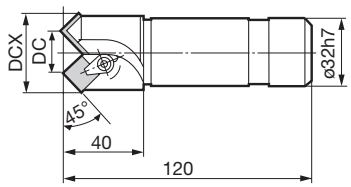
P Steel K Cast Iron

Rake Angle	Radial	0°
	Axial	0°

45°

Chamfering

Fig 1



(Figure shows SMC420)

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Number of Teeth	Diameter to be Chamfered	Fig
SMC 407	▲	**7**	24.3	1	ø11.0 to ø23.8	1
420	▲	**20**	37.3	2	ø21.2 to ø36.8	1
435	▲	**35**	52.3	2	ø36.2 to ø51.8	1

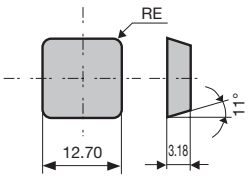
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide		Cemented Carbide			Cermet			
Process	High-speed/Light Cutting	K					P			
	General-purpose	K		P	P/K	K		P		
	Roughing		K							
Cat. No.		ACK200	ACK300	ST20E	A30	G10E	T1500A	T250A	Corner Radius RE	Fig
SPMN 422				●	●	●	●	●	0.8	1
423		●	●		●	●	●		1.2	1
SPG 422				●	●	●	●		0.8	1

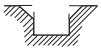
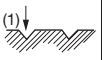
Fig 1



Parts

Clamp Plate	Flat Insert Screw			Wrench
		Size	N·m	
CCM6BR	WB616	**M6**	**5.0**	LH030

Applications

(1) Single Sided	(2) Double Sided	(3) Hole Chamfering	(4) Stepping	(5) Small Plunging, Traverse Cutting	
					

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

MEMO

VIDEO OF CUTTING

■ Features

- **Drastically Reduced Runout Adjustment Time**
  Simple screw-fastening structure enables fine adjustments to be made easily
- **Through-Blade Coolant**
  Ensures coolant supply to the cutting edge and breaks chips
- **Lightweight Aluminum Alloy Body (ANXA type)**
  Utilises aluminum alloy to achieve a total weight of less than 1.3kg for a ø125mm cutter with 22 teeth
- **Introducing the High-strength CVD Single Crystal Diamond SCV10 Wiper Blade WS type**

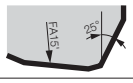
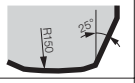
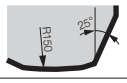
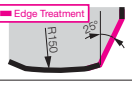
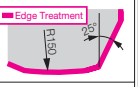
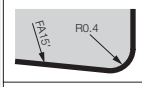
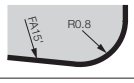
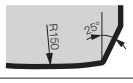
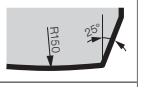
■ Product Range

Type	Cat. No.	Body Material	Max. Diameter (mm)									
			ø25	ø30	ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Shell	ANXA 16000R (Inch)	Aluminum Alloy							6 10 14	8 12 18	10 14 22	12 20 28
	ANXA 16000RS	Aluminum Alloy							6 10 14	8 12 18	10 14 22	12 20 28
	ANXS 16000R (Inch)	Steel						6 8 12	6 10 14	8 12 18	10 14 22	
	ANXS 16000RS	Steel				4 6	4 6 9	6 8 12	6 10 14	8 12 18	10 14 22	
Shank	ANXS 16000E	Steel	2	3 4	3 4	4 6	4 6 9					
Modular	ANXS 16000M	Steel	2	3 4	3 4	4 6						

Number in ●●● shows the number of teeth (Inch) Inch Bore

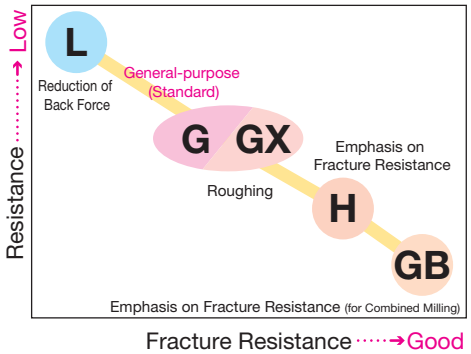
Modular type ☞H274

■ Blade Selection Guide

Work Material	N								
Applications	Finishing/ Light Cutting	General-purpose	Roughing		Composite Milling *1	Corner Radius Milling	Corner Radius Milling	Finishing	Burr-free Mirror Finish
Features	Low Cutting Force	Standard	Long Edge	High Strength	High Strength	Corner Radius 0.4	Corner Radius 0.8	Wiper	Wiper
Cutting Edge Shape	L	G	GX	H	GB	—	—	W	WS
									
Edge Length (*2)	6.0mm	6.0mm	9.0mm	6.0mm	6.0mm	6.0mm	6.0mm	2.0mm	1.0mm

*1 Machining of components combining aluminum alloy and cast iron. W type and WS type cannot be used together.

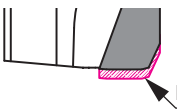
■ Blade Selection Reference

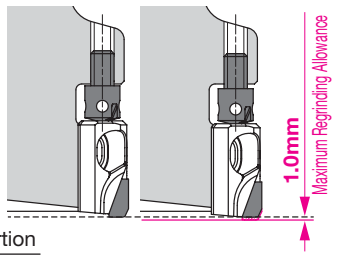


*2 Edge length

● Regrinding possible up to 1.0mm. Reduced running costs

Assuming 0.2mm of regrinding each time, an edge can be used up to 6 times.
(Peripheral cutting edge and WS type cannot be reground.)



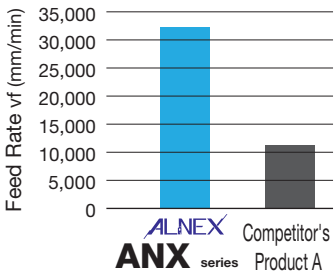


■ High-speed/High-efficiency Cutting

Realises ultra-high-efficiency machining with vf = 30,000mm/min

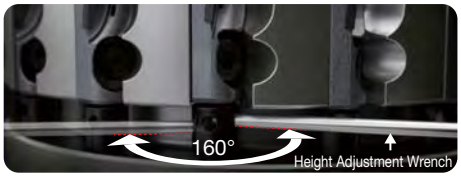
Cutter diameter ø100mm comparison

	Spindle Speed min⁻¹	Number of Teeth	Feed Rate vf(mm/min)
ALNEX ANX series	18,000	18	32,400
Competitor's Product A	9,500	12	11,400



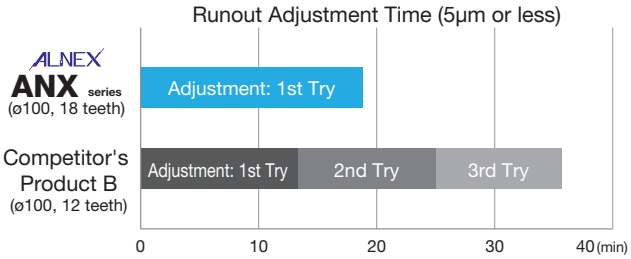
■ Drastically Reduced Runout Adjustment Time

● Simple screw-fastening structure ● Enables fine adjustments to be made easily ● High-rigidity body (reduces deformation due to tightening)



Adjustment is easy thanks to the large movable range of the height adjustment wrench.

We recommend keeping cutting edge height variation during runout adjustment to within 5μm.

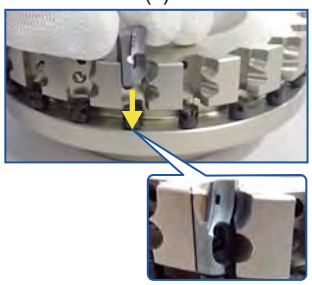


Completed on 1st Try, Adjustment Time Reduced

* Because the cutting edge chips off easily, care is required when mounting on the cutter body. Use a non-contact tool presetter.

■ Blade Mounting/Runout Adjustment

(1)



(1) Slide the blade into the cutter teeth groove.

(2)

(2) Lightly tighten the cap screw while pressing the blade against the restraining face. (1N·m)

(3)

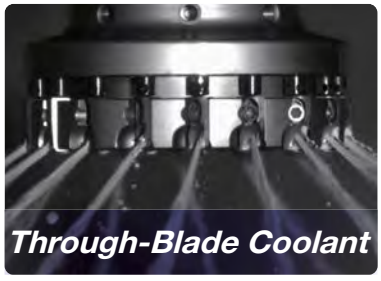
(3) Adjust the blade to the required height by using the dedicated wrench to turn the height adjustment screw.

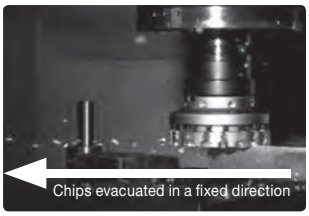
(4)

(4) Perform final tightening of the cap screw. (2N·m)

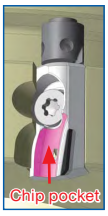
■ Chip Control

Through-Blade Coolant chip breaking





Controls the chips' scatter direction.



ALNEX ANX series

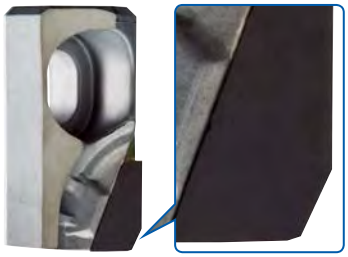
Competitor's Product C

The chip pocket catches the chips and suppresses damage to the body.

Work Material: ADC12 Cutting Conditions: vc = 2,500m/min, fz = 0.05mm/t, ap = 0.5mm, Wet

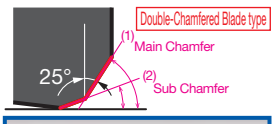
■ Burr Control

Reduces burrs by using a double-chamfered cutting edge (L/G/GX/H/GB type)

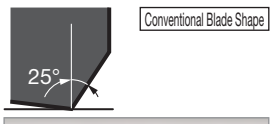


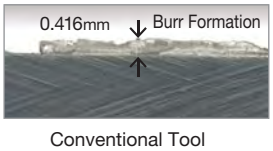
Drastically reduces burrs by preventing plastic deformation that causes burrs.

Work Material: A6061 Rolled Steel
Cutting Conditions: vc = 3,142m/min,
fz = 0.10mm/t, ap = 0.5mm Dry



ALNEX ANX series



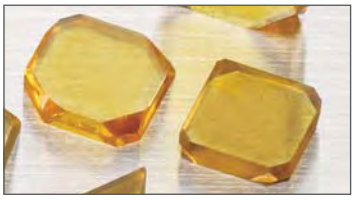


Conventional Tool

New CVD Single Crystal Diamond SCV10 Wiper Blade WS type

- Wiper blade adopts high-strength single-crystal diamond using Sumitomo Electric Hardmetal's vapour phase synthesis technology
- Sharp cutting edge achieves burr-free mirror finish in aluminum alloy machining
- Superior wear resistance maintains cutting edge sharpness for a long time, reducing total tool costs

Conventional single-crystal diamond

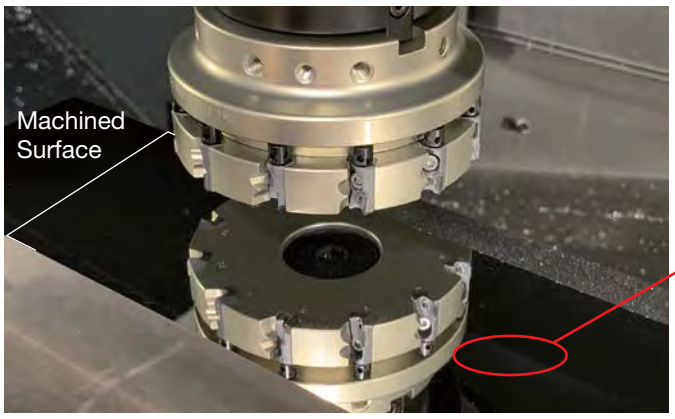


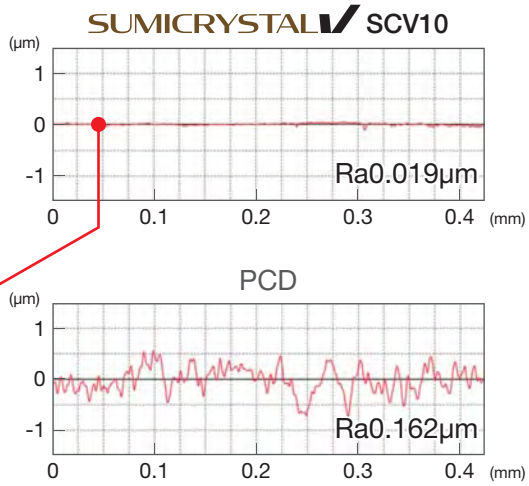
◆ Superb mirror surface and burr control through sharp cutting edge

Realizes a mirror finish in milling of aluminum alloys, copper alloys, and other non-ferrous metals, with long-term burr control

■ Mirror Finish (Wiper Blade WS type)

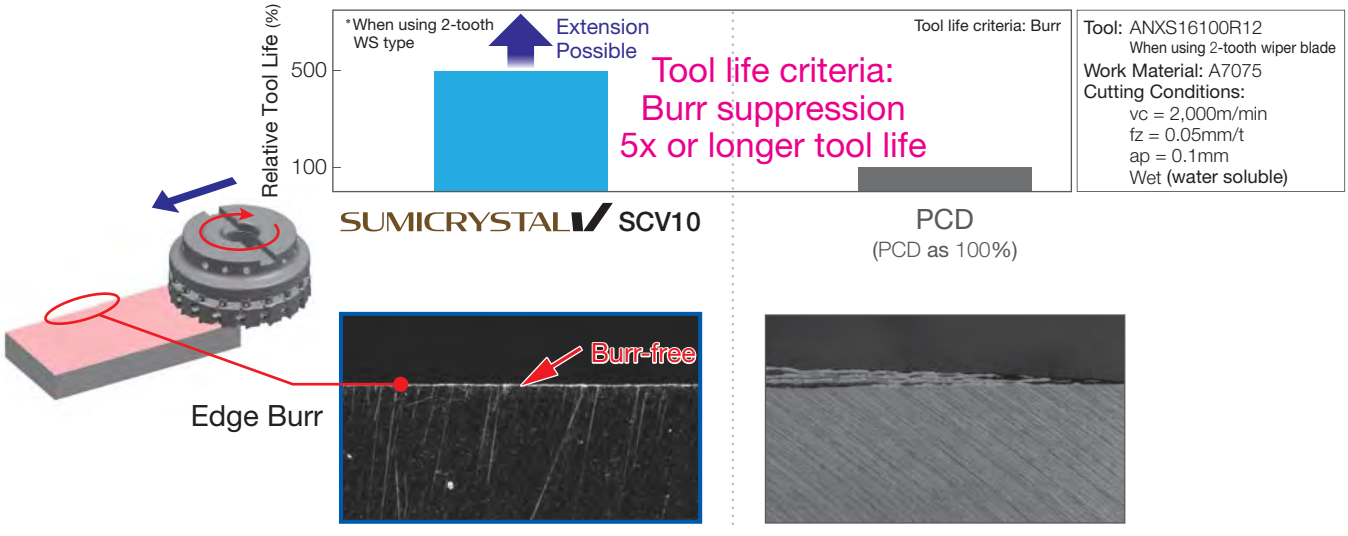
Sharp cutting edge achieves mirror finish with cutting alone





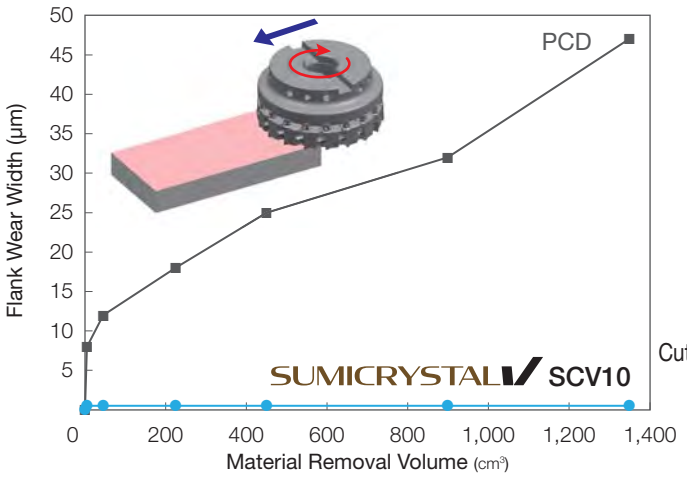
■ Burr-Free (Wiper Blade WS type)

Sharp cutting edge and excellent wear resistance suppress burrs over a long period

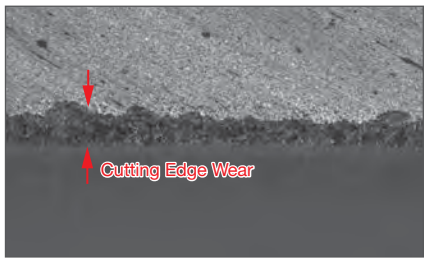


◆ Superior wear resistance maintains cutting edge sharpness for a long time

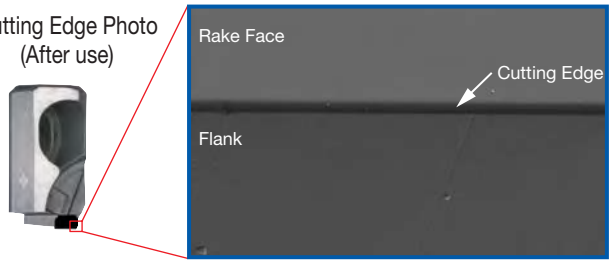
Wear resistance evaluation in high-silicon aluminum alloy machining



PCD



Cutting Edge Photo (After use)

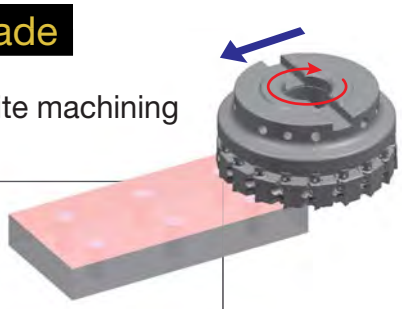


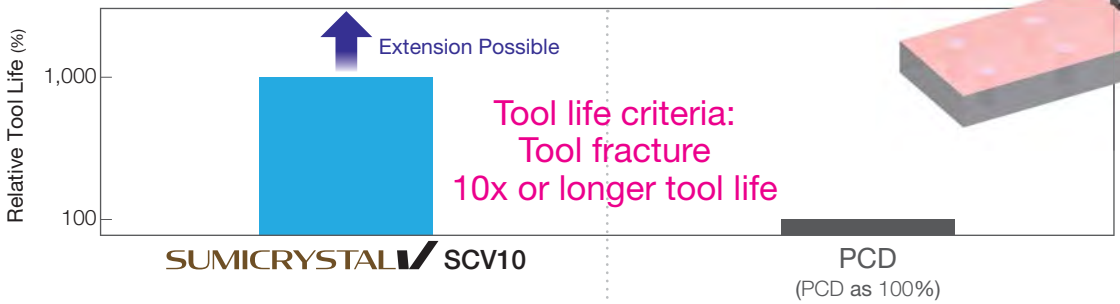
Work Material: Al-17wt.% Si alloy
Cutting Conditions: vc = 800m/min, fz = 1.0mm/t, ap = 0.03mm
Wet (water soluble)
*Evaluation with 1-tooth wiper blade
(dummy blade used in opposite position)

Long-term mirror finish with burrs suppressed and no flank wear progress

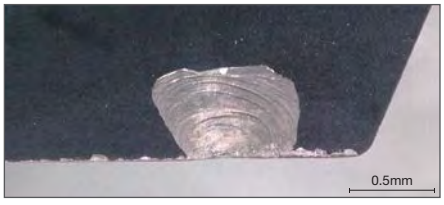
◆ Jet-black high-strength single-crystal diamond grade

Fracture resistance evaluation in aluminum alloy-ceramic composite machining





Cutting Edge Photo (after evaluation)



Work Material: Aluminum Alloy + Ceramic Composite
Cutting Conditions: vc = 2,500m/min, fz = 1.0mm/t, ap = 0.03mm
Wet (water soluble)
*Evaluation with 1-tooth wiper blade (dummy blade used in opposite position)

10x or more fracture resistance compared to PCD in finishing at low depth of cut (0.05 mm or less)

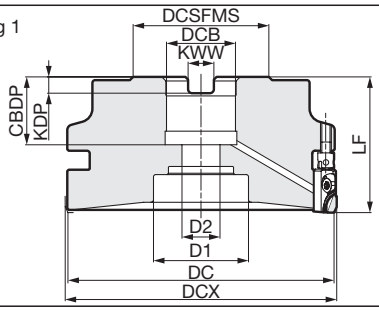
ANXA 16000R(S) type

Rake Angle		
Radial	+5°	
Axial	+5°	

3mm 90°

Face Milling | Shoulder Milling | Groove Milling

Fig 1



Body (Aluminum Alloy)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss Dia. DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**ANXA 16080RS06**	●	**80**	78	50	50	**27**	12.4	7	22	35	14	6	0.5	1
	16080RS10	●	**80**	78	50	50	**27**	12.4	7	22	35	14	10	0.5	1
	16080RS14	●	**80**	78	50	50	**27**	12.4	7	22	35	14	14	0.5	1
	16100RS08	●	**100**	98	50	50	**27**	12.4	7	22	35	14	8	0.8	1
	16100RS12	●	**100**	98	50	50	**27**	12.4	7	22	35	14	12	0.8	1
	16100RS18	●	**100**	98	50	50	**27**	12.4	7	22	35	14	18	0.8	1
	16125RS10	●	**125**	123	50	50	**27**	12.4	7	22	35	14	10	1.2	1
	16125RS14	●	**125**	123	50	50	**27**	12.4	7	22	35	14	14	1.2	1
	16125RS22	●	**125**	123	50	50	**27**	12.4	7	22	35	14	22	1.3	1
	16160RS12	●	**160**	158	80	63	**40**	16.4	9	29	52	29	12	2.6	1
	16160RS20	●	**160**	158	80	63	**40**	16.4	9	29	52	29	20	2.6	1
	16160RS28	●	**160**	158	80	63	**40**	16.4	9	29	52	29	28	2.6	1
Inch	**ANXA 16080R06**	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	6	0.5	1
	16080R10	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	10	0.5	1
	16080R14	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	14	0.5	1
	16100R08	●	**100**	98	50	50	**25.4**	9.5	6	25	35	14	8	0.8	1
	16100R12	●	**100**	98	50	50	**25.4**	9.5	6	25	35	14	12	0.9	1
	16100R18	●	**100**	98	50	50	**25.4**	9.5	6	25	35	14	18	0.9	1
	16125R10	●	**125**	123	50	50	**25.4**	9.5	6	25	35	14	10	1.2	1
	16125R14	●	**125**	123	50	50	**25.4**	9.5	6	25	35	14	14	1.2	1
	16125R22	●	**125**	123	50	50	**25.4**	9.5	6	25	35	14	22	1.3	1
	16160R12	●	**160**	158	80	63	**38.1**	15.9	10	35.5	55	30	12	2.3	1
	16160R20	●	**160**	158	80	63	**38.1**	15.9	10	35.5	55	30	20	2.4	1
	16160R28	●	**160**	158	80	63	**38.1**	15.9	10	35.5	55	30	28	2.6	1

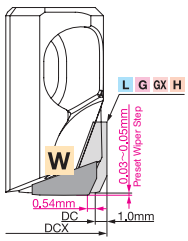
Blades are sold separately.
If using blades with corner radius (ANB1604R/ANB1608R), DC = DCX.
Weight indicated includes the weight with blades and other spare parts (excluding the centre bolt).
All aluminum alloy cutter bodies from (DCX) ø80 to ø125 have similar bore diameter (DCB) (metric ø27/inch ø25.4).
Note: The values in red have been changed from Rev. 3 and the 2021-2022 General Catalogue.

Identification Code

ANX	A	16	100	R	S	18
Series Code	Aluminum Alloy Body	Blade Size	Max. Dia.	Feed Direction	Metric Bore	Number of Teeth

■ Precautions when Using Wiper Blades

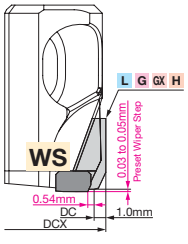
· W type Setting



⚠ Precautions

In order to maintain cutter balance when using the W type wiper blade, use a cutter with an even-number of cutting teeth and place another W type wiper blade at the opposite teeth position.

· WS type Setting



⚠ Precautions

(For more details, refer to the instruction manual included with the product)

In order to maintain cutter balance when using the WS type (SCV10 wiper blade), use a cutter with an even-number of cutting teeth and place another WS type wiper blade (or dummy blade ANBD) at opposite teeth positions.

*The dummy blade is dedicated for use with WS type.

ANXA 16000R(S) type

Expansion

Blade

Dimensions (mm)

Grade Classification		SUMIDIA		SUMICRYSTAL V
Process	High-speed/Light Cutting	N	KN	N
	General-purpose	N	KN	
	Roughing	N	KN	

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	Corner Radius RE	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●		—	6.0	—	Linear	Low Cutting Force	1
ANB 1600R-G	●		—	6.0	—	Arc-Shaped	General-purpose	1
ANB 1600R-GB		●	—	6.0	—	Arc-Shaped	Composite Milling*1	1
ANB 1600R-H	●	—	—	6.0	—	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●		—	9.0	—	Arc-Shaped	Long Edge	2
ANB 1604R	●		—	6.0	0.4	Linear	Corner Radius	3
ANB 1608R	●		—	6.0	0.8	Linear	Corner Radius	3
ANB 1600R-W	●		—	—	—	Arc-Shaped	Wiper	4
ANB 1600R-WS	—	—	●	—	—	Arc-Shaped	Wiper	5
ANBD	—	—	●*2	—	—	—	Dummy Blade	6

Fig 1

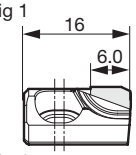


Fig 2

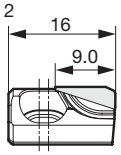


Fig 3

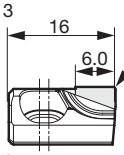
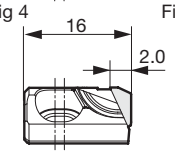
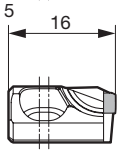


Fig 4



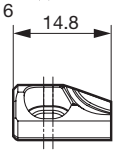
Wiper Blade

Fig 5



Wiper Blade

Fig 6



Dummy Blade

*1 Cast iron/aluminum alloy *2 Dummy blade for use with WS type (cemented carbide), refer to H228 "Precautions when Using Wiper Blades" (Mounting Precautions).

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000 SCV10

Si content of over 12.6%

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000 DA90 SCV10

Combined Milling of Cast Iron/Aluminum Alloy

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
K N	Cast Iron/ Aluminum Alloy	—	300 - **400** - 500	0.05 - **0.13** - 0.20	DA90

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
For combined milling of cast iron/aluminum alloy, we recommend DA90.
When using wiper blade WS type, see the table below.

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXA 16080RS06	20,000
16080RS10	20,000
16080RS14	20,000
16100RS08	18,000
16100RS12	18,000
16100RS18	18,000
16125RS10	16,000
16125RS14	16,000
16125RS22	16,000
16160RS12	14,000
16160RS20	14,000
16160RS28	14,000
ANXA 16080R06	20,000
16080R10	20,000
16080R14	20,000
16100R08	18,000
16100R12	18,000
16100R18	18,000
16125R10	16,000
16125R14	16,000
16125R22	16,000
16160R12	14,000
16160R20	14,000
16160R28	14,000

*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

Parts

Applicable Cutter	Cap Screw		Wrench	Adjustment Screw	Adjustment Wrench	Centre Bolt	
		N·m					N·m
ANXA 16080R(S)○○	BXA0310IP	2.0	TRXW10IP	HFJ	ANT	BXH1235-D33	50
ANXA 16100R(S)○○							
ANXA 16125R(S)○○							
ANXA 16160R(S)○○						BXH2036-D50	200

The adjustment wrench (ANT) can also be used for height adjustment of the High-speed Cutter RF type and High-efficiency Cutter HF type.

■ Wiper Blade WS type Recommended Feed Rate

WS Cutting Edge Feed Rate per Tooth*1 f_{zws} (mm/t_{ws})	D ≤ 0.5	0.5 < D ≤ 1.7	1.7 < D
Burr-free Finish	◎ Excellent		Impossible
Mirror Finishing	◎ Excellent	○ Good	
Target Surface Roughness Ra (μm)	0.015 to 0.05	up to 0.6	

*1 Feed Rate per WS Cutting Edge Tooth f_{zws}

$$f_{zws}\ (mm/t_{ws}) = \frac{f_z \times (\text{Total No. of Teeth})^{*2}}{(\text{WS type No. of Teeth})^{*3}}$$

Feed Rate per Tooth fz

$$f_z\ (mm/t) = \frac{\text{Feed Rate (vf) (mm/min)}}{\text{Spindle Speed n (min}^{-1}\text{)} \times (\text{Total No. of Teeth})}$$

*2 Total number of teeth includes dummy blade and wiper blade (WS type).

*3 WS type number of teeth does not include dummy blade.

ANXS 16000R(S) type

Rake Angle	Radial	+5°
	Axial	+5°

3mm 90°

Face Milling | Shoulder Milling | Groove Milling

Fig 1

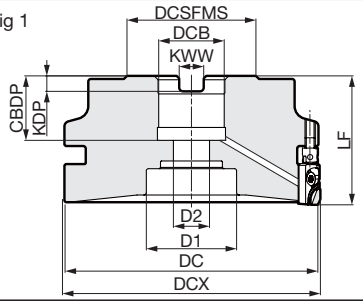
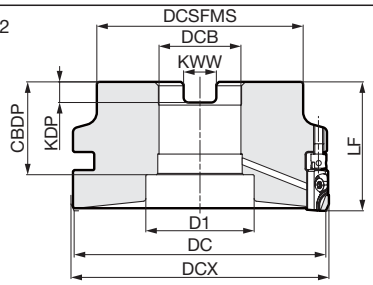


Fig 2



Body (Steel)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss Dia. DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**ANXS 16040RS04**	●	**40**	38	38.5	40	**16**	8.4	5.6	18	14	9	4	0.3	1
	16040RS06	●	**40**	38	38.5	40	**16**	8.4	5.6	18	14	9	6	0.3	1
	16050RS04	●	**50**	48	48.5	40	**22**	10.4	6.3	20	18	11	4	0.4	1
	16050RS06	●	**50**	48	48.5	40	**22**	10.4	6.3	20	18	11	6	0.4	1
	16050RS09	●	**50**	48	48.5	40	**22**	10.4	6.3	20	18	11	9	0.4	1
	16063RS06	●	**63**	61	50	40	**22**	10.4	6.3	20	18	11	6	0.7	1
	16063RS08	●	**63**	61	50	40	**22**	10.4	6.3	20	18	11	8	0.7	1
	16063RS12	●	**63**	61	50	40	**22**	10.4	6.3	20	18	11	12	0.7	1
	16080RS06	●	**80**	78	50	50	**27**	12.4	7	22	35	14	6	1.2	1
	16080RS10	●	**80**	78	50	50	**27**	12.4	7	22	35	14	10	1.2	1
	16080RS14	●	**80**	78	50	50	**27**	12.4	7	22	35	14	14	1.2	1
	16100RS08	●	**100**	98	80	50	**32**	14.4	8	32	46	—	8	1.9	2
	16100RS12	●	**100**	98	80	50	**32**	14.4	8	32	46	—	12	2.0	2
	16100RS18	●	**100**	98	80	50	**32**	14.4	8	32	46	—	18	2.0	2
	16125RS10	●	**125**	123	80	63	**40**	16.4	9	29	52	29	10	3.8	1
	16125RS14	●	**125**	123	80	63	**40**	16.4	9	29	52	29	14	3.9	1
	16125RS22	●	**125**	123	80	63	**40**	16.4	9	29	52	29	22	3.9	1
Inch	**ANXS 16063R06**	●	**63**	61	50	50	**25.4**	9.5	6	25	20	14	6	0.9	1
	16063R08	●	**63**	61	50	50	**25.4**	9.5	6	25	20	14	8	0.9	1
	16063R12	●	**63**	61	50	50	**25.4**	9.5	6	25	20	14	12	0.9	1
	16080R06	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	6	1.2	1
	16080R10	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	10	1.2	1
	16080R14	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	14	1.2	1
	16100R08	●	**100**	98	80	50	**31.75**	12.7	8	36	42	—	8	1.9	2
	16100R12	●	**100**	98	80	50	**31.75**	12.7	8	36	42	—	12	2.0	2
	16100R18	●	**100**	98	80	50	**31.75**	12.7	8	36	42	—	18	2.0	2
	16125R10	●	**125**	123	80	63	**38.1**	15.9	10	35.5	52	29	10	3.9	1
	16125R14	●	**125**	123	80	63	**38.1**	15.9	10	35.5	52	29	14	3.9	1
	16125R22	●	**125**	123	80	63	**38.1**	15.9	10	35.5	52	29	22	3.9	1

Blades are sold separately.
If using blades with corner radius (ANB1604R/ANB1608R), DC = DCX.
Weight indicated includes the weight with blades and other spare parts (excluding the centre bolt).
Note: The values in red have been changed from Rev. 3 and the 2021-2022 General Catalogue.

Identification Code

ANX	S	16	100	R	S	18
Series Code	Steel Body	Blade Size	Max. Dia.	Feed Direction	Metric Bore	Number of Teeth

ANXS 16000R(S) type

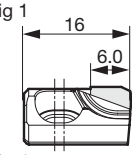
Expansion

Blade

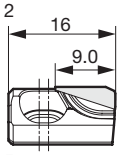
Dimensions (mm)

Grade Classification		SUMIDIA		SUMICRYSTAL V
Process	High-speed/Light Cutting	N	KN	N
	General-purpose	N	KN	
	Roughing	N	KN	

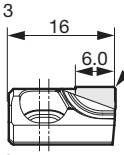
Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	Corner Radius RE	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●		—	6.0	—	Linear	Low Cutting Force	1
ANB 1600R-G	●		—	6.0	—	Arc-Shaped	General-purpose	1
ANB 1600R-GB		●	—	6.0	—	Arc-Shaped	Composite Milling*1	1
ANB 1600R-H	●	—	—	6.0	—	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●		—	9.0	—	Arc-Shaped	Long Edge	2
ANB 1604R	●		—	6.0	0.4	Linear	Corner Radius	3
ANB 1608R	●		—	6.0	0.8	Linear	Corner Radius	3
ANB 1600R-W	●		—	—	—	Arc-Shaped	Wiper	4
ANB 1600R-WS	—	—	●	—	—	Arc-Shaped	Wiper	5
ANBD	—	—	●*2	—	—	—	Dummy Blade	6

Fig 1 

Wiper Blade

Fig 2 

Wiper Blade

Fig 3 

Dummy Blade

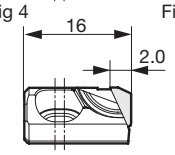
Fig 4 

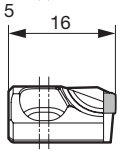
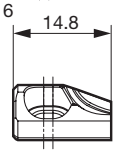
Fig 5 

Fig 6 

*1 Cast iron/aluminum alloy *2 Dummy blade for use with WS type (cemented carbide), refer to H228 "Precautions when Using Wiper Blades" (Mounting Precautions).

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000 SCV10

Si content of over 12.6%

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000 DA90 SCV10

Combined Milling of Cast Iron/Aluminum Alloy

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
K N	Cast Iron/ Aluminum Alloy	—	300 - **400** - 500	0.05 - **0.13** - 0.20	DA90

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
For combined milling of cast iron/aluminum alloy, we recommend DA90.
When using wiper blade WS type, refer to page H229.

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXS 16040RS04	25,000
16040RS06	25,000
16050RS04	25,000
16050RS06	25,000
16050RS09	25,000
16063RS06	22,000
16063RS08	22,000
16063RS12	22,000
16080RS06	20,000
16080RS10	20,000
16080RS14	20,000
16100RS08	18,000
16100RS12	18,000
16100RS18	18,000
16125RS10	16,000
16125RS14	16,000
16125RS22	16,000
ANXS 16063R06	22,000
16063R08	22,000
16063R12	22,000
16080R06	20,000
16080R10	20,000
16080R14	20,000
16100R08	18,000
16100R12	18,000
16100R18	18,000
16125R10	16,000
16125R14	16,000
16125R22	16,000

*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

Parts

Applicable Cutter	Cap Screw	N·m	Wrench	Adjustment Screw	Adjustment Wrench	Centre Bolt	N·m
ANXS 16040RS○○	BXA0310IP	2.0	TRXW10IP	HFJ	ANT	BXH0825-D13	15
ANXS 16050RS○○						BXH1030-D16	25
ANXS 16063RS○○							
ANXS 16080RS○○						BXH1235-D33	50
ANXS 16100RS○○						BXH1635-D40	100
ANXS 16125RS○○						BXH2036-D50	200
ANXS 16063R○○	BXA0310IP	2.0	TRXW10IP	HFJ	ANT	BXH1235-D18	40
ANXS 16080R○○						BXH1235-D33	50
ANXS 16100R○○						BXH1635-D40	100
ANXS 16125R○○						BXH2036-D50	200

The adjustment wrench (ANT) can also be used for height adjustment of the High-speed Cutter RF type and High-efficiency Cutter HF type.

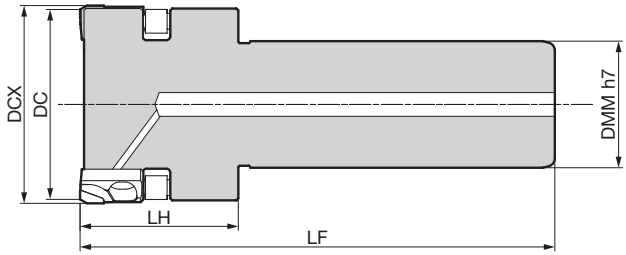
ANXS 16000E type

Rake Angle	Radial	-2° to 0°
	Axial	+5°

3mm 90°

Face Milling Shoulder Milling Groove Milling

Fig 1



Body (Steel)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank Dia. DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
ANXS 16025E02	●	**25**	23	20	35	95	2	0.2	1
16030E03	●	**30**	28	20	35	95	3	0.3	1
16030E04	●	**30**	28	20	35	95	4	0.3	1
16032E03	●	**32**	30	20	35	95	3	0.3	1
16032E04	●	**32**	30	20	35	95	4	0.3	1
16040E04	●	**40**	38	20	40	100	4	0.4	1
16040E06	●	**40**	38	20	40	100	6	0.5	1
16050E04	●	**50**	48	32	40	120	4	1.0	1
16050E06	●	**50**	48	32	40	120	6	1.0	1
16050E09	●	**50**	48	32	40	120	9	1.0	1

Blades are sold separately.
If using blades with corner radius (ANB1604R/ANB1608R), DC = DCX.
Weight indicated includes the weight with blades and other spare parts.

Identification Code

ANX	S	16	032	E	04
Series Code	Steel Body	Blade Size	Max. Dia.	Shank type	Number of Teeth

ANXS 16000E type

Expansion

Blade

Dimensions (mm)

Grade Classification		SUMIDIA		SUMICRYSTAL V
Process	High-speed/Light Cutting	N	KN	N
	General-purpose	N	KN	
	Roughing	N	KN	

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	Corner Radius RE	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●		—	6.0	—	Linear	Low Cutting Force	1
ANB 1600R-G	●		—	6.0	—	Arc-Shaped	General-purpose	1
ANB 1600R-GB		●	—	6.0	—	Arc-Shaped	Composite Milling*1	1
ANB 1600R-H	●	—	—	6.0	—	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●		—	9.0	—	Arc-Shaped	Long Edge	2
ANB 1604R	●		—	6.0	0.4	Linear	Corner Radius	3
ANB 1608R	●		—	6.0	0.8	Linear	Corner Radius	3
ANB 1600R-W	●		—	—	—	Arc-Shaped	Wiper	4
ANB 1600R-WS	—	—	●	—	—	Arc-Shaped	Wiper	5
ANBD	—	—	●*2	—	—	—	Dummy Blade	6

Fig 1

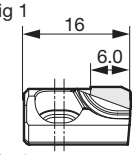


Fig 2

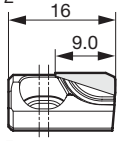


Fig 3

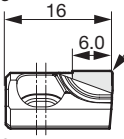
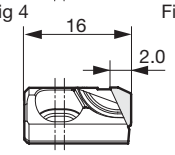
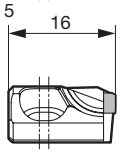


Fig 4



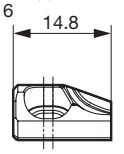
Wiper Blade

Fig 5



Wiper Blade

Fig 6



Dummy Blade

*1 Cast iron/aluminum alloy *2 Dummy blade for use with WS type (cemented carbide), refer to H228 "Precautions when Using Wiper Blades" (Mounting Precautions).

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000 SCV10

Si content of over 12.6%

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000 DA90 SCV10

Combined Milling of Cast Iron/Aluminum Alloy

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
K N	Cast Iron/ Aluminum Alloy	—	300 - **400** - 500	0.05 - **0.13** - 0.20	DA90

Note
- The above are the recommended conditions for ANX series overall. Use within the maximum allowable spindle speed.
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors. For combined milling of cast iron/aluminum alloy, we recommend DA90.
- When using wiper blade WS type, refer to page H229.

Parts

Cap Screw		Wrench	Adjustment Screw	Adjustment Wrench
	N·m			
BXA0310IP	**2.0**	TRXW10IP	HFJ	ANT

The adjustment wrench (ANT) can also be used for height adjustment of the High-speed Cutter RF type and High-efficiency Cutter HF type.

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXS 16025E02	10,000
16030E03	10,000
16030E04	10,000
16032E03	10,000
16032E04	10,000
16040E04	10,000
16040E06	10,000
16050E04	10,000
16050E06	10,000
16050E09	10,000

*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

HF series

VIDEO OF CUTTING

■ Features

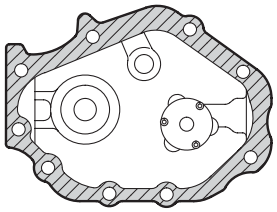
The HF type high-efficiency aluminum alloy cutter employs a unique blade design to achieve machining without burrs.
HFFH type with coolant holes is now available as a BBT30 (BIG-PLUS™) arbor integrated version.

Work Material

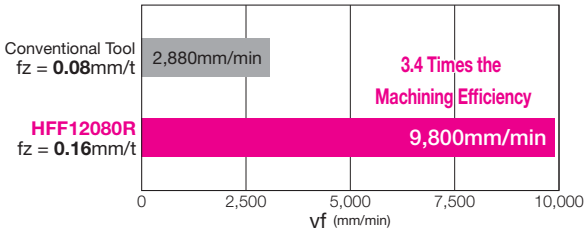
· Aluminum and aluminum alloys
· Other non-ferrous metals
(Not suited for cast iron or steel.)

● Achieves high-efficiency milling with vf of over 20,000 mm/min thanks to its multi-blade design (3 teeth per inch)

High-feed, High-efficiency Milling with Multi-blade Design



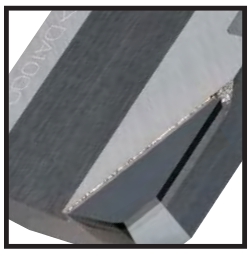
Workpiece: Aluminum Case (Frame Milling)
Tool: **HFF12080R-25.4** (ø80 10-tooth),
Conventional Tool (ø80 6-tooth)



■ Maximum Allowable Spindle Speed and Feed Rate

Cutter Dia. (mm)	nmax (min⁻¹)	vc (m/min)	fz (mm/t)	Max. No. of Teeth (pcs.)	vf (mm/min)
ø80	11,000	2,763	up to 0.2	10	up to 22,000
ø100	9,500	2,983	up to 0.2	12	up to 22,800
ø125	7,500	2,944	up to 0.2	15	up to 22,500

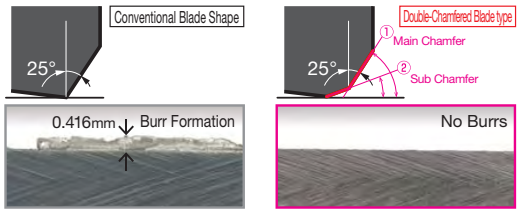
* The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

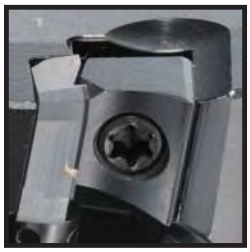


● Reduces burrs by using a double-chamfered blade type

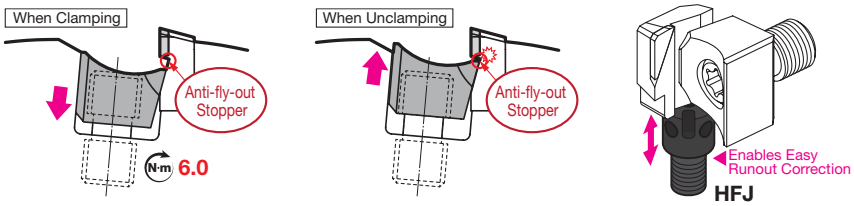
Drastically reduces burrs by preventing plastic deformation that causes burrs.

Work Material: **A6061** Rolled Steel
Cutting Conditions: vc = **3,142**m/min,
fz = **0.10**mm/t,
ap = **0.5**mm, Dry





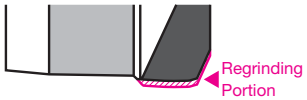
● Wedge clamp with anti-fly-out mechanism ensures safety and operability

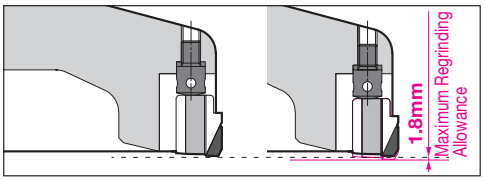


Ensure that the maximum allowable spindle speed (n max) specified for each cutter diameter is not exceeded. (See the table at upper right)

● Reduces running costs by drastically increasing blade regrinding allowance (to 1.8mm)

Assuming 0.2mm of regrinding each time, an edge can be used up to 10 times.
(Given conditions of normal wear with ap = **1.4**mm or less)





The regrinding allowance has been drastically increased compared to conventional screw-lock types.

● Internal coolant improves chip evacuation performance (HFFH type, HFFH-BBT30 type)

The internal coolant effectively prevents chips from becoming clogged or biting into the work material and achieves longer tool life. (Use an internal coolant compatible arbor)

*1: BIG-PLUS™ is a registered trademark of BIG DAISHOWA Co., Ltd.
*2: Can also be used with BT30 spindle machines.

N·m Recommended Tightening Torque (N·m)

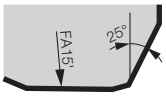
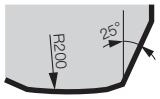
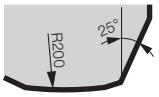
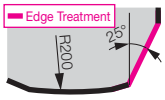
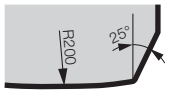
HF series

■ Product Range

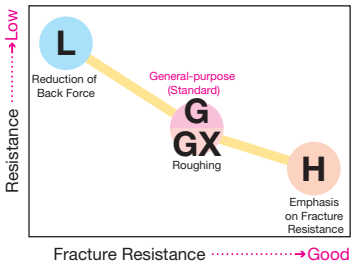
Type	Cat. No.	Dia. (mm) ø80	ø100	ø125
Shell	HFM 12000RS	6*	8	10*
	HFM 12000R (Inch)	6	8*	10*
	HFF 12000RS	10*	12	15*
	HFF 12000R (Inch)	10	12*	15*
	HFFH 12000RS	10*	12	15*
	HFFH 12000R (Inch)	10	12*	15*
	HFFH 12000R-BBT30	10	12	15

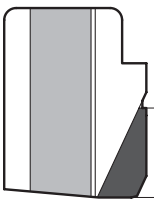
Number in ● shows the number of teeth (Inch) Inch Bore *mark: Different diameter shanks in stock

■ Blade Selection Guide

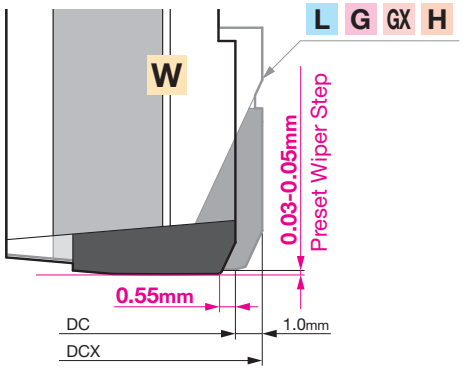
Work Material	N				
Applications	Reduction of Back Force	General-purpose	Roughing	Emphasis on Fracture Resistance	Finishing
Features	Low Cutting Force	Standard	Long Edge	High Strength	Wiper
Type	L type	G type	GX type	H type	W type
Cutting Edge Shape					
Edge Length (*)	6.0mm	6.0mm	9.0mm	6.0mm	2.0mm

■ Blade Selection Reference



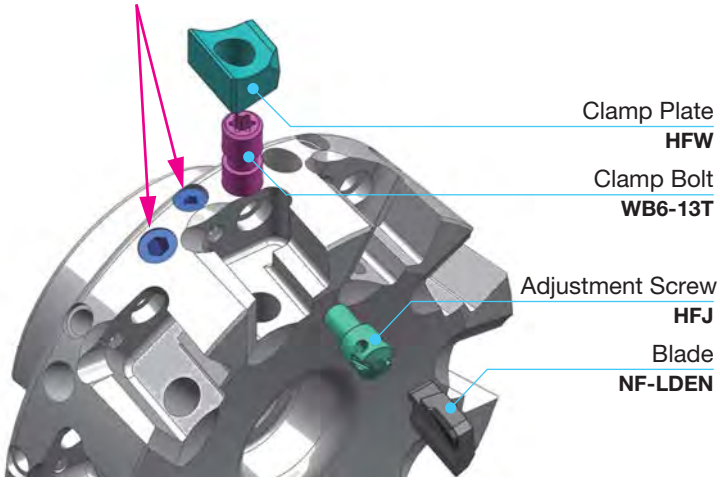


■ Wiper Blade Step Amount



■ Structure of HF type

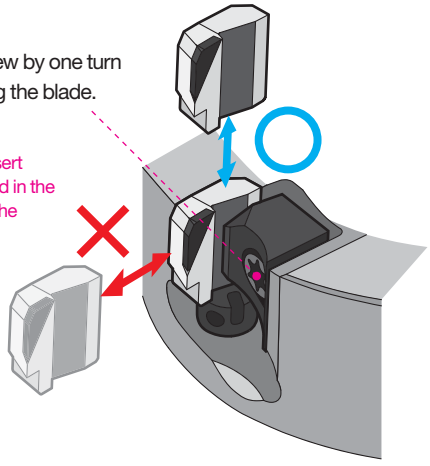
The axial set screw and balance adjustment screw hole have an embedded special part that prevents the insertion of screwdrivers or hex wrenches.



■ Blade Mounting Direction

Loosen the screw by one turn before removing the blade.

⚠ Note that if the insert is forcibly removed in the wrong direction, the part may break.



HFM 12000RS/R type

Rake Angle		
Rake	Radial	4°
Angle	Axial	10°

3mm 90°

Face Milling

Fig 1

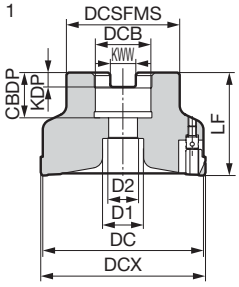


Fig 2

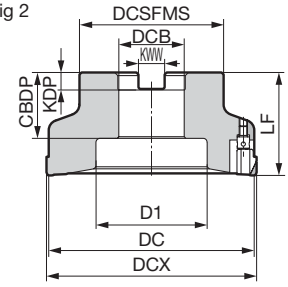
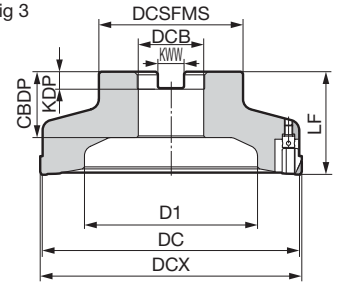


Fig 3



Body (Fine Pitch: 2-teeth/Inch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**HFM 12080RS-22**	●	**80**	82	50	40	**22**	10.4	6.3	20	18	11	6	1.0	1
	12080RS-27	●	**80**	82	55	50	**27**	12.4	7	22	20	14	6	1.2	1
	12100RS-32	●	**100**	102	70	50	**32**	14.4	8	32	54	—	8	1.7	2
	12125RS-32	●	**125**	127	70	50	**32**	14.4	8	32	84	—	10	2.2	3
	12125RS-40	●	**125**	127	90	63	**40**	16.4	9	35	84	—	10	2.8	3
Inch	**HFM 12080R-25.4**	●	**80**	82	50	50	**25.4**	9.5	6	30	35	—	6	1.0	2
	12100R-25.4	●	**100**	102	50	50	**25.4**	9.5	6	30	54	—	8	1.5	2
	12100R-31.75	●	**100**	102	70	50	**31.75**	12.7	8	32	54	—	8	1.7	2
	12125R-25.4	●	**125**	127	50	50	**25.4**	9.5	6	30	84	—	10	2.0	3
	12125R-31.75	●	**125**	127	70	50	**31.75**	12.7	8	32	84	—	10	2.2	3
	12125R-38.1	●	**125**	127	80	63	**38.1**	15.9	10	36	84	—	10	2.5	3

Blades are sold separately.

Blade

Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
NF-LDEN 12T3ZDFR-L	●	6.0	Linear	Low Cutting Force	1
12T3ZDFR-G	●	6.0	Arc-Shaped	General-purpose	1
12T3ZDTR-H	●	6.0	Arc-Shaped	Strong Edge	1
12T3ZDFR-GX	●	9.0	Arc-Shaped	Long Edge	2
12T3ZDFR-W	●	2.0	Arc-Shaped	Wiper	3

Fig 1

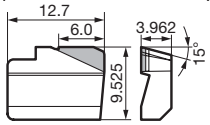


Fig 2

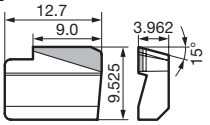
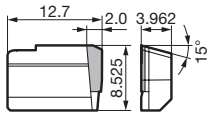


Fig 3 Wiper Blade



Parts

(Sold Separately)

Clamp Plate	Bolt		Adjustment Screw	Wrench	Wrench	Assembly Wrench
HFW	WB6-13T	6.0	HFJ	TTX20	RFT	HFVT

Identification Code

HF M 12 080 R S - 22

Series Code	Fine Pitch	Blade Size	Dia.	Feed Direction	Metric Bore	Hole Dia.

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	2,000- **2,500** -3,000	0.05- **0.13** -0.20	DA1000

Note
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- The above are the recommended conditions for HF type overall. Use within the maximum allowable spindle speed.

Si content of over 12.6%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	400- **600** -800	0.05- **0.13** -0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

HFF 12000RS/R type

Rake Angle		
	Radial	4°
	Axial	10°

3mm 90°

Face Milling

Fig 1

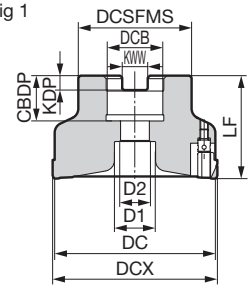


Fig 2

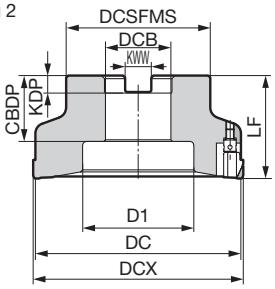
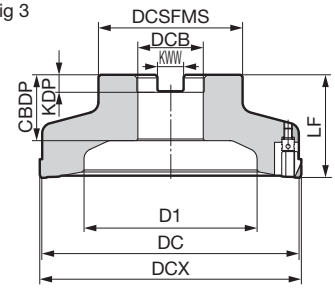


Fig 3



Body (Extra Fine Pitch: 3-Tooth/Inch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**HFF 12080RS-22**	●	**80**	82	50	40	**22**	10.4	6.3	20	18	11	10	1.0	1
	12080RS-27	●	**80**	82	55	50	**27**	12.4	7	22	20	14	10	1.2	1
	12100RS-32	●	**100**	102	70	50	**32**	14.4	8	32	54	—	12	1.7	2
	12125RS-32	●	**125**	127	70	50	**32**	14.4	8	32	84	—	15	2.2	3
	12125RS-40	●	**125**	127	90	63	**40**	16.4	9	35	84	—	15	2.8	3
Inch	**HFF 12080R-25.4**	●	**80**	82	50	50	**25.4**	9.5	6	30	35	—	10	1.0	2
	12100R-25.4	●	**100**	102	50	50	**25.4**	9.5	6	30	54	—	12	1.5	2
	12100R-31.75	●	**100**	102	70	50	**31.75**	12.7	8	32	54	—	12	1.7	2
	12125R-25.4	●	**125**	127	50	50	**25.4**	9.5	6	30	84	—	15	2.0	3
	12125R-31.75	●	**125**	127	70	50	**31.75**	12.7	8	32	84	—	15	2.2	3
	12125R-38.1	●	**125**	127	80	63	**38.1**	15.9	10	36	84	—	15	2.5	3

Blades are sold separately.

Blade

Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
NF-LDEN 12T3ZDFR-L	●	6.0	Linear	Low Cutting Force	1
12T3ZDFR-G	●	6.0	Arc-Shaped	General-purpose	1
12T3ZDTR-H	●	6.0	Arc-Shaped	Strong Edge	1
12T3ZDFR-GX	●	9.0	Arc-Shaped	Long Edge	2
12T3ZDFR-W	●	2.0	Arc-Shaped	Wiper	3

Fig 1

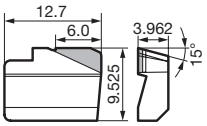


Fig 2

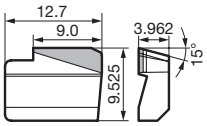
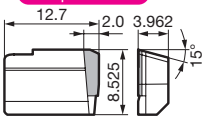


Fig 3 Wiper Blade



Parts

Clamp Plate	Bolt		Adjustment Screw	Wrench	Wrench
HFW	WB6-13T	**6.0**	HFJ	TTX20	RFT

(Sold Separately)

Assembly Wrench
HFVT

Identification Code

HF	F	12	080	R	S	-	22
Series Code	Extra Fine Pitch	Blade Size	Dia.	Feed Direction	Metric Bore		Hole Dia.

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	2,000- **2,500** -3,000	0.05- **0.13** -0.20	DA1000

Note
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- The above are the recommended conditions for HF type overall. Use within the maximum allowable spindle speed.

Si content of over 12.6%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	400- **600** -800	0.05- **0.13** -0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

HFFH 12000RS/R type

Rake Angle		
Rake	Radial	4°
Angle	Axial	10°

3mm 90°

Face Milling

Fig 1

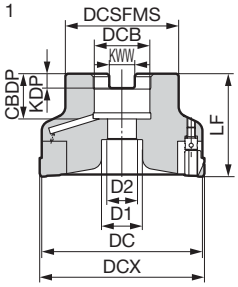


Fig 2

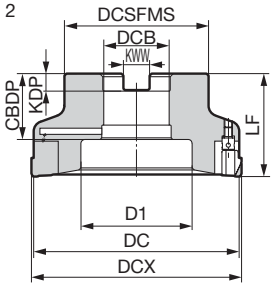
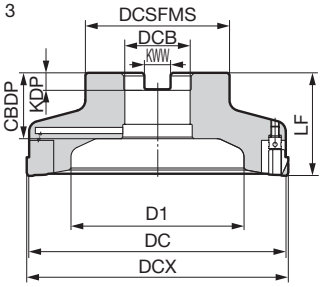


Fig 3



Body (Extra Fine Pitch: 3-Tooth/Inch) With Coolant Holes

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**HFFH 12080RS-22**	●	**80**	82	50	40	**22**	10.4	6.3	20	18	11	10	1.0	1
	12080RS-27	●	**80**	82	55	50	**27**	12.4	7	22	20	14	10	1.2	1
	12100RS-32	●	**100**	102	70	50	**32**	14.4	8	32	54	—	12	1.7	2
	12125RS-32	●	**125**	127	70	50	**32**	14.4	8	32	84	—	15	2.2	3
	12125RS-40	●	**125**	127	90	63	**40**	16.4	9	35	84	—	15	2.8	3
Inch	**HFFH 12080R-25.4**	●	**80**	82	50	50	**25.4**	9.5	6	30	35	—	10	1.0	2
	12100R-25.4	●	**100**	102	50	50	**25.4**	9.5	6	30	54	—	12	1.5	2
	12100R-31.75	●	**100**	102	70	50	**31.75**	12.7	8	32	54	—	12	1.7	2
	12125R-25.4	●	**125**	127	50	50	**25.4**	9.5	6	30	84	—	15	2.0	3
	12125R-31.75	●	**125**	127	70	50	**31.75**	12.7	8	32	84	—	15	2.2	3
	12125R-38.1	●	**125**	127	80	63	**38.1**	15.9	10	36	84	—	15	2.5	3

Blades are sold separately.

Blade

Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
NF-LDEN 12T3ZDFR-L	●	6.0	Linear	Low Cutting Force	1
12T3ZDFR-G	●	6.0	Arc-Shaped	General-purpose	1
12T3ZDTR-H	●	6.0	Arc-Shaped	Strong Edge	1
12T3ZDFR-GX	●	9.0	Arc-Shaped	Long Edge	2
12T3ZDFR-W	●	2.0	Arc-Shaped	Wiper	3

Fig 1

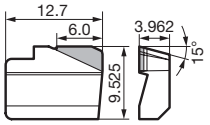


Fig 2

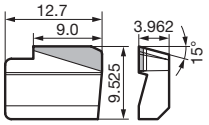
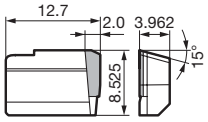


Fig 3 Wiper Blade



Parts

(Sold Separately)

Clamp Plate	Bolt		Wrench	Adjustment Screw	Wrench	Assembly Wrench
		N·m				
HFW	WB6-13T	**6.0**	TTX20	HFJ	RFT	HFVT

Identification Code

HF F H 12 080 R S - 22

Series Code	Extra Fine Pitch	With Oil Hole	Blade Size	Dia.	Feed Direction	Metric Bore	Hole Dia.

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	2,000- **2,500** -3,000	0.05- **0.13** -0.20	DA1000

Note
- The above are the recommended conditions for HF type overall. Use within the maximum allowable spindle speed.
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Si content of over 12.6%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	400- **600** -800	0.05- **0.13** -0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

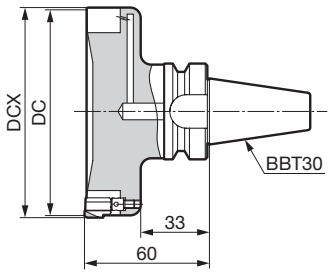
HFFH 12000R-BBT30 type

Rake Angle		
Radial	4°	
Axial	10°	

3mm 90°

Face Milling

Fig 1



Body (Extra Fine Pitch: 3-Tooth/Inch) With Coolant Holes

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Number of Teeth	Weight (kg)	Fig
Inch	**HFFH 12080R-BBT30**	●	**80**	82	10	1.6	1
	12100R-BBT30	●	**100**	102	12	2.4	1
	12125R-BBT30	●	**125**	127	15	2.6	1

Blades are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Blade

Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
NF-LDEN 12T3ZDFR-L	●	6.0	Linear	Low Cutting Force	1
12T3ZDFR-G	●	6.0	Arc-Shaped	General-purpose	1
12T3ZDTR-H	●	6.0	Arc-Shaped	Strong Edge	1
12T3ZDFR-GX	●	9.0	Arc-Shaped	Long Edge	2
12T3ZDFR-W	●	2.0	Arc-Shaped	Wiper	3

Fig 1

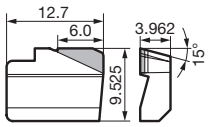


Fig 2

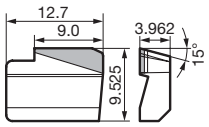
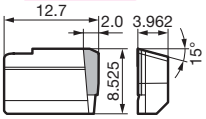


Fig 3 Wiper Blade



Parts

(Sold Separately)

Clamp Plate	Bolt		Wrench	Adjustment Screw	Wrench	Assembly Wrench
		N·m				
HFW	WB6-13T	6.0	TTX20	HFJ	RFT	HFVT

Identification Code

HF	F	H	12	080	R	-	BBT30
Series Code	Extra Fine Pitch	With Oil Hole	Blade Size	Dia.	Feed Direction		Supported Arbor Symbol

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	2,000- **2,500** -3,000	0.05- **0.13** -0.20	DA1000

Note
- The above are the recommended conditions for HF type overall. Use within the maximum allowable spindle speed.
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Si content of over 12.6%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	400- **600** -800	0.05- **0.13** -0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

* BIG-PLUS™ is a registered trademark of BIG DAISHOWA Co., Ltd.
* Can also be used with BT30 spindle machines.

N·m Recommended Tightening Torque (N·m)

RF series

■ Features

The RF series cutter has a lightweight body designed for high-speed, high-performance roughing to finish milling of aluminum alloys and other non-ferrous metals.

■ Work Material

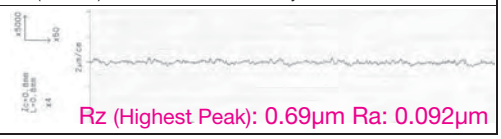
- Aluminum and aluminum alloys
- Other Non-Ferrous Metals

(Not suited for cast iron or steel.)

- **From Roughing to Finishing Processes:** Roughing: Economical carbide insert / Finishing: High-precision SUMIDIA insert
- **Strong and Lightweight Body:** Special aluminum alloy body. 40% lighter than steel cutters. Hard anodizing. Improved efficiency with higher spindle speeds, lower spindle loads and shorter tool change time
- **Safety Design:** Prevents inserts from dislodging from cutter due to centrifugal force. (Speeds must be within max. recommended conditions) To prevent warping, wedges are not used in the cutter construction
- **Easy Runout Adjustment:** External setting gauge is used for easy tool presetting. High-precision cutter construction - units fitted are within 10µm runout even before setting

■ Surface Finish

· Process: Finish Milling	· vc = 4,990m/min
· Machine: Vertical Machining Centre	· n = 15,900min^{-1}
· Arbor: HSK63A	· vf = 11,400mm/min
· Work Material: Si 10 to 12% Al Alloy	· fz = 0.12mm/t
· Cutter: RF4100R 6-Tooth (1 Wiper)	· ap = 0.5mm, Wiper ap = 0.03mm, Dry
· Grade: SUMIDIA (DA1000)	



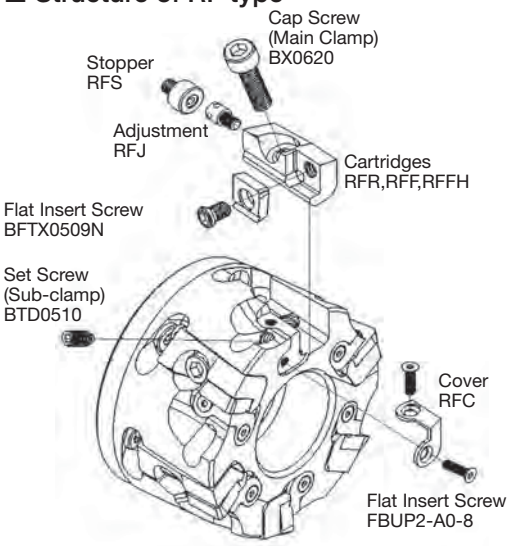
Rz (Highest Peak): 0.69µm Ra: 0.092µm

● Maximum Allowable Spindle Speed

Cat. No.	n max (min^{-1})
RF4080R	17,000
RF4100R	15,900
RF4125R	13,500
RF4160R	11,000
RF4200R	9,000
RF4250R	7,600
RF4315R	6,000

* The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

■ Structure of RF type



■ Recommended Cutting Conditions

Si content of 12% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	2,000-**2,500**-3,000	0.05-**0.13**-0.20	DA1000 DA2200
		300-**650**-1,000	0.05-**0.13**-0.20	H1

Note
- The above are the recommended conditions for RF type overall. Use within the maximum allowable spindle speed.
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Si content of over 12%

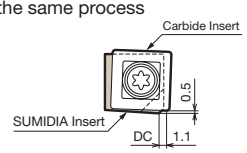
ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	400- **600** -800	0.05-**0.13**-0.20	DA1000 DA2200
		200- **300** -400	0.05-**0.13**-0.20	H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

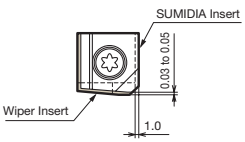
● Recommended Cutting Edge Position

We recommend positioning as in the figure below when mounting carbide inserts or SUMIDIA inserts (blades).

- When roughing and finishing in the same process



- When using wiper edge



■ Product Range

Type	Cat. No.	Dia. (mm)						
		ø80	ø100	ø125	ø160	ø200	ø250	ø315
Shell	RF 4000R (Inch)	6	6	8	10	12	16	18

Number in ●○ shows the number of teeth (Inch) Inch Bore

⚠ CAUTIONS (For more details, refer to the instruction manual included with the product)

As it is possible to mix different types of inserts/blades, it is important to take note of the following.

- Do not mix reground and new inserts or inserts with a different regrinding allowance on the same cutter.
- Carbide and SUMIDIA inserts must be arranged alternately.
- When using a combination of SUMIDIA blades and inserts, ensure proper balance by mounting the same type of cutting edges on opposite sides of the cutter.

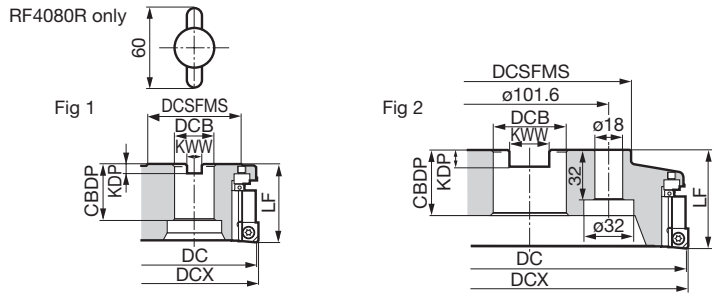
RF 4000R type

Rake Angle		
Radial	4°	
Axial	10°	

3mm 90° (SUMIDIA Insert)

10mm 87° (Carbide Insert)

Face Milling



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**RF 4080R**	●	**80**	82	60	50	**25.4**	9.5	6	30	6	0.7	1
	4100R	●	**100**	102	75	50	**31.75**	12.7	8	38	6	1.0	1
	4125R	●	**125**	127	75	63	**38.1**	15.9	10	38	8	1.6	1
	4160R	●	**160**	162	100	63	**50.8**	19.1	11	38	10	2.6	1
	4200R	●	**200**	202	130	63	**47.625**	25.4	14	42	12	3.6	2
	4250R		**250**	252	130	63	**47.625**	25.4	14	42	16	6.0	2
	4315R		**315**	317	240	80	**47.625**	25.4	14	42	18	11.0	2

Cartridges, blades and inserts are sold separately.
Use a flanged bolt to mount the cutter to the arbor.

Insert/Cartridge

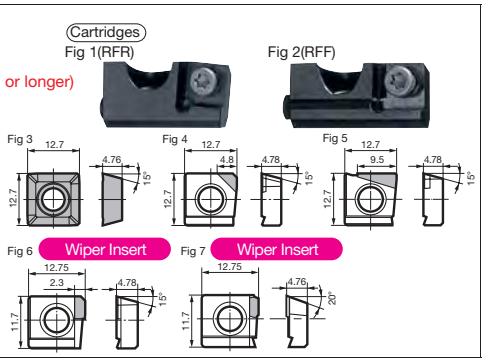
Dimensions (mm)

Grade Classification		Cemented Carbide	DLC	SUMIDIA		SUMICRYSTAL
Process	High-speed/Light Cutting	N	N	N	N	N
	General-purpose	N	N	N	N	
	Roughing	N	N	N	N	

Refer to page M64 for details of SUMICRYSTAL.

*When using large depth of cut (ap = 3mm or longer) with RF4080R, use the RFFH cartridge. (RFF is possible for normal cutting.)

Cat. No.	H1	DL1000	DA1000	DA2200	SC10	Fig	Cartridges Cat. No.	Cartridges Stock	Fig
SDET 1204ZDFR	●	●	—	—	—	3	RFR	●	1
NF-SNEW 1204ADFR	—	—	●	▲	—	4	RFF	●	2
120404ADFR-H	—	—	●	—	—	5	RFF (Others) *RFFH(RF4080R)	●	2
1204ADFR-W	—	—	●	▲	—	6	RFF	●	2
SNEW 1204ADFR-WS	—	—	—	—	●	7	RFF	●	2



An "H" at the end of the part number indicates large depth of cut type, while "W" or "WS" indicates a wiper insert.

Parts

Cover	Stopper	Cap Screw		Set Screw		Flat Insert Screw	Adjustment	Flat Insert Screw		Wrench	Wrench
		Main Clamp	N·m	Sub-clamp	N·m	Cover Mounting			N·m		
RFC	RFS	BX0620	10.0	BTD 0510	3.0	FBUP2-A0-8	RFJ	BFTX 0509N	5.0	TH050 TH025 RFT	TTX20

Blades/Dummy Blades

Product Name	Cat. No.	SUMIDIA DA2200
SUMIDIA Blade	RFB	●
SUMIDIA Wiper Blade	RFBW	●
Dummy Blade	RFD	●(Steel)

Use dummy blades for unused teeth to protect the body as well as maintaining balance.

Setting Parts

Cartridge design allows inserts to be attached outside the machine with high precision.

Setting Gauge
RF-SET
(Sold Separately/ Standard Stock)

Clamp Jig
RF-JIG
(Sold Separately/ Standard Stock)

*Dial gauge is not included.

Internal Coolant Attachments

For internal coolant supply, use an internal coolant holder or a commercially available clamp bolt with coolant holes.
Typical examples are given in the table below. For specifications, contact each manufacturer directly.

Body Cat. No.	Internal Coolant Holder	Standard Clamp Bolt with Coolant Hole (Example)	
		MST Corporation	BIG DAISHOWA
RF 4080R	—	MBC-M12	TMBA-M12
RF 4100R	—	MBC-M16	TMBA-M16
RF 4125R	—	MBC-M20	TMBA-M20
RF 4160R	—	MBC-M24	TMBA-M24
RF 4200R	RF-CLT	—	—
RF 4250R	RF-CLT	—	—
RF 4315R	RF-CLT	—	—

Direction of Coolant Streams

Internal Coolant Holders
RF-CLT (Standard Stock)

Standard Clamp Bolt with Coolant Hole [Typical Example] MBC-M12 to M24 (Sold Separately)

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SRF series

■ Features

The SRF type is ideal for aluminum alloy machining on high-performance small machines.

- **Ideal for small machines**
  Especially reliable on BT30 class small machines.
- **From roughing to finishing processes**
  Utilises SUMIDIA DA1000 inserts with effective cutting edge length of 5mm.
- **Economical NF type inserts:**
  NF type SUMIDIA inserts with tough DA1000 grade lower tooling costs.
- **High-speed cutting with SUMIDIA:**
  Maximum spindle speeds of up to n = 20,000min^{-1}
  (Please operate within the maximum allowable spindle speed of the machine and holder used)
  *The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.
- **Simple runout adjustment mechanism:**
  Simple direct insert mounting design with easy fine-adjustment for runout precision.

■ Recommended Cutting Conditions

Si content of 12% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	2,000- **3,000** -4,000	0.05-**0.13**-0.20	DA1000

Note
· The above are the recommended conditions for SRF type overall. Use within the maximum allowable spindle speed.
· The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Si content of over 12%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	400- **600** -800	0.05-**0.13**-0.20	DA1000

Note
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

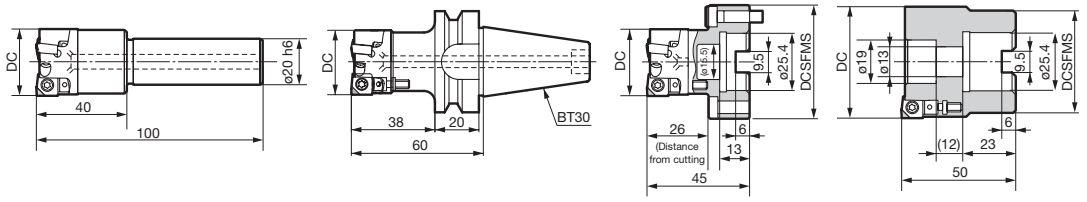
SRF series

Rake Angle		
Radial	-2° to 4°	
Axial	6°	

5mm 90°

Face Milling Shoulder Milling

Fig 1 Fig 2 Fig 3 Fig 4



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Number of Teeth	Weight (kg)	Fig
Inch	SRF 30R-ST	●	30	—	3	0.34	1
	40R-ST	●	40	—	4	0.50	1
	SRF 30R-BT30	●	30	—	3	0.57	2
	40R-BT30	●	40	—	4	0.72	2
	SRF 30R	●	30	50.0	3	0.27	3
	40R	●	40	50.0	4	0.35	3
	50R	●	*50	46.5	5	0.59	4
	63R	●	*63	45.0	6	0.67	4

Inserts are sold separately.

■ Product Range

Type	Cat. No.	Dia. (mm) ø30	ø40	ø50	ø63
Shell	SRF 30R(-ST)	3			
	SRF 40R(-ST)		4		
	SRF 30R-BT30	3			
	SRF 40R-BT30		4		
	SRF 50R (Inch)			5	
	SRF 63R (Inch)				6

Number in ● shows the number of teeth (Inch) Inch Bore

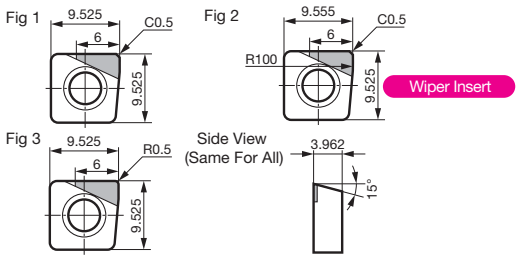
Note For mounting the cutters marked with * to an arbor, use a hex socket bolt (JIS B1176) M12 x 30 to 35mm.

Insert

Dimensions (mm)

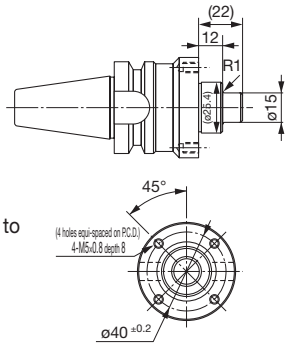
Grade Classification		SUMIDIA	
Process	High-speed/Light Cutting	N	N
	General-purpose	N	N
	Roughing	N	N

Cat. No.	DA1000	DA2200	Cutting Edge Shape	Fig
NF-SNEW 09T3ADTR	●	▲	Standard	1
09T3ADTR-U	●	▲	Wiper Flat	2
09T3ADTR-R	●	▲	Corner Radius	3



Recommended Cutting Conditions H242

- Standard inserts and wiper inserts can be used on the same cutter body.
- Standard inserts with corner radius should be used where chatter is present. These cannot be used with wiper inserts.
- Inserts can be reground 3 times (up to minimum IC diameter of 9.225mm), but the cutting edge height changes by the reground amount.
- Do not mix new and reground inserts or inserts with different regrind amounts on the same cutter.
- When using reground inserts, it is advisable to re-confirm cutting edge position with a tool pre-setter.
- Arbor for SRF30R, SRF40R



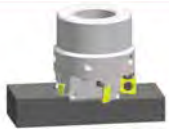
When using SRF30R and SRF40R cutters, the arbor needs to be modified as shown above.
(1. Reduce part of the arbor's adapter shaft length from ø25.4 to ø15. 2. Add 4 tap holes for (M5) mounting bolts.) Use hex socket bolts M5 × 20mm for securing the body.

Maximum Depth of Cut (SRF50R, 5-Tooth)

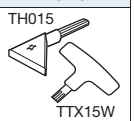
The table below contains guidelines on the maximum depth of cut, determined from internal tests. 'O' marks indicate the possible application range. Actual cutting conditions should be set based on the actual machine and workpiece characteristics.

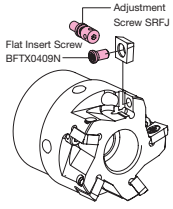
Depth of Cut ap (mm) \ Feed Rate	Feed Rate (vf) (mm/min) 2,500	4,000	5,000
	Feed Rate Per Tooth fz (mm/t) 0.05	0.08	0.10
0.5	○	○	○
1.0	○	○	○
1.5	○	○	○
2.0	○	○	○
2.5	○	○	○
3.0	○	○	○
3.5	○	○	—
4.0	○	—	—
4.5	○	—	—
5.0	○	—	—

Cutting Conditions
Cutter : SRF50R
Insert : NF-SNEW 09T3ADTR (DA1000)
n = 10,000min^{-1}
Arbor : BT30 FMA25.4-45
Workpiece : A-5052
Width : Maximum depth of cut at 35mm



Parts

Flat Insert Screw		Adjustment Screw	Wrench
	N·m		 TH015 TTX15W
BFTX0409N	4.0	SRFJ	TH015 TTX15W



N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

WAX series

Features

- Ideal for Roughing to Finishing of Non-ferrous Metals such as Aluminum Alloy
- Excellent Adhesion Resistance
  Top rake face of the insert has a lapped finish
  AURORA (DLC) Coat grade - DL1000,
  for improved adhesion resistance also available
- Safety Design
  Prevents dislodging of inserts caused by centrifugal force
- Coolant Compatible
  Coolant holes are a standard feature for the whole series

Product Range

Type	Cat. No.	Dia. (mm) ø20	ø25	ø32	ø40	ø50	ø63	ø80	ø100	ø125
Shell	WAX 3000-3.2					4	5			
	WAX 3000-3.2 inch							5	6	7
	WAX 3000-4.0					4	4			
	WAX 3000-4.0 inch							5	6	7
	WAX 4000-3.2					2	3			
	WAX 4000-3.2 inch							4	5	6
	WAX 4000-4.0					2	3			
	WAX 4000-4.0 inch							4	5	6
Shank	WAX 3000E-3.2	1	2	2	3					
	WAX 3000EL-3.2		2	2	3					
	WAX 3000E-4.0	1	2	2	3					
	WAX 3000EL-4.0		2	2	3					
	WAX 4000E-3.2		1	1	2					
	WAX 4000EL-3.2		1	1	2					
	WAX 4000E-4.0		1	1	2					
	WAX 4000EL-4.0		1	1	2					

Number in ●● shows the number of teeth inch Inch Bore

Grade Features

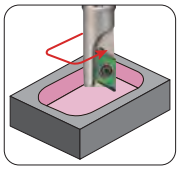
Work Material	Grade	Coating Thickness (μm)	Features
N Non-Ferrous Metal	DL1000	0.5	Coating with an extremely low coefficient of friction and excellent resistance to aluminum adhesion, provides stable cutting edge sharpness and chip evacuation. In combination with a dedicated carbide substrate for non-ferrous metals, wear resistance is further improved.

Grade Application Range

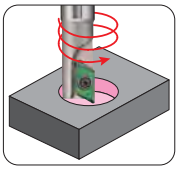
Work Material		Finishing to Light Cutting	Medium Cutting	Rough to Heavy Cutting
N Non-Ferrous Metal	Coated Carbide		DL1000	

Suitable for Various Applications

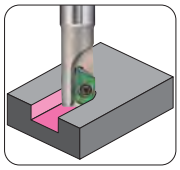
Pocket Expansion



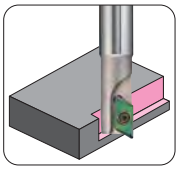
Helical Milling



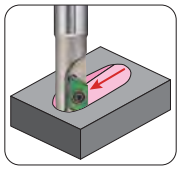
Groove Milling



Shoulder Milling

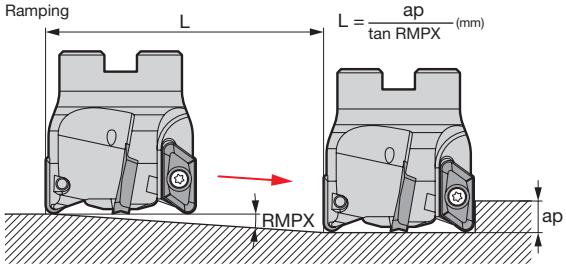


Ramping

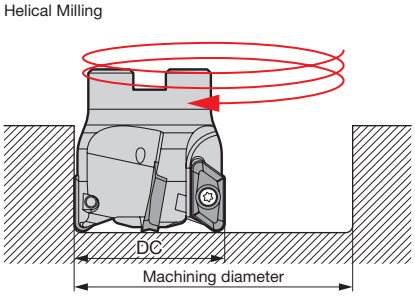


Ramping/Helical Milling Upper Limit and Allowable Maximum Spindle Speed

Ramping



Helical Milling



Dia. DC (mm)	Ramping: WAX3000 type Max. Ramping Angle RMPX (°)	Ramping: WAX4000 type Max. Ramping Angle RMPX (°)	Helical Milling: WAX3000 type Min. Machining Dia. (mm)	Helical Milling: WAX3000 type Max. Bore Dia. (mm)	Helical Milling: WAX4000 type Min. Machining Dia. (mm)	Helical Milling: WAX4000 type Max. Bore Dia. (mm)	Maximum Allowable Spindle Speed: WAX3000 type n max (min⁻¹)	WAX3000 type vc (m/min)	WAX4000 type n max (min⁻¹)	WAX4000 type vc (m/min)
20	28	—	22	33	—	—	14,000	880	—	—
25	17	26	29	43	27	43	29,000	2,200	11,000	860
32	12	18.5	43	57	38	57	25,000	2,500	9,000	900
40	9	13	59	73	54	73	23,000	2,900	20,000	2,500
50	7	9.5	79	93	74	93	20,000	3,100	18,000	2,800
63	5	7	105	119	100	119	18,000	3,500	16,000	3,100
80	3	5	139	153	134	153	16,000	4,000	14,000	3,500
100	3	4	179	193	174	193	14,000	4,400	12,000	3,700
125	2	3	229	243	224	243	13,000	5,100	11,000	4,300

*Maximum ramping angle (RMPX) depends on cutter diameter DC (mm). Minimum milling distance (L) for any depth of cut can be calculated by the equation above.
*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

WAX 3000 type

Rake Angle	Radial	6°
	Axial	19° to 25°

16 to 18 mm | 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1

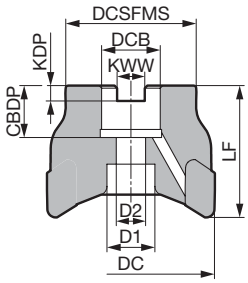
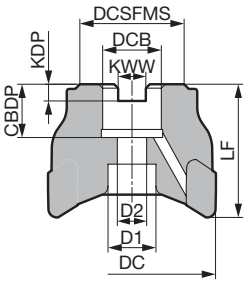


Fig 2



Body (Shell Type for RE = 3.2 and below)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WAX 3050-3.2**	●	**50**	**42**	50	**22**	10.4	6.3	21	18	11	4	0.34	1
	3063-3.2	●	**63**	**42**	50	**22**	10.4	6.3	21	18	11	5	0.6	2
Inch	**WAX 3080-3.2**	●	**80**	**57**	50	**25.4**	9.5	6	25	26	14	5	1.0	1
	3100-3.2	●	**100**	**67**	63	**31.75**	12.7	8	32	28	17	6	2.2	1
	3125-3.2	●	**125**	**87**	63	**38.1**	15.9	10	35	30	21	7	3.5	1

Body (Shell Type for RE = 4.0 and above)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WAX 3050-4.0**	●	**50**	**42**	50	**22**	10.4	6.3	21	18	11	4	0.34	1
	3063-4.0	●	**63**	**42**	50	**22**	10.4	6.3	21	18	11	4	0.6	2
Inch	**WAX 3080-4.0**	●	**80**	**57**	50	**25.4**	9.5	6	25	26	14	5	1.0	1
	3100-4.0	●	**100**	**67**	63	**31.75**	12.7	8	32	28	17	6	2.2	1
	3125-4.0	●	**125**	**87**	63	**38.1**	15.9	10	35	30	21	7	3.5	1

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

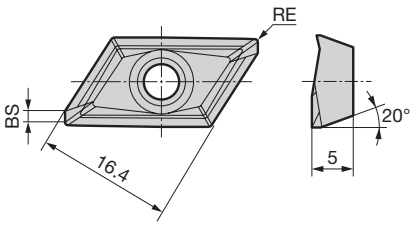
Insert

Dimensions (mm)

Grade Classification		Cemented Carbide	DLC
Process	High-speed/Light Cutting	N	N
	General-purpose		N
	Roughing		

Cat. No.	H1	DL1000	Max. Depth of Cut APMX	Wiper BS	Corner Radius RE	Fig
AECT 160404PEFRA	●	●	18	1.4	0.4	1
160408PEFRA	●	●	18	1.0	0.8	1
160412PEFRA	●	●	18	0.6	1.2	1
160416PEFRA	●	●	17.5	0.5	1.6	1
160420PEFRA	●	●	17.5	0.5	2.0	1
160430PEFRA	●	●	17	0.7	3.0	1
160432PEFRA	●	●	17	0.5	3.2	1
AECT 160440PEFRA	●	●	16.5	0.5	4.0	1
160450PEFRA	●	●	16	0.4	5.0	1

Fig 1



Inserts with a corner radius of RE = 4.0 or greater are for use with bodies that have a "-4.0" part number suffix.

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0408	**3.0**	TRD15	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	600-**900**-1,200	0.05-**0.15**-0.25	H1 DL1000

Note
- The above are the recommended conditions for WAX3000 type overall. Use within the maximum allowable spindle speed.
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- For groove milling, adjust the feed rate to around 70% of the above values.

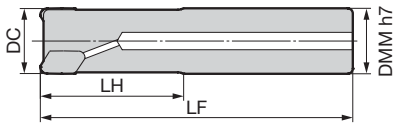
WAX 3000E/EL type

Rake Angle		
	Radial	6°
	Axial	19° to 25°

16 to 18 mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Body (Shank Type for RE = 3.2 and below)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Overall Length LF	Head LH	Number of Teeth	Weight (kg)	Fig
WAX 3020E -3.2	●	**20**	20	130	60	1	0.25	1
3025E -3.2	●	**25**	25	140	60	2	0.42	1
3025EL-3.2	●	**25**	25	200	60	2	0.63	1
3032E -3.2	●	**32**	32	150	70	2	0.75	1
3032EL-3.2	●	**32**	32	220	70	2	1.2	1
3040E -3.2	●	**40**	32	160	70	3	1.0	1
3040EL-3.2	●	**40**	32	220	70	3	1.4	1

Inserts are sold separately.

Body (Shank Type for RE = 4.0 and above)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Overall Length LF	Head LH	Number of Teeth	Weight (kg)	Fig
WAX 3020E -4.0	●	**20**	20	130	60	1	0.25	1
3025E -4.0	●	**25**	25	140	60	2	0.42	1
3025EL-4.0	●	**25**	25	200	60	2	0.63	1
3032E -4.0	●	**32**	32	150	70	2	0.75	1
3032EL-4.0	●	**32**	32	220	70	2	1.2	1
3040E -4.0	●	**40**	32	160	70	3	1.0	1
3040EL-4.0	●	**40**	32	220	70	3	1.4	1

Inserts are sold separately.

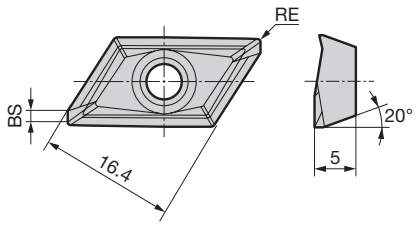
Insert

Dimensions (mm)

Grade Classification		Cemented Carbide	DLC
Process	High-speed/Light Cutting	N	N
	General-purpose		N
	Roughing		

Cat. No.	H1	DL1000	Max. Depth of Cut APMX	Wiper BS	Corner Radius RE	Fig
AECT 160404PEFRA	●	●	18	1.4	0.4	1
160408PEFRA	●	●	18	1.0	0.8	1
160412PEFRA	●	●	18	0.6	1.2	1
160416PEFRA	●	●	17.5	0.5	1.6	1
160420PEFRA	●	●	17.5	0.5	2.0	1
160430PEFRA	●	●	17	0.7	3.0	1
160432PEFRA	●	●	17	0.5	3.2	1
AECT 160440PEFRA	●	●	16.5	0.5	4.0	1
160450PEFRA	●	●	16	0.4	5.0	1

Fig 1



Inserts with a corner radius of RE = 4.0 or greater are for use with bodies that have a "-4.0" part number suffix.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WAX3020E type	BFTX0407K	3.0	TRD15	SUMI-P
Other than above	BFTX0408			

Recommended Cutting Conditions

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	600-**900**-1,200	0.05-**0.15**-0.25	H1 DL1000

Note
- The above are the recommended conditions for WAX3000 type overall. Use within the maximum allowable spindle speed.
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- For groove milling, adjust the feed rate to around 70% of the above values.

N·m Recommended Tightening Torque (N·m)

SEC-WaveMill

WAX 4000 type

Rake Angle		
	Radial	6°
	Axial	19° to 25°

22 to 24 mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1

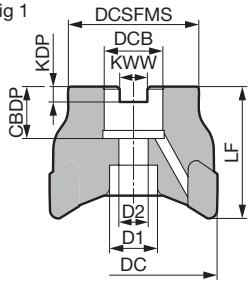


Fig 2

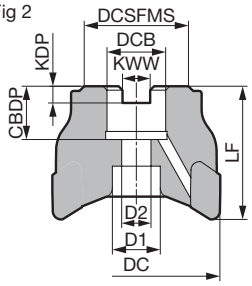
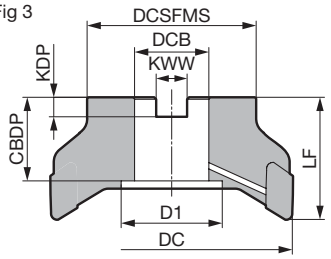


Fig 3



Body (Shell Type for RE = 3.2 and below)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WAX 4050-3.2**	●	**50**	**42**	50	**16**	8.4	5.6	18	14	9	2	0.37	1
	4063-3.2	●	**63**	**49**	50	**22**	10.4	6.3	21	18	11	3	0.54	2
Inch	**WAX 4080-3.2**	●	**80**	**57**	50	**25.4**	9.5	6	25	26	14	4	0.81	1
	4100-3.2	●	**100**	**67**	63	**31.75**	12.7	8	32	28	17	5	1.7	1
	4125-3.2	●	**125**	**87**	63	**38.1**	15.9	10	43	52	—	6	2.6	3

Inserts are sold separately.

Body (Shell Type for RE = 4.0 and above)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**WAX 4050-4.0**	●	**50**	**42**	50	**16**	8.4	5.6	18	14	9	2	0.38	1
	4063-4.0	●	**63**	**49**	50	**22**	10.4	6.3	21	18	11	3	0.54	2
Inch	**WAX 4080-4.0**	●	**80**	**57**	50	**25.4**	9.5	6	25	26	14	4	0.81	1
	4100-4.0	●	**100**	**67**	63	**31.75**	12.7	8	32	28	17	5	1.7	1
	4125-4.0	●	**125**	**87**	63	**38.1**	15.9	10	43	52	—	6	2.8	3

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

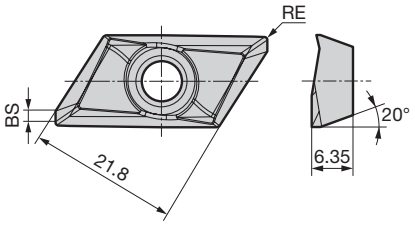
Insert

Dimensions (mm)

Grade Classification		Cemented Carbide	DLC
Process	High-speed/Light Cutting	N	N
	General-purpose		N
	Roughing		

Cat. No.	H1	DL1000	Max. Depth of Cut APMX	Wiper BS	Corner Radius RE	Fig
AECT 220604PEFRA	●	●	24	1.5	0.4	1
220608PEFRA	●	●	24	1.2	0.8	1
220612PEFRA	●	●	24	0.8	1.2	1
220616PEFRA	●	●	24	0.4	1.6	1
220620PEFRA	●	●	24	0.5	2.0	1
220630PEFRA	●	●	23	0.6	3.0	1
220632PEFRA	●	●	23	0.4	3.2	1
AECT 220640PEFRA	●	●	22	1.2	4.0	1
220650PEFRA	●	●	22	0.4	5.0	1

Fig 1



Inserts with a corner radius of RE = 4.0 or greater are for use with bodies that have a "-4.0" part number suffix.

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
BFTX0511N	**5.0**	TRD20	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	600-**900**-1,200	0.05-**0.15**-0.25	H1 DL1000

Note
- The above are the recommended conditions for WAX4000 type overall. Use within the maximum allowable spindle speed.
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- For groove milling, adjust the feed rate to around 70% of the above values.

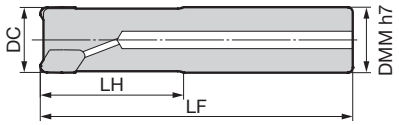
WAX 4000E/EL type

Rake Angle		
	Radial	6°
	Axial	19° to 25°

22 to 24 mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Body (RE = 3.2 or less)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WAX 4025E -3.2	●	**25**	25	60	140	1	0.41	1
4025EL-3.2	●	**25**	25	60	200	1	0.63	1
4032E -3.2	●	**32**	32	70	150	1	0.72	1
4032EL-3.2	●	**32**	32	70	220	1	1.2	1
4040E -3.2	●	**40**	32	70	160	2	0.88	1
4040EL-3.2	●	**40**	32	70	220	2	1.2	1

Body (RE = 4.0 or more)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Shank DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
WAX 4025E -4.0	●	**25**	25	60	140	1	0.41	1
4025EL-4.0	●	**25**	25	60	200	1	0.63	1
4032E -4.0	●	**32**	32	70	150	1	0.72	1
4032EL-4.0	●	**32**	32	70	220	1	1.2	1
4040E -4.0	●	**40**	32	70	160	2	0.88	1
4040EL-4.0	●	**40**	32	70	220	2	1.2	1

Inserts are sold separately.

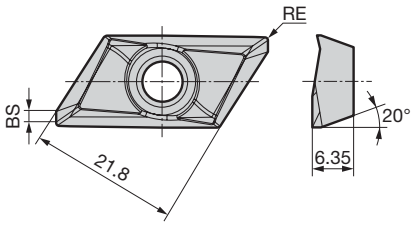
Insert

Dimensions (mm)

Grade Classification		Cemented Carbide	DLC
Process	High-speed/Light Cutting	N	N
	General-purpose		N
	Roughing		

Cat. No.	H1	DL1000	Max. Depth of Cut APMX	Wiper BS	Corner Radius RE	Fig
AECT 220604PEFRA	●	●	24	1.5	0.4	1
220608PEFRA	●	●	24	1.2	0.8	1
220612PEFRA	●	●	24	0.8	1.2	1
220616PEFRA	●	●	24	0.4	1.6	1
220620PEFRA	●	●	24	0.5	2.0	1
220630PEFRA	●	●	23	0.6	3.0	1
220632PEFRA	●	●	23	0.4	3.2	1
AECT 220640PEFRA	●	●	22	1.2	4.0	1
220650PEFRA	●	●	22	0.4	5.0	1

Fig 1



Inserts with a corner radius of RE = 4.0 or greater are for use with bodies that have a "-4.0" part number suffix.

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WAX4025E/EL type, WAX4032E/EL type	BFTX0509N	5.0	TRD20	SUMI-P
WAX4040E/EL type	BFTX0511N			

Recommended Cutting Conditions

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	600-**900**-1,200	0.05-**0.15**-0.25	H1 DL1000

Note
- The above are the recommended conditions for WAX4000 type overall. Use within the maximum allowable spindle speed.
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- For groove milling, adjust the feed rate to around 70% of the above values.

N·m Recommended Tightening Torque (N·m)

FMU series/FMU-E series

Expansion

Rake Angle	Radial	2°
	Axial	8°

0.5mm 45°

Face Milling

Fig 1

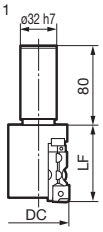


Fig 2

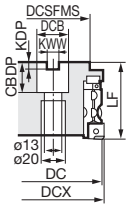


Fig 3

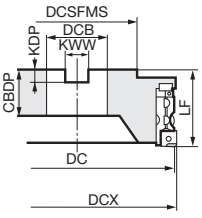


Fig 4

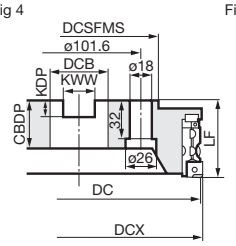
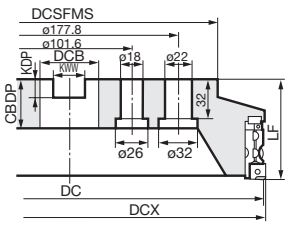


Fig 5



Body

Dimensions (mm)

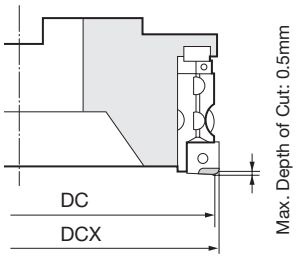
	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**FMU 4040ER**	●	37.2	**40**	—	63	—	—	—	—	2	1.0	1
	4050ER	●	47.2	**50**	—	63	—	—	—	—	3	1.2	1
	4063ER	●	60.2	**63**	60	63	**25.4**	9.5	6	25	4	1.0	2
	FMU 4080R	●	**80**	82.8	60	63	**25.4**	9.5	6	25	6	1.7	2
	4100R	●	**100**	102.8	76	63	**31.75**	12.7	8	38	8	2.5	3
	4125R	●	**125**	127.8	75	63	**38.1**	15.9	10	38	10	3.9	3
	4160R	●	**160**	162.8	100	63	**50.8**	19.1	11	38	12	6.3	3
	4200R	●	**200**	202.8	130	63	**47.625**	25.4	14	40	16	9.3	4
	4250R		**250**	252.8	130	63	**47.625**	25.4	14	40	20	14.5	4
	4315R		**315**	317.8	240	80	**47.625**	25.4	14	40	24	25.0	5

Inserts are sold separately.

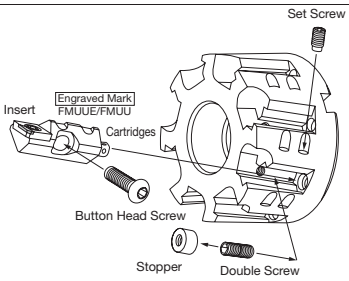
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Max. Depth of Cut

Approach Angle : 0°
Axial Rake Angle : +8°
Radial Rake Angle : +2°



Structure



Insert

Dimensions (mm)

Grade Classification		SUMIBORON			
Process	High-speed/Light Cutting	K	K	K	
	General-purpose	K	K	K	
	Roughing				
Cat. No.		New BN7125	BN7000	BN700	Fig
SNEW1203ADTR		○	●	▲	1
1203ADTR-S		○	●	▲	2

-S denotes a low-thrust insert.

Fig 1

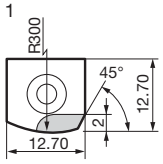
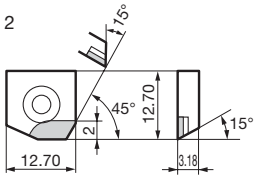


Fig 2



Cartridges

Cartridges	Flat Insert Screw		Adjustment Bolt	O-ring	Wrench	Wrench
		N·m			(For Flat Insert Screw)	
FMUU(E)*	BFTX0509N	**5.0**	FMUJ	P3	TTX20	TH015

* FMU4040ER/4050ER/4063ER use FMUUE type cartridges.

* FMUU/FMUUE are pre-assembled with flat screws and adjustment screws (with O-rings attached).

Setting Gauge

FMU-SET (Sold Separately)

*Dial gauge is not included.

Parts

Bolt	Set Screw	Stopper	Double Screw	Wrench	Wrench	Wrench (Radial)	Anti-seizure Cream
				(For Cartridges)	(For Set Screws)	(For Stoppers)	
BH0620*	BTD0609	FMUE	WB5-10	TH040	LH030	LH025	SUMI-P

*FMU4040ER, 4050ER and 4063ER use BH0615 bolts.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Grey Cast Iron	250HB	800- **1,400** -2,000	0.10- **0.20** -0.30	BN7125(Dry)

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

FM series/FMF series

Cast Iron

Expansion

Rake	Radial	2°
Angle	Axial	8°

0.5mm 45°

Face Milling

Fig 1

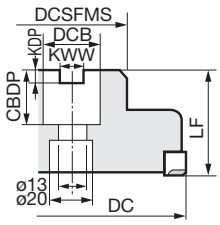


Fig 2

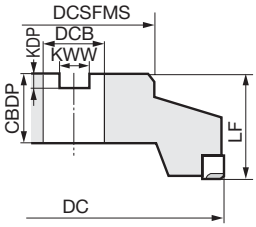


Fig 3

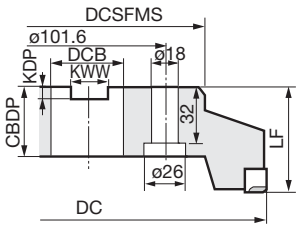
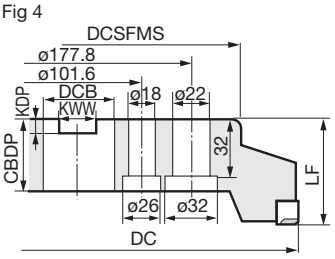


Fig 4



High-speed Finishing for Cast Iron

● Specially designed cutting edge shape combined with SUMIBORON grade for cast iron machining, realising high-speed milling of gray cast iron.

Body

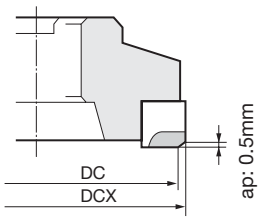
Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**FM 5080 R/L**	●		**80**	82.8	60	50	**25.4**	9.5	6	25	6	1.6	1
	5100 R/L	●		**100**	102.8	75	50	**31.75**	12.7	8	32	8	2.4	2
	5125 R/L	●		**125**	127.8	75	63	**38.1**	15.9	10	38	10	3.4	2
	5160 R/L	●		**160**	162.8	100	63	**50.8**	19.1	11	38	12	5.6	2
	5200 R/L			**200**	202.8	130	63	**47.625**	25.4	14	40	16	8.3	3
	5250 R/L			**250**	252.8	130	63	**47.625**	25.4	14	40	20	14.3	3
	5315 R/L			**315**	317.8	240	80	**47.625**	25.4	14	40	24	27.8	4
	FMF 5125 R/L			**125**	127.8	75	63	**38.1**	15.9	10	38	12	3.4	2
	5160 R/L			**160**	162.8	100	63	**50.8**	19.1	11	38	16	5.6	2
	5200 R/L			**200**	202.8	130	63	**47.625**	25.4	14	40	20	8.3	3
	5250 R/L			**250**	252.8	130	63	**47.625**	25.4	14	40	24	14.3	3
	5315 R/L			**315**	317.8	240	80	**47.625**	25.4	14	40	28	27.8	4

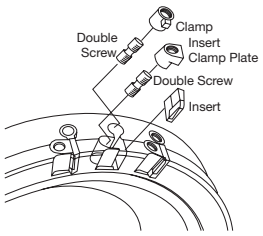
Inserts are sold separately.

Body

Approach Angle : 0°
Axial Rake Angle : +8°
Radial Rake Angle : +2°



Structure



Insert

Dimensions (mm)

Grade Classification		SUMIBORON						
Process	High-speed/Light Cutting	K		K		K		
	General-purpose	K		K		K		
	Roughing							
Cat. No.		New BN7125		BN7000		BN700		Fig
		R	L	R	L	R	L	
SNEN 1504ADT R/L		○		●		▲		1
1504ADT R/L-S		○		●		▲		2

Fig 1

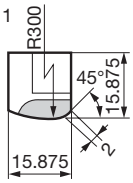
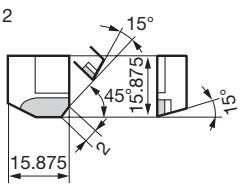


Fig 2



Parts

Applicable Cutter	Insert Clamp Plate	Adjustment Clamp	Adjustment Screw	Double Screw	Wrench	Wrench
FM5080R/L	FMW	—	FMJ	WB7F-20TL	TT25	1.8 x 45
FM5100R/L FM5315R/L		FME	—			—

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability) ○ mark: Stock or planned stock (please confirm stock availability)

RM series

Rake Angle		
	Radial	-6° 45'
	Axial	-5° 45'

3mm / 75°

Face Milling

Fig 1

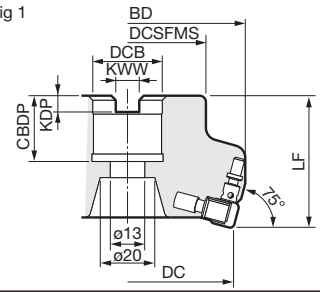
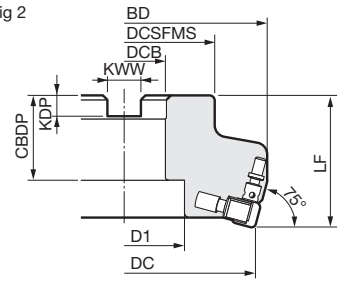


Fig 2



For High-speed, High-efficiency Milling of Cast Iron

● High-efficiency Milling of Gray Cast Iron
- Utilises Solid SUMIBORON for high-speed cutting of vc = 1,500m/min
- High speed roughing with depth of cut up to 3.0mm
- Wiper insert for high-speed finishing

● Low Cost
- Economical double-sided insert with 8 usable corners
- Insert can be reground and used again

● Simple Runout Adjustment Mechanism
- Simple design for direct insert mounting
- Easy yet precise runout precision adjustment

Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Maximum Spindle Speed (min⁻¹)	Weight (kg)	Fig
Inch	**RM 3080R**		**80**	90	60	50	**25.4**	9.5	6	25	—	6	9,000	1.6	1
	RM 3100R		**100**	110	70	50	**31.75**	12.7	8	32	46	8	8,000	2.1	2
	3125R		**125**	135	80	63	**38.1**	15.9	10	38	59	10	7,000	3.9	2
	3160R		**160**	170	100	63	**50.8**	19.1	11	38	80	12	6,000	5.9	2

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		SUMIBORON		
Process	High-speed/Light Cutting	K	K	
	General-purpose	K	K	
	Roughing	K	K	
Cat. No.		BNS8125	BNC8115	Fig
SNGN 090308		●	●	1
090312		●	●	1
SNEN 090308W		●	●	2

Fig 1

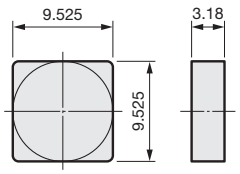
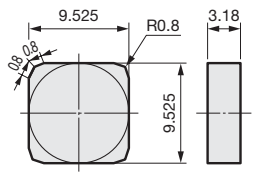
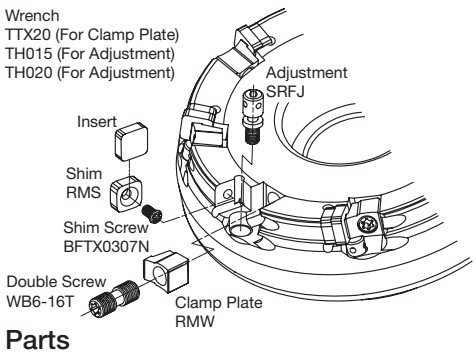


Fig 2 Wiper Insert





Parts

Shim	Shim Screw		Clamp Plate	Double Screw	Adjustment	Wrench (For Clamp Plate)	Wrench (For Adjustment)	Wrench (For Adjustment)
		N·m						
RMS	BFTX0307N	**2.0**	RMW	WB6-16T	SRFJ	TTX20	TH015	TH020

⚠ Precautions for Use

- Do not use inserts with different catalogue numbers, such as a mix of standard and wiper inserts, on a single cutter setting.
- New and reground inserts cannot be mixed for use. Use either only new inserts or only reground inserts.
- Inserts can only be reground once (inscribed circle dimension must be at least 9.125mm).

For hardened steel machining, use the SEC-ACE MILL DNF type.
Body: ☞H47 Insert: ☞L118

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Gray Cast Iron	250HB	800- **1,150** -1,500	0.05- **0.13** -0.20	BNS8125 (Dry)

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

MEMO

Modular Tools H

H253 to H274

		SEC-Modular Tools	H254
Shoulder Milling	For High-precision Milling of Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-WaveMill WEZ series	H256
	For High-feed Milling of Steel, Die Steel, Cast Iron, and Stainless Steel	New SEC-WaveMill WEZR series	H260
	For High-efficiency Milling of Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-WaveMill WEX series	H264
	For Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-WaveMill WFX series	H266
High-Feed	For High-precision Milling of Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	New SEC-Sumi Dual Mill DMSL series	H267
	For High-feed Milling of Steel, Die Steel, Cast Iron, and Stainless Steel	Expansion SEC-Sumi Dual Mill DMSW series	H268
	For High-feed Milling of Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-WaveMill WFXH series	H269
	For High Feed Milling of Steel, Cast Iron and Stainless Steel	SEC-Metal Slash Mill MSX series	H270
Radius	For Exotic Alloy	SEC-Wave Radius Mill RSX(F) series	H271
	For Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-Wave Radius Mill WRCX series	H272
Chamfering	For Chamfering of Steel, Die Steel, Cast Iron, Stainless Steel and Non-Ferrous Metal	SEC-WaveMill WFXC series	H273
Non-Ferrous Metals	For High-speed, High-efficiency Milling of Aluminum Alloy and Non-Ferrous Metal	Expansion ALNEX ANXS series	H274

Stock Markings and Symbols

●● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

Modular Tools

■ Features

- 12 indexable modular head types available!

WEZ type **DMSL type** **RSX type**
WEZR type **DMSW type** **WRCX type**
WEX type **WFXH type** **WFXC type**
WFX type **MSX type** **ANXS type**

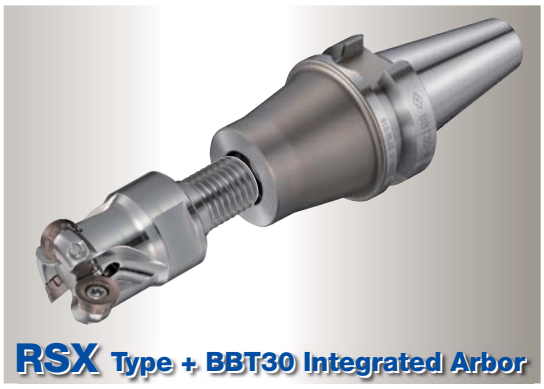
- In addition to carbide arbors and steel arbors, the lineup of integrated BBT types enables a variety of combinations
- General-purpose grade applicable to any work material Introducing the new grade ACU2500, which is applicable to a wide variety of processes and work materials such as steel, stainless steel and cast iron.

Suitable for milling with **long overhangs** *when combined with carbide or steel arbors*

When combined with BBT integrated arbors, **high load milling** *is supported*

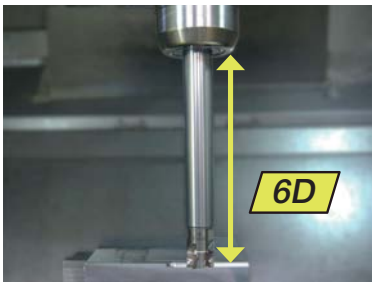
Easy-to-replace screw-on design.

WEX Type + Carbide Arbor

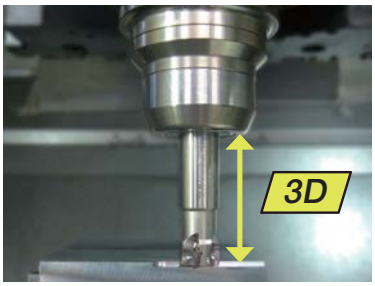


RSX Type + BBT30 Integrated Arbor

Modular type + Carbide Arbor



Standard type (Integrated Arbor)



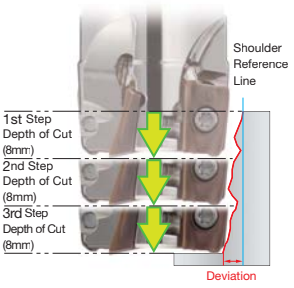
■ Screw Size and Mounting Cutter Size

Screw **CRKS**	Applicable Cutter Size (DC)
M8	ø16, ø18
M10	ø20, ø22
M12	ø24, ø28
M16	ø30, ø32, ø35, ø40

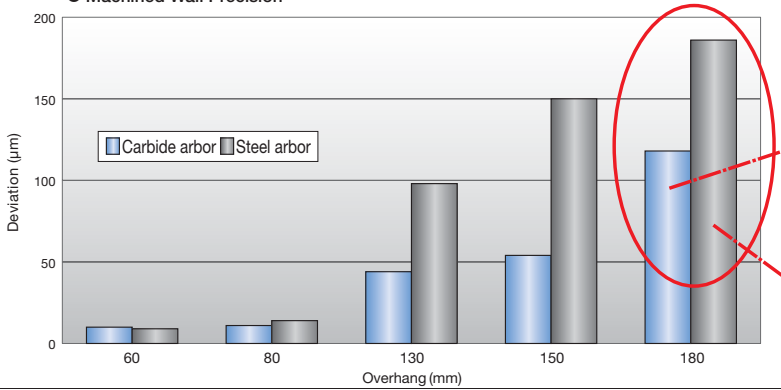
Note: Overhang varies depending on cutting conditions such as the tool used, machine rigidity and work clamp rigidity.

■ Cutting Performance

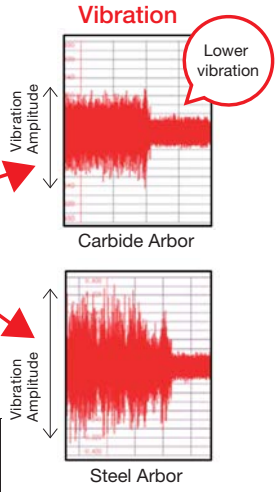
● Carbide arbors achieve greater precision and stable milling compared to steel arbors



● Machined Wall Precision



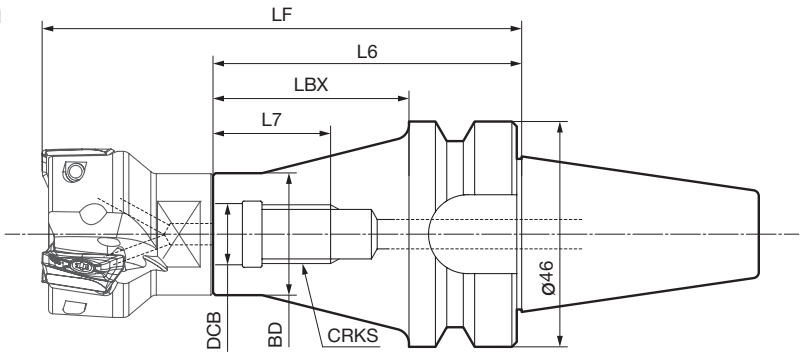
Vibration



Work Material	: S50C
Tool	: WEX2025M12Z4 (ø25 x 4-tooth)
Cutting Conditions	: vc = 100m/min fz = 0.1mm/t ap = 8mm × 3 times ae = 2.0mm Machine: Machining Centre BT50

BBT Integrated type - SEC-Modular Tools Special Arbors

Fig 1



BBT Integrated Arbor

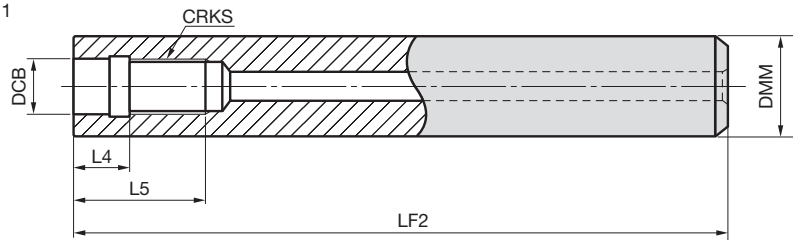
Dimensions (mm)

Cat. No.	Stock	Screw CRKS	Hole Dia. DCB	External Dia. BD	Body Overhang L6	Length LBX	Thread Depth L7	Overhang LF*1	Coolant Hole	Fig
BBT30-M8-50	●	**M8**	8.5	15.9	72	50	18	97	Yes	1
M10-45	●	**M10**	10.5	19.9	67	45	20	97	Yes	1
M12-40	●	**M12**	12.5	24.9	62	40	22	97	Yes	1
M16-35	●	**M16**	17	31.9	57	35	24	97	Yes	1

*1: Overhang length for LF is with head mounted.
Can also be used with BT30 spindle machines.
Note: The values in red have been changed from the 2021-2022 General Catalogue.

SEC-Modular Tools - Special Arbors (Carbide Arbor/Steel Arbor)

Fig 1



Carbide Arbor

Dimensions (mm)

Cat. No.	Stock	Screw CRKS	Hole Dia. DCB	Shank DMM	Overall Length LF2	Depth L4	Thread Depth L5	Overhang LF*2	Fig
MA15M08L120C	●	**M8**	8.5	15	120	10	18	145	1
15M08L160C	●	**M8**	8.5	15	160	10	18	185	1
16M08L120C	●	**M8**	8.5	16	120	10	18	145	1
16M08L160C	●	**M8**	8.5	16	160	10	18	185	1
MA18M10L150C	●	**M10**	10.5	18	150	10	20	180	1
18M10L200C	●	**M10**	10.5	18	200	10	20	230	1
20M10L150C	●	**M10**	10.5	20	150	10	20	180	1
20M10L200C	●	**M10**	10.5	20	200	10	20	230	1
MA23M12L200C	●	**M12**	12.5	23	200	10	22	235	1
23M12L250C	●	**M12**	12.5	23	250	10	22	285	1
25M12L200C	●	**M12**	12.5	25	200	10	22	235	1
25M12L250C	●	**M12**	12.5	25	250	10	22	285	1
MA28M16L200C	●	**M16**	17	28	200	10	24	240	1
28M16L300C	●	**M16**	17	28	300	10	24	340	1
32M16L200C	●	**M16**	17	32	200	10	24	240	1
32M16L300C	●	**M16**	17	32	300	10	24	340	1

Steel Arbor

Dimensions (mm)

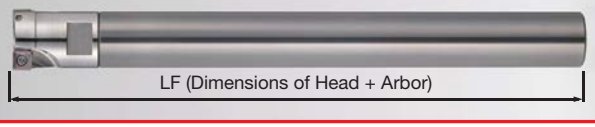
Cat. No.	Stock	Screw CRKS	Hole Dia. DCB	Shank DMM	Overall Length LF2	Depth L4	Thread Depth L5	Overhang LF*2	Fig
MA16M08L120S	●	**M8**	8.5	16	120	10	18	145	1
20M10L150S	●	**M10**	10.5	20	150	10	20	180	1
25M12L200S	●	**M12**	12.5	25	200	10	22	235	1
32M16L200S	●	**M16**	17	32	200	10	24	240	1

Identification Code

MA 15 M08 L120 C

Series Code	Shank Dia.	Mounting Screw Size	Arbor Overall Length	Arbor Materials C: Carbide S: Steel

● Set Dimensions (*2)

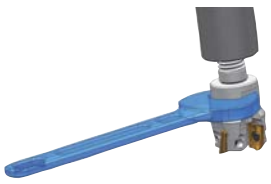


Recommended Tightening Torque (N·m)

***Take care when tightening the head.**

· When mounting the head to an arbor, follow the standard tightening torque in the table below.
· Check the mounting screw size for the head and arbor beforehand.

Screw Size	Regulated Tightening Torque (N·m)
M8	**23**
M10	**46**
M12	**60**
M16	**80**



WEZ 11000M type

SEC-Modular Tool

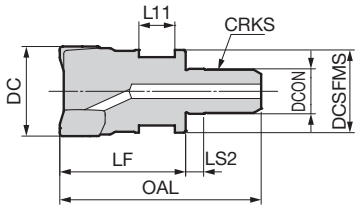
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

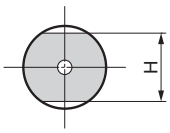
Rake Angle	Radial	-7° to -18°
	Axial	6° to 15°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1





Head

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
WEZ 11016M08Z2	●	**16**	14.5	8.5	**M8**	42(41.7)	25(24.7)	5	8	13	2	0.03	1
11018M08Z2	●	**18**	14.5	8.5	**M8**	42(41.7)	25(24.7)	5	8	13	2	0.03	1
11020M10Z2	●	**20**	18.0	10.5	**M10**	49(48.7)	30(29.7)	5	8	15	2	0.06	1
11020M10Z3	●	**20**	18.0	10.5	**M10**	49(48.7)	30(29.7)	5	8	15	3	0.05	1
11022M10Z3	●	**22**	18.0	10.5	**M10**	49(48.7)	30(29.7)	5	8	15	3	0.06	1
11025M12Z2	●	**25**	23.0	12.5	**M12**	56(55.7)	35(34.7)	5	10	19	2	0.11	1
11025M12Z3	●	**25**	23.0	12.5	**M12**	56(55.7)	35(34.7)	5	10	19	3	0.10	1
11025M12Z4	●	**25**	23.0	12.5	**M12**	56(55.7)	35(34.7)	5	10	19	4	0.10	1
11026M12Z4	●	**26**	23.0	12.5	**M12**	56(55.7)	35(34.7)	5	10	19	4	0.10	1
11026M12Z5	●	**26**	23.0	12.5	**M12**	56(55.7)	35(34.7)	5	10	19	5	0.09	1
11028M12Z4	●	**28**	23.0	12.5	**M12**	56(55.7)	35(34.7)	5	10	19	4	0.11	1
11028M12Z5	●	**28**	23.0	12.5	**M12**	56(55.7)	35(34.7)	5	10	19	5	0.10	1
11030M16Z2	●	**30**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	2	0.20	1
11030M16Z4	●	**30**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	4	0.19	1
11030M16Z5	●	**30**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	5	0.17	1
11032M16Z2	●	**32**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	2	0.22	1
11032M16Z3	●	**32**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	3	0.20	1
11032M16Z4	●	**32**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	4	0.20	1
11032M16Z5	●	**32**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	5	0.19	1
11035M16Z2	●	**35**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	2	0.24	1
11035M16Z5	●	**35**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	5	0.22	1
11040M16Z2	●	**40**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	2	0.28	1
11040M16Z4	●	**40**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	4	0.26	1
11040M16Z5	●	**40**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	5	0.26	1
11040M16Z6	●	**40**	28.5	17	**M16**	63(62.7)	40(39.7)	5	10	24	6	0.25	1

The OAL and LF dimensions in parentheses are dimensions using RE = 3.0/3.2 insert. When using RE = 3.0/3.2 inserts, the maximum depth of cut is 9.5mm.
Inserts are sold separately.

Arbors H255

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEZ11016M08Z2, WEZ11018M08Z2	BFTX0305IP	1.5	TRDR08IP	SUMI-P
WEZ11020M10Z2 to WEZ11040M16Z6	BFTX0306IP			

Identification Code

WEZ Series Code | **11** Insert Size | **016** Dia. | **M08** Mounting Screw Size | **Z2** Number of Teeth

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ11 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT11T324PEER)
Corner radius = 3.0: C2.5
(AOMT11T330PEER)
Corner radius = 3.2: C2.5
(AOMT11T332PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		PKM	P		K	K		MS		N	P		
	General-purpose	PKMS	PKM		P	K		K	MS	MS	N	N		
	Roughing	PKMS			P			K		MS				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT	11T302PEER-G	●	●		●	●		●	●	●	—	—	●	0.2	1
	11T304PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
	11T305PEER-G	●							●	●	—	—		0.5	1
	11T308PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
	11T310PEER-G	●							●	●	—	—		1.0	1
	11T312PEER-G	●	●		●	●		●	●	●	—	—		1.2	1
	11T316PEER-G	●	●		●	●		●	●	●	—	—		1.6	1
	11T320PEER-G	●	●		●	●		●	●	●	—	—		2.0	1
	11T324PEER-G	●							●	●	—	—		2.4	1
	11T330PEER-G	●	●		●	●		●	●	●	—	—		3.0	2
	11T332PEER-G	●							●	●	—	—		3.2	2
AOMT	11T304PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
	11T308PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
	11T312PEER-H	●							●	●	—	—	—	1.2	1
	11T316PEER-H	●							●	●	—	—	—	1.6	1
AOET	11T302PEER-F	●		—			—		—		—	—	—	0.2	1
	11T304PEER-F	●		—			—		—		—	—	—	0.4	1
	11T305PEER-F	●		—			—		—		—	—	—	0.5	1
	11T308PEER-F	●		—			—		—		—	—	—	0.8	1
	11T310PEER-F	●		—			—		—		—	—	—	1.0	1
	11T312PEER-F	●		—			—		—		—	—	—	1.2	1
	11T316PEER-F	●		—			—		—		—	—	—	1.6	1
	11T320PEER-F	●		—			—		—		—	—	—	2.0	1
	11T324PEER-F	●		—			—		—		—	—	—	2.4	1
	11T330PEER-F	●		—			—		—		—	—	—	3.0	2
	11T332PEER-F	●		—			—		—		—	—	—	3.2	2
AOET	11T302PEER-P16	●		—			—		—		—	—	—	0.2	1
	11T304PEER-P16	●		—			—		—		—	—	—	0.4	1
	11T305PEER-P16	●		—			—		—		—	—	—	0.5	1
	11T308PEER-P16	●		—			—		—		—	—	—	0.8	1
	11T310PEER-P16	●		—			—		—		—	—	—	1.0	1
	11T312PEER-P16	●		—			—		—		—	—	—	1.2	1
AOET	11T302PEER-P20	●		—			—		—		—	—	—	0.2	1
	11T304PEER-P20	●		—			—		—		—	—	—	0.4	1
	11T305PEER-P20	●		—			—		—		—	—	—	0.5	1
	11T308PEER-P20	●		—			—		—		—	—	—	0.8	1
	11T310PEER-P20	●		—			—		—		—	—	—	1.0	1
	11T312PEER-P20	●		—			—		—		—	—	—	1.2	1
AOET	11T302PEER-P25	●		—			—		—		—	—	—	0.2	1
	11T304PEER-P25	●		—			—		—		—	—	—	0.4	1
	11T305PEER-P25	●		—			—		—		—	—	—	0.5	1
	11T308PEER-P25	●		—			—		—		—	—	—	0.8	1
	11T310PEER-P25	●		—			—		—		—	—	—	1.0	1
	11T312PEER-P25	●		—			—		—		—	—	—	1.2	1
AOET	11T302PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
	11T304PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
	11T305PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
	11T308PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
	11T310PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
	11T312PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
	11T316PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
	11T320PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
	11T324PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
	11T330PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.0	2
	11T332PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.2	2

Fig 1

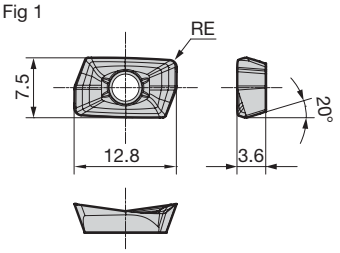
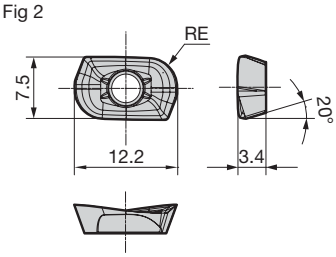


Fig 2



-G: General-purpose, -H: Strong Edge, -F: Medium Finishing,
-P16/-P20/-P25: High-precision Machining, -S: Non-Ferrous Metals.
* -P16 is applicable to cutter diameters ø14 and ø16. -P20 is applicable to cutter diameters ø18 and ø20.
-P25 is applicable to cutter diameters ø25 and ø28.

Recommended Cutting Conditions H58 Maximum Allowable Spindle Speed H59
Precautions for Mounting Inserts H55

● mark: Standard stocked item (new product/expanded item)

WEZ 17000M type

SEC-Modular Tool

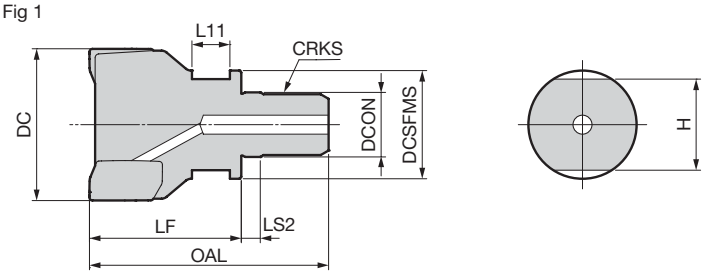
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-6° to -12°
	Axial	6° to 15°

15mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
WEZ 17025M12Z2	●	**25**	23.0	12.5	**M12**	56(55.3)	35(34.3)	5	10	19	2	0.08	1
17025M12Z3	●	**25**	23.0	12.5	**M12**	56(55.3)	35(34.3)	5	10	19	3	0.07	1
17028M12Z2	●	**28**	23.0	12.5	**M12**	56(55.3)	35(34.3)	5	10	19	2	0.10	1
17030M16Z2	●	**30**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	2	0.17	1
17030M16Z3	●	**30**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	3	0.15	1
17032M16Z2	●	**32**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	2	0.19	1
17032M16Z3	●	**32**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	3	0.16	1
17032M16Z4	●	**32**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	4	0.14	1
17035M16Z2	●	**35**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	2	0.21	1
17035M16Z3	●	**35**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	3	0.19	1
17040M16Z2	●	**40**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	2	0.25	1
17040M16Z3	●	**40**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	3	0.23	1
17040M16Z4	●	**40**	28.5	17	**M16**	63(62.3)	40(39.3)	5	10	24	4	0.21	1

The OAL and LF dimensions in parentheses are dimensions using RE = 5.0/6.4 insert. When using RE = 5.0/6.4 inserts, the maximum depth of cut is 14.5mm.
Inserts are sold separately.

Arbors H255

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEZ17025M12Z2 to WEZ17030M16Z3	BFTX0407IP	3.0	TRDR15IP	SUMI-P
WEZ17032M16Z2 to WEZ17040M16Z4	BFTX0409IP			

Identification Code

WEZ	17	025	M12	Z2
Series Code	Insert Size	Dia.	Mounting Screw Size	Number of Teeth

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ17 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT170524PEER)
Corner radius = 3.0: C1.5
(AOMT170530PEER)
Corner radius = 3.2: C1.5
(AOMT170532PEER)
Corner radius = 4.0: C2
(AOMT170540PEER)
Corner radius = 5.0: C5
(AOMT170550PEER)
Corner radius = 6.4: C5
(AOMT170564PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		PKM	P		K	K		MS		N	P		
	General-purpose	KSM	PKM		P	K		K	MS	MS	N	N		
	Roughing	PKSM			P			K		MS				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT	170502PEER-L	●		—			—		●	●	—	—		0.2	1
	170504PEER-L	●	●	—	●	●	—	●	●	●	—	—	●	0.4	1
	170508PEER-L	●	●	—	●	●	—	●	●	●	—	—	●	0.8	1
	170512PEER-L	●		—			—		●	●	—	—		1.2	1
	170516PEER-L	●		—			—		●	●	—	—		1.6	1
AOMT	170502PEER-G	●	●		●	●		●	●	●	—	—		0.2	1
	170504PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
	170505PEER-G	●							●	●	—	—		0.5	1
	170508PEER-G	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
	170510PEER-G	●							●	●	—	—		1.0	1
	170512PEER-G	●	●		●	●		●	●	●	—	—		1.2	1
	170516PEER-G	●	●		●	●		●	●	●	—	—		1.6	1
	170520PEER-G	●	●		●	●		●	●	●	—	—		2.0	1
	170524PEER-G	●							●	●	—	—		2.4	1
	170530PEER-G	●	●		●	●		●	●	●	—	—		3.0	1
	170532PEER-G	●	●		●	●		●	●	●	—	—		3.2	1
	170540PEER-G	●	●		●	●		●	●	●	—	—		4.0	1
	170550PEER-G	●	●		●	●		●	●	●	—	—		5.0	2
	170564PEER-G	●							●	●	—	—		6.4	2
AOMT	170504PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
	170508PEER-H	●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
	170512PEER-H	●							●	●	—	—	—	1.2	1
	170516PEER-H	●							●	●	—	—	—	1.6	1
AOET	170502PEER-F	●		—			—		—		—	—	—	0.2	1
	170504PEER-F	●		—			—		—		—	—	—	0.4	1
	170505PEER-F	●		—			—		—		—	—	—	0.5	1
	170508PEER-F	●		—			—		—		—	—	—	0.8	1
	170510PEER-F	●		—			—		—		—	—	—	1.0	1
	170512PEER-F	●		—			—		—		—	—	—	1.2	1
	170516PEER-F	●		—			—		—		—	—	—	1.6	1
	170520PEER-F	●		—			—		—		—	—	—	2.0	1
	170524PEER-F	●		—			—		—		—	—	—	2.4	1
	170530PEER-F	●		—			—		—		—	—	—	3.0	1
	170532PEER-F	●		—			—		—		—	—	—	3.2	1
	170540PEER-F	●		—			—		—		—	—	—	4.0	1
	170550PEER-F	●		—			—		—		—	—	—	5.0	2
	170564PEER-F	●		—			—		—		—	—	—	6.4	2
AOET	170502PEER-P25	●		—			—		—		—	—	—	0.2	1
	170504PEER-P25	●		—			—		—		—	—	—	0.4	1
	170505PEER-P25	●		—			—		—		—	—	—	0.5	1
	170508PEER-P25	●		—			—		—		—	—	—	0.8	1
	170510PEER-P25	●		—			—		—		—	—	—	1.0	1
	170512PEER-P25	●		—			—		—		—	—	—	1.2	1
AOET	170502PEER-P32	●		—			—		—		—	—	—	0.2	1
	170504PEER-P32	●		—			—		—		—	—	—	0.4	1
	170505PEER-P32	●		—			—		—		—	—	—	0.5	1
	170508PEER-P32	●		—			—		—		—	—	—	0.8	1
	170510PEER-P32	●		—			—		—		—	—	—	1.0	1
	170512PEER-P32	●		—			—		—		—	—	—	1.2	1
AOET	170502PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
	170504PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
	170505PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
	170508PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
	170510PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
	170512PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
	170516PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
	170520PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
	170524PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
	170530PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.0	1
	170532PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	3.2	1
	170540PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	4.0	1
	170550PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	5.0	2
	170564PEFR-S	—	—	—	—	—	—	—	—	—	●	●	—	6.4	2

Fig 1

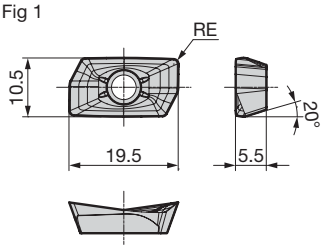
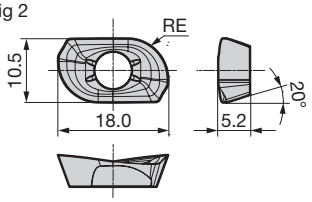


Fig 2



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge,
-F: Medium Finishing, -P25/-P32: High-precision Machining, -S: Non-Ferrous Metals.
* -P25 is applicable to cutter diameters ø25 and ø28. -P32 is applicable to cutter diameters ø30, ø32 and ø35.

Recommended Cutting Conditions ☞H58 Maximum Allowable Spindle Speed ☞H59
Precautions for Mounting Inserts ☞H55

● mark: Standard stocked item (new product/expanded item)

WEZR 11000M type

SEC-Modular Tool

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

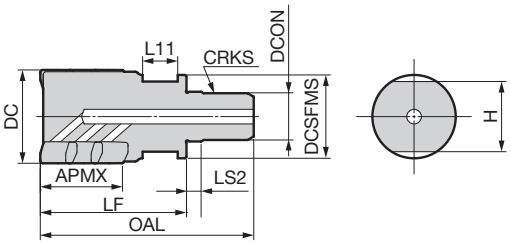
New

Rake Angle	Radial	-12°
	Axial	11°

27mm 90°

Shoulder Milling | Groove Milling | Side Milling

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
WEZR 11032M1627Z3	●	**32**	27(26)	28.5	17	**M16**	73(72.7)	50(49.7)	5	12	24	9	3	3	0.21	1

The APMX, OAL and LF dimensions in parentheses are dimensions using RE = 3.0/3.2 insert. Inserts are sold separately.

Arbors H255

Parts

Flat Insert Screw		Integrated Wrench	Anti-seizure Cream
	N·m		
BFTX0306IP	**1.5**	TRDR08IP	SUMI-P

Identification Code

WEZR	11	032	M16	27	Z3
Series Code	Insert Size	Dia.	Mounting Screw Size	Max. Depth of Cut	Effective No. of Teeth

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ11 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT11T324PEER)
Corner radius = 3.0: C2.5
(AOMT11T330PEER)
Corner radius = 3.2: C2.5
(AOMT11T332PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		PKM	P		K	K		MS		N	P		
	General-purpose	PKMS	PKM		P	K		K	MS	MS	N	N		
	Roughing	PKMS			P			K		MS				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 11T302PEER-G		●	●		●	●		●	●	●	—	—	●	0.2	1
11T304PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
11T305PEER-G		●							●	●	—	—		0.5	1
11T308PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
11T310PEER-G		●							●	●	—	—		1.0	1
11T312PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
11T316PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
11T320PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
11T324PEER-G		●							●	●	—	—		2.4	1
11T330PEER-G		●	●		●	●		●	●	●	—	—		3.0	2
11T332PEER-G		●							●	●	—	—		3.2	2
AOMT 11T304PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
11T308PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
11T312PEER-H		●							●	●	—	—	—	1.2	1
11T316PEER-H		●							●	●	—	—	—	1.6	1
AOET 11T302PEER-F		●		—			—		—		—	—	—	0.2	1
11T304PEER-F		●		—			—		—		—	—	—	0.4	1
11T305PEER-F		●		—			—		—		—	—	—	0.5	1
11T308PEER-F		●		—			—		—		—	—	—	0.8	1
11T310PEER-F		●		—			—		—		—	—	—	1.0	1
11T312PEER-F		●		—			—		—		—	—	—	1.2	1
11T316PEER-F		●		—			—		—		—	—	—	1.6	1
11T320PEER-F		●		—			—		—		—	—	—	2.0	1
11T324PEER-F		●		—			—		—		—	—	—	2.4	1
11T330PEER-F		●		—			—		—		—	—	—	3.0	2
11T332PEER-F		●		—			—		—		—	—	—	3.2	2
AOET 11T302PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
11T304PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
11T305PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
11T308PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
11T310PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
11T312PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
11T316PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
11T320PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
11T324PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
11T330PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	2
11T332PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	2

Fig 1

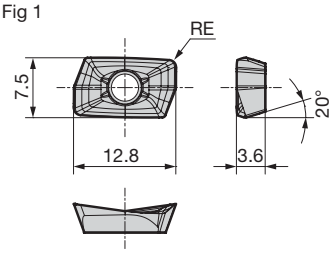
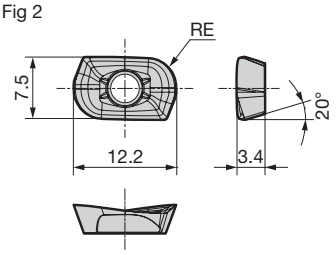


Fig 2



-G: General-purpose, -H: Strong Edge, -F: Medium Finishing,
-S: Non-Ferrous Metals.
Use peripheral inserts with RE of 0.8mm or less from the second stage and above.

Recommended Cutting Conditions H82
Precautions for Mounting Inserts H55

WEZR 17000M type

SEC-Modular Tool

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

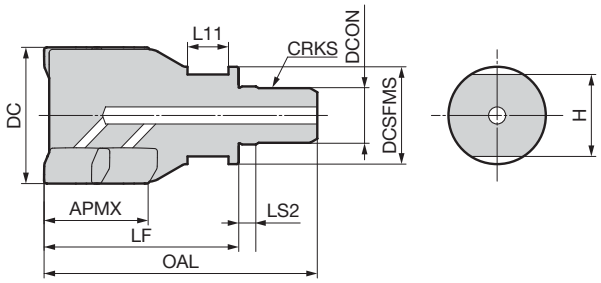
New

Rake Angle	Radial	-9°
	Axial	10°

29mm 90°

Shoulder Milling | Groove Milling | Side Milling

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Max. Depth of Cut APMX	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Total No. of Teeth	No. of Stages	Effective No. of Teeth	Weight (kg)	Fig
WEZR 17040M1629Z3	●	**40**	29(28)	28.5	17	**M16**	80(79.3)	57(56.3)	5	12	24	6	2	3	0.29	1

The APMX, OAL and LF dimensions in parentheses are dimensions using RE = 5.0/6.4 insert. Inserts are sold separately.

Arbors H255

Parts

Flat Insert Screw		Integrated Wrench	Anti-seizure Cream
BFTX0409IP	3.0	TRDR15IP	SUMI-P

Identification Code

WEZR	17	040	M16	29	Z3
Series Code	Insert Size	Dia.	Mounting Screw Size	Max. Depth of Cut	Effective No. of Teeth

* Modification of the cutter body is required when using inserts with corner radius RE 2.4 or larger.

Modify the C chamfering portion.

WEZ17 type

Reworking guidelines
Corner radius = 2.4: C1
(AOMT170524PEER)
Corner radius = 3.0: C1.5
(AOMT170530PEER)
Corner radius = 3.2: C1.5
(AOMT170532PEER)
Corner radius = 4.0: C2
(AOMT170540PEER)
Corner radius = 5.0: C5
(AOMT170550PEER)
Corner radius = 6.4: C5
(AOMT170564PEER)

Standard: R1.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide								Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting		PKM	P		K	K		MS		N	P		
	General-purpose	PKMS	PKM		P	K		K	MS	MS	N	N		
	Roughing	PKMS			P			K		MS				
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	Corner Radius RE	Fig
AOMT 170502PEER-L		●		—			—		●	●	—	—		0.2	1
170504PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.4	1
170508PEER-L		●	●	—	●	●	—	●	●	●	—	—	●	0.8	1
170512PEER-L		●		—			—		●	●	—	—		1.2	1
170516PEER-L		●		—			—		●	●	—	—		1.6	1
AOMT 170502PEER-G		●	●		●	●		●	●	●	—	—		0.2	1
170504PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
170505PEER-G		●							●	●	—	—		0.5	1
170508PEER-G		●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
170510PEER-G		●							●	●	—	—		1.0	1
170512PEER-G		●	●		●	●		●	●	●	—	—		1.2	1
170516PEER-G		●	●		●	●		●	●	●	—	—		1.6	1
170520PEER-G		●	●		●	●		●	●	●	—	—		2.0	1
170524PEER-G		●							●	●	—	—		2.4	1
170530PEER-G		●	●		●	●		●	●	●	—	—		3.0	1
170532PEER-G		●	●		●	●		●	●	●	—	—		3.2	1
170540PEER-G		●	●		●	●		●	●	●	—	—		4.0	1
170550PEER-G		●	●		●	●		●	●	●	—	—		5.0	2
170564PEER-G		●							●	●	—	—		6.4	2
AOMT 170504PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.4	1
170508PEER-H		●	●	●	●	●	●	●	●	●	—	—	—	0.8	1
170512PEER-H		●							●	●	—	—	—	1.2	1
170516PEER-H		●							●	●	—	—	—	1.6	1
AOET 170502PEER-F		●		—			—		—		—	—	—	0.2	1
170504PEER-F		●		—			—		—		—	—	—	0.4	1
170505PEER-F		●		—			—		—		—	—	—	0.5	1
170508PEER-F		●		—			—		—		—	—	—	0.8	1
170510PEER-F		●		—			—		—		—	—	—	1.0	1
170512PEER-F		●		—			—		—		—	—	—	1.2	1
170516PEER-F		●		—			—		—		—	—	—	1.6	1
170520PEER-F		●		—			—		—		—	—	—	2.0	1
170524PEER-F		●		—			—		—		—	—	—	2.4	1
170530PEER-F		●		—			—		—		—	—	—	3.0	1
170532PEER-F		●		—			—		—		—	—	—	3.2	1
170540PEER-F		●		—			—		—		—	—	—	4.0	1
170550PEER-F		●		—			—		—		—	—	—	5.0	2
170564PEER-F		●		—			—		—		—	—	—	6.4	2
AOET 170502PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
170505PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.5	1
170508PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
170510PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.0	1
170512PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.2	1
170516PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	1.6	1
170520PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.0	1
170524PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	2.4	1
170530PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.0	1
170532PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	3.2	1
170540PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	4.0	1
170550PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	5.0	2
170564PEFR-S		—	—	—	—	—	—	—	—	—	●	●	—	6.4	2

Fig 1

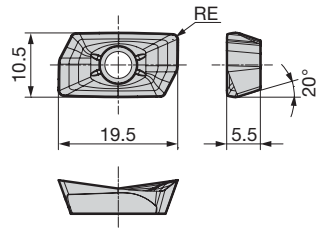
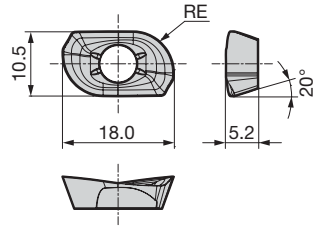


Fig 2



-L: Low Cutting Force, -G: General-purpose, -H: Strong Edge,
-F: Medium Finishing, -S: Non-Ferrous Metals.
Use peripheral inserts with RE of 0.8mm or less from the second stage and above.

Recommended Cutting Conditions H84 Precautions for Mounting Inserts H55

WEX 2000M type

SEC-Modular Tool

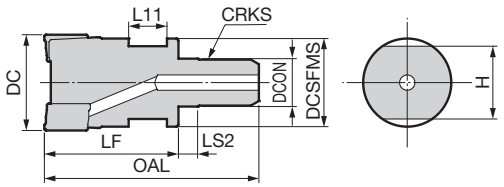
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle		
	Radial	10° to 18°
	Axial	14° to 25°

10mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
WEX 2016M08Z2	●	**16**	15.0	8.5	**M8**	42	25	5	8	13	2	1
2018M08Z2	●	**18**	15.0	8.5	**M8**	42	25	5	8	13	2	1
2020M10Z3	●	**20**	18.0	10.5	**M10**	49	30	5	8	15	3	1
2022M10Z3	●	**22**	18.0	10.5	**M10**	49	30	5	8	15	3	1
2025M12Z4	●	**25**	23.0	12.5	**M12**	56	35	5	10	19	4	1
2028M12Z4	●	**28**	23.0	12.5	**M12**	56	35	5	10	19	4	1
2030M16Z4	●	**30**	28.5	17.0	**M16**	63	40	5	10	24	4	1
2032M16Z5	●	**32**	28.5	17.0	**M16**	63	40	5	10	24	5	1
2040M16Z6	●	**40**	28.5	17.0	**M16**	63	40	5	10	24	6	1

Inserts are sold separately.

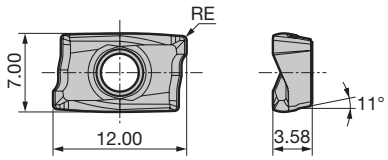
Arbors H255

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light Cutting	P			K		M S		K N	N		
	General-purpose		P M	P M	K		M S	M S		N		
	Roughing		P M	P M		K		M S				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 123504PEER-G		●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-G		●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-G		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-H		●	●	●	●	●	—	—	—	—	0.4	1
123508PEER-H		●	●	●	●	●	—	—	—	—	0.8	1
123512PEER-H		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 123504PEER-E		—	—	—	—	—	●	●	—	—	0.4	1
123508PEER-E		—	—	—	—	—	●	●	—	—	0.8	1
123512PEER-E		—	—	—	—	—	●	●	—	—	1.2	1
AXMT 123508PEER-EH		—	—	—	—	—	●	●	—	—	0.8	1
AXET 123502PEFR-S		—	—	—	—	—	—	—	●	●	0.2	1
123504PEFR-S		—	—	—	—	—	—	—	●	●	0.4	1
123508PEFR-S		—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



-G: General-purpose, -H: Strong Edge, -E, -EH: Exotic Alloy, -S: Aluminum Alloy.

Recommended Cutting Conditions H88

Identification Code

WEX 2 016 M08 Z2

Series Code	Insert Size	Dia.	Mounting Screw Size	Number of Teeth
WEX	2	016	M08	Z2

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEX2016M, WEX2018M	BFTX0305IP	2.0	TRDR08IP	SUMI-P
WEX2020M to WEX2040M	BFTX0306IP			

N·m Recommended Tightening Torque (N·m)

WEX 3000M type

SEC-Modular Tool

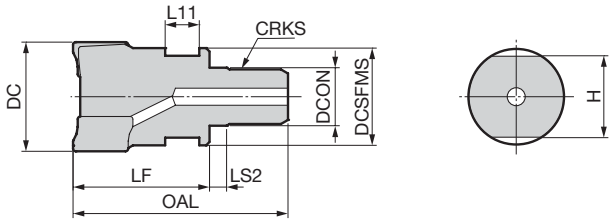
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	8° to 15°
	Axial	16° to 24°

14mm 90°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Side Milling | Plunge Milling | Helical Milling

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
WEX 3025M12Z2	●	**25**	23.0	12.5	**M12**	56	35	5	10	19	2	1
3028M12Z2	●	**28**	23.0	12.5	**M12**	56	35	5	10	19	2	1
3030M16Z3	●	**30**	28.5	17.0	**M16**	63	40	5	10	24	3	1
3032M16Z3	●	**32**	28.5	17.0	**M16**	63	40	5	10	24	3	1
3035M16Z3	●	**35**	28.5	17.0	**M16**	63	40	5	10	24	3	1
3040M16Z4	●	**40**	28.5	17.0	**M16**	63	40	5	10	24	4	1

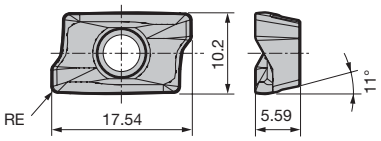
Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide							Carbide	DLC		
Process	High-speed/Light Cutting	P			K		M S		K N	N		
	General-purpose		P M	P M	K		M S	M S		N		
	Roughing		P M	P M		K		M S				
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Corner Radius RE	Fig
AXMT 170508PEER-L		●	●	●	●	●	—	—	—	—	0.8	1
AXMT 170504PEER-G		●	●	●	●	●	—	—	—	—	0.4	1
170508PEER-G		●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-G		●	●	●	●	●	—	—	—	—	1.2	1
170516PEER-G		●	●	●	●	●	—	—	—	—	1.6	1
170520PEER-G*		●	●	●	●	●	—	—	—	—	2.0	1
170530PEER-G*		●	●	●	●	●	—	—	—	—	3.0	1
AXMT 170508PEER-H		●	●	●	●	●	—	—	—	—	0.8	1
170512PEER-H		●	●	●	●	●	—	—	—	—	1.2	1
AXMT 170504PEER-E		—	—	—	—	—	●	●	—	—	0.4	1
170508PEER-E		—	—	—	—	—	●	●	—	—	0.8	1
170512PEER-E		—	—	—	—	—	●	●	—	—	1.2	1
170516PEER-E		—	—	—	—	—	●	●	—	—	1.6	1
170520PEER-E*		—	—	—	—	—	●	●	—	—	2.0	1
170530PEER-E*		—	—	—	—	—	●	●	—	—	3.0	1
AXMT 170508PEER-EH		—	—	—	—	—	●	●	—	—	0.8	1
AXET 170502PEFR-S		—	—	—	—	—	—	—	●	●	0.2	1
170504PEFR-S		—	—	—	—	—	—	—	●	●	0.4	1
170508PEFR-S		—	—	—	—	—	—	—	●	●	0.8	1

Fig 1



-L: Low Cutting force, -G: General-purpose, -H: Strong Edge, -E, -EH: Exotic Alloy, -S: Aluminum Alloy.
* marked inserts require modification of the cutter body.

Recommended Cutting Conditions H89

Identification Code

WEX **3** **025** **M12** **Z2**

Series Code	Insert Size	Dia.	Mounting Screw Size	Number of Teeth

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WEX3025M to WEX3030M	BFTX0407IP	3.0	TRDR15IP	SUMI-P
WEX3032M to WEX3040M	BFTX0409IP			

N·m Recommended Tightening Torque (N·m)

WFX 08000M type

SEC-Modular Tool

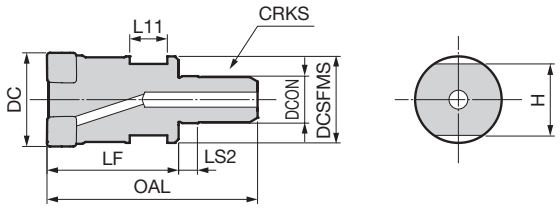
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy

Rake Angle	Radial	-6°
	Axial	12°

6mm 90°

Face Milling | Shoulder Milling | Groove Milling | Side Milling | Plunge Milling

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
WFX 08020M10Z2	●	**20**	18.0	10.5	**M10**	49	30	5	8	15	2	1
08022M10Z2	●	**22**	18.0	10.5	**M10**	49	30	5	8	15	2	1
08025M12Z2	●	**25**	23.0	12.5	**M12**	56	35	5	10	19	2	1
08028M12Z2	●	**28**	23.0	12.5	**M12**	56	35	5	10	19	2	1
08030M16Z3	●	**30**	28.5	17.0	**M16**	63	40	5	10	24	3	1
08032M16Z3	●	**32**	28.5	17.0	**M16**	63	40	5	10	24	3	1
08040M16Z3	●	**40**	28.5	17.0	**M16**	63	40	5	10	24	3	1

Inserts are sold separately.

Arbors H255

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	PS PM	PK PM	P			K	K		MS		KN	N			
	General-purpose	PS PM	PK PM		PM	PM	K	K		MS	MS		N	PM		
	Roughing	PS PM			PM	PM			K		MS			P		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
XOEW 080308PZTR-W		●	—	—	—	—	—		●			—	—	●	—	2

Refer to H109 (Precautions when Using Wiper Inserts) (Mounting Precautions).

Recommended Cutting Conditions H115

Fig 1

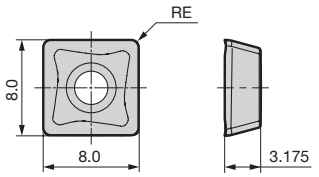
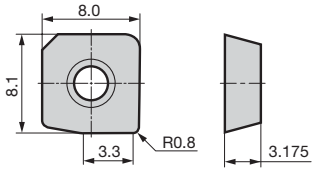


Fig 2 Wiper Insert



Identification Code

WFX **08** **020** **M10** **Z2**

Series Code	Insert Size	Dia.	Mounting Screw Size	Number of Teeth

Parts

Flat Insert Screw		Wrench	Anti-seizure Cream
	N·m		
BFTX0306IP	**2.0**	TRDR08IP	SUMI-P

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

DMSL 06000M type

SEC-Modular Tool

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy | H Hardened Steel

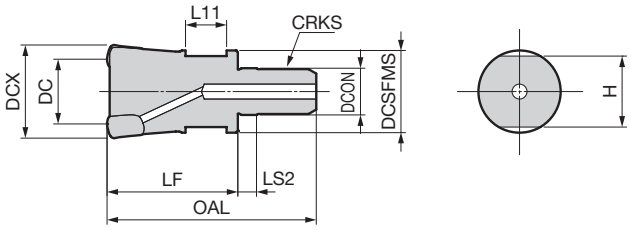
New

Rake Angle	Radial	-12.5° to -16.5°
	Axial	-8°

1.5mm, 17°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
DMSL 06016M08Z2	●	**16**	8.4	14.5	8.5	**M8**	42	25	5	8	13	2	0.03	1
06018M08Z2	●	**18**	10.4	14.5	8.5	**M8**	42	25	5	8	13	2	0.03	1
06020M10Z3	●	**20**	12.4	18	10.5	**M10**	49	30	5	10	15	3	0.05	1
06020M10Z4	●	**20**	12.4	18	10.5	**M10**	49	30	5	10	15	4	0.05	1
06022M10Z3	●	**22**	14.3	18	10.5	**M10**	49	30	5	10	15	3	0.06	1
06022M10Z4	●	**22**	14.3	18	10.5	**M10**	49	30	5	10	15	4	0.06	1
06025M12Z4	●	**25**	17.3	22	12.5	**M12**	56	35	5	11	19	4	0.10	1
06025M12Z5	●	**25**	17.3	22	12.5	**M12**	56	35	5	11	19	5	0.10	1
06026M12Z4	●	**26**	18.3	22	12.5	**M12**	56	35	5	11	19	4	0.10	1
06028M12Z4	●	**28**	20.3	22	12.5	**M12**	56	35	5	11	19	4	0.11	1
06028M12Z5	●	**28**	20.3	22	12.5	**M12**	56	35	5	11	19	5	0.11	1
06030M16Z5	●	**30**	22.3	28.5	17	**M16**	63	40	5	12	24	5	0.18	1
06032M16Z5	●	**32**	24.3	28.5	17	**M16**	63	40	5	12	24	5	0.20	1
06032M16Z6	●	**32**	24.3	28.5	17	**M16**	63	40	5	12	24	6	0.20	1
06035M16Z5	●	**35**	27.3	28.5	17	**M16**	63	40	5	12	24	5	0.21	1
06040M16Z6		**40**	32.3	28.5	17	**M16**	63	40	5	12	24	6	0.25	1
06042M16Z6		**42**	34.3	28.5	17	**M16**	63	40	5	12	24	6	0.26	1

Inserts are sold separately.

Arbors H255

Parts

Flat Insert Screw		Integrated Wrench	Anti-seizure Cream
BFTX02507IP	**2.0**	TRDR08IP	SUMI-P

Identification Code

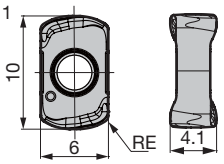
DMSL Series Code | **06** Insert Size | **025** Max. Dia. | **M12** Mounting Screw Size | **Z4** Number of Teeth

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										
Process	High-speed/Light Cutting		P M	P		K		M S				
	General-purpose	P K M S	P M	P	P	K	K	M S	M S	M S		
	Roughing	P K M S			P		K		M S	M S		
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	ACK2000	ACK3000	XCS2000	ACS2500	ACS3000	Corner Radius RE	Fig
LNMU 06T3ZNER-G		●	●	●	●	●	●	●	●	●	1.0	1

Fig 1



Recommended Cutting Conditions H171

DMSW 08000M type

SEC-Modular Tool

P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy | H Hardened Steel

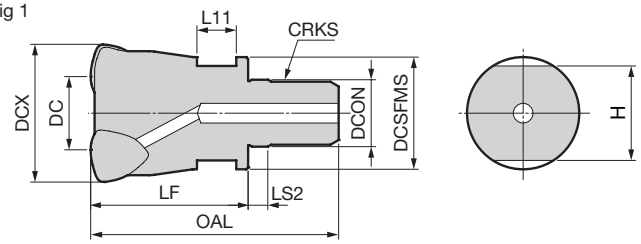
Expansion

Rake Angle	Radial	-11° to -13°
	Axial	-6°

3mm 15°

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
DMSW 08035M16Z2	●	**35**	18.6	28.5	17	**M16**	63	40	5	10	24	2	0.19	1
08040M16Z3	●	**40**	23.5	28.5	17	**M16**	63	40	5	10	24	3	0.21	1
08042M16Z3		**42**	25.5	28.5	17	**M16**	63	40	5	10	24	3	0.23	1

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

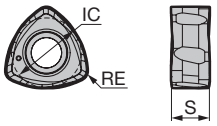
Arbors H255

Insert

Dimensions (mm)

Grade Classification		Coated Carbide											
Process	High-speed/Light Cutting		P M	P	K		M S						
	General-purpose	S P	P M	P	P	K	K	M S	M S	M S			
	Roughing	S P			P		K		M S	M S			
Cat. No.		ACU2500	XCU2500	ACP2000	ACP3000	ACK2000	ACK3000	XCS2000	ACS2500	ACS3000	Inscribed Circle IC	Thickness S	Corner Radius RE	Fig
WNMU 0807ZNER-L		●		●	●			●	●	●	13	7	1.6	1
WNMU 0807ZNER-G		●	●	●	●	●	●	●	●	●	13	7	1.6	1
WNMU 0807ZNER-H		●		●	●			●	●	●	13	7	1.6	1

Fig 1



Recommended Cutting Conditions H173

Identification Code

DMSW **08** **040** **M16** **Z3**

DMSW	08	040	M16	Z3
Series Code	Insert Size	Max. Dia.	Mounting Screw Size	Number of Teeth

Parts

Flat Insert Screw		Integrated Wrench	Anti-seizure Cream
	N·m		
BFTX0513IP	**5.0**	TRDR20IP	SUMI-P

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

WFXH 08000M/12000M type

SEC-Modular Tool

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy | H Hardened Steel

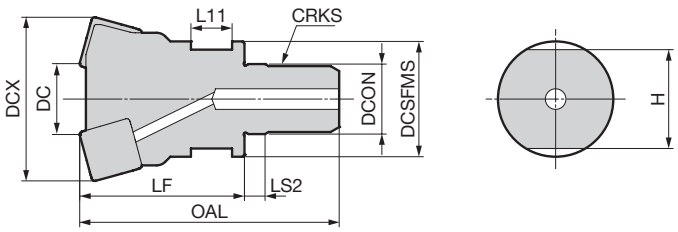
(WFXH08000M)

Rake Angle	Radial	-6°
	Axial	6°

1.5mm 15° (08000M type) | 2.5mm 15° (12000M type)

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1



Head (Applicable Insert SOMT08 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
WFXH 08025M12Z2	●	25	11.5	23.0	12.5	M12	56	35	5	10	19	2	0.1	1
08032M16Z3	●	32	18.5	28.5	17.0	M16	63	40	5	10	24	3	0.2	1

* indicates value with corner radius 1.2 inserts mounted.
Refer to H175 for details.

Head (Applicable Insert SOMT12 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
WFXH 12040M16Z3	●	40	18.1	28.0	17.0	M16	63	40	5	10	24	3	0.2	1

Inserts are sold separately.

Arbors H255

* indicates value with corner radius 1.6 inserts mounted.
Refer to H175 for details.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting	K M S	P K M	P			K	K		M S		K N	N			
	General-purpose	K M S	P K M		P M	P M	K	K		M S	M S		N	P M		
	Roughing	K M S			P M	P M			K		M S			P		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
SOMT 120408PDER-L		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	2
SOMT 120404PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	0.4	2
120408PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	2
120412PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.2	2
120416PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.6	2
120408PDER-H		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	2
SOET 120408PDFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	2

Fig 1

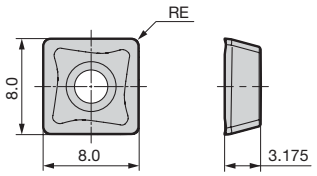
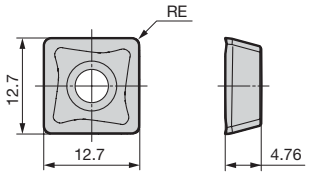


Fig 2



Recommended Cutting Conditions H176 | Precautions for Use H175

Identification Code

WFXH **08** **025** **M12** **Z2**

Series Code	Insert Size	Max. Dia.	Mounting Screw Size	Number of Teeth

Parts

Applicable Cutter	Flat Insert Screw		Wrench	Anti-seizure Cream
WFXH08000M	BFTX0306IP	2.0	TRDR08IP	SUMI-P
WFXH12000M	BFTX03512IP	3.0	TRDR15IP	

MSX 06000M/08000M/12000M type

SEC-Modular Tool

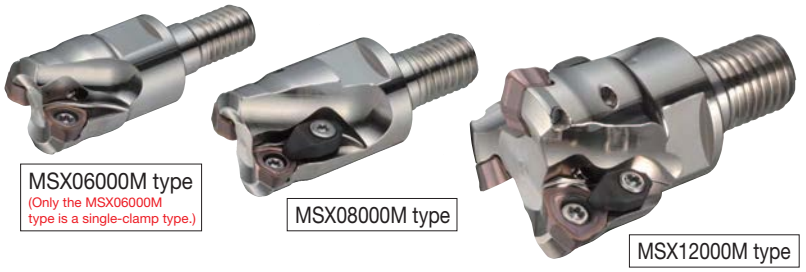
P Steel | M Stainless Steel | K Cast Iron | H Hardened Steel

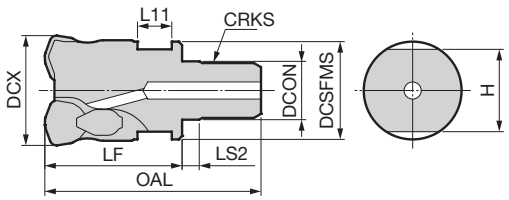
Rake Angle		
	Radial	-3° to -6°
	Axial	8°

1.0mm 20° (06000M type) | 1.5mm 20° (08000M type) | 2.0mm 20° (12000M type)

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Plunge Milling | Helical Milling

Fig 1





Head (Applicable Insert WDMT06 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
MSX 06016M08Z2	●	**16**	15.0	8.5	**M8**	42	25	5	8	13	2	1
06018M08Z2	●	**18**	15.0	8.5	**M8**	42	25	5	8	13	2	1
MSX 06020M10Z3	●	**20**	18.0	10.5	**M10**	49	30	5	8	15	3	1
06022M10Z3	●	**22**	18.0	10.5	**M10**	49	30	5	8	15	3	1
06025M12Z3	●	**25**	23.0	12.5	**M12**	56	35	5	10	19	3	1

Inserts are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Head (Applicable Insert WDMT08 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
MSX 08025M12Z2	●	**25**	23.0	12.5	**M12**	56	35	5	10	19	2	1
08028M12Z2	●	**28**	23.0	12.5	**M12**	56	35	5	10	19	2	1
MSX 08030M16Z3	●	**30**	28.5	17.0	**M16**	63	40	5	10	24	3	1
08032M16Z3	●	**32**	28.5	17.0	**M16**	63	40	5	10	24	3	1
08035M16Z3	●	**35**	28.5	17.0	**M16**	63	40	5	10	24	3	1

Inserts are sold separately.

Head (Applicable Insert WDMT12 type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
MSX 12032M16Z2	●	**32**	28.5	17.0	**M16**	63	40	5	10	24	2	1
12035M16Z2	●	**35**	28.5	17.0	**M16**	63	40	5	10	24	2	1
12040M16Z3	●	**40**	28.5	17.0	**M16**	63	40	5	10	24	3	1

Inserts are sold separately.

Arbors H255

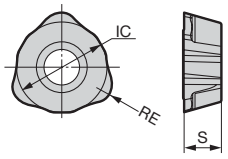
Insert

Dimensions (mm)

Grade Classification		Coated Carbide			
Process	High-speed/Light Cutting			K H	
	General-purpose	P M	P M	K H	
	Roughing	P M	P M		K H

Applications	Cat. No.	ACP200	ACP300	ACK200	ACK300	Inscribed Circle IC	Thickness S	Corner Radius RE	Applicable Cutter	Fig
General-purpose	**WDMT 0603ZDTR**	●	●	●	●	6.35	3.0	1.5	MSX06000M type	1
	0804ZDTR	●	●	●	●	8.5	4.0	2.0	MSX08000M type	1
	1205ZDTR	●	●	●	●	12.00	5.0	2.0	MSX12000M type	1
Honed type	**WDMT 0603ZDTR-H**	●	●	●	●	6.35	3.0	1.5	MSX06000M type	1
	0804ZDTR-H	●	●	●	●	8.5	4.0	2.0	MSX08000M type	1
	1205ZDTR-H	●	●	●	●	12.00	5.0	2.0	MSX12000M type	1

Fig 1



Recommended Cutting Conditions H181

Identification Code

MSX **06** **016** **M08** **Z2**

Series Code	Insert Size	Max. Dia.	Mounting Screw Size	Number of Teeth

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Clamp Plate	C-Ring	Clamp Screw	Anti-seizure Cream
MSX06000M type	BFTX02505IP	1.5	TRDR08IP	—	—	—	SUMI-P
MSX08000M type	BFTX0306IP	2.0		CCH3.5	CR03	BFTX03510IP08	
MSX12000M type	BFTX0409IP	3.0	TRDR15IP	CCH3.5	CR03	BFTX03510IP15	

N·m Recommended Tightening Torque (N·m)

RSX(F) 08000M/10000M/12000M type

SEC-Modular Tool

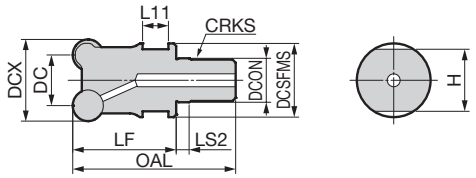
P Steel | M Stainless Steel | K Cast Iron | S Exotic Alloy

Rake Angle	Radial	-5° to -8°
	Axial	10°

4mm (08000M type) | 5mm (10000M type) | 6mm 4-cornered (12000M type) | 1.6mm 8-cornered (12000ES type)

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling

Fig 1



Head (Standard Pitch) Applicable Insert IC = 8mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
RSX 08020M10Z2	●	20	12	18.0	10.5	M10	49	30	5	8	15	2	0.1	1
08025M12Z3	●	25	17	23.0	12.5	M12	56	35	5	10	19	3	0.1	1
08032M16Z4	●	32	24	28.9	17.0	M16	63	40	5	10	24	4	0.2	1

Head (Extra Fine Pitch) Applicable Insert IC = 8mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
RSXF 08020M10Z3	●	20	12	18.0	10.5	M10	49	30	5	8	15	3	0.1	1
08025M12Z4	●	25	17	23.0	12.5	M12	56	35	5	10	19	4	0.1	1
08032M16Z5	●	32	24	28.9	17.0	M16	63	40	5	10	24	5	0.2	1

Head (Standard Pitch) Applicable Insert IC = 10mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
RSX 10025M12Z2	●	25	15	23.0	12.5	M12	56	35	5	10	19	2	0.1	1
10032M16Z3	●	32	22	28.5	17.0	M16	63	40	5	10	24	3	0.2	1

Head (Extra Fine Pitch) Applicable Insert IC = 10mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
RSXF 10025M12Z3	●	25	15	23.0	12.5	M12	56	35	5	10	19	3	0.1	1
10032M16Z4	●	32	22	28.5	17.0	M16	63	40	5	10	24	4	0.2	1

Head (Standard Pitch) Applicable Insert IC = 12mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
RSX 12032M16Z2	●	32	20	28.5	17.0	M16	63	40	5	10	24	2	0.2	1
12040M16Z3	●	40	28	28.5	17.0	M16	63	40	5	10	24	3	0.3	1

Head (Extra Fine Pitch) Applicable Insert IC = 12mm type

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
RSXF 12032M16Z3	●	32	20	28.5	17.0	M16	63	40	5	10	24	3	0.2	1
12040M16Z4	●	40	28	28.5	17.0	M16	63	40	5	10	24	4	0.3	1

Inserts are sold separately.

Arbors H255

Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting			MS	MS	
	General-purpose	PM		MS	MS	MS
	Roughing	PM	K			MS

Cat. No.	ACP200	ACK300	ACM100	ACM200	ACM300	Inscribed Circle IC	Corner Radius RE	Thickness S	Applicable Cutter	Fig
RDET 0803M0EN-G	●	●	●	●	●	8	4.0	3.18	RSX(F)08000ES/M type	1
0803M0EN-H	●	●	●	●	●	8	4.0	3.18		1
RDET 10T3M0EN-G	●	●	●	●	●	10	5.0	3.97	RSX(F)10000RS/ES/M type	1
10T3M0EN-H	●	●	●	●	●	10	5.0	3.97		1
RDET 1204M0EN-G	●	●	●	●	●	12	6.0	4.76	RSX(F)12000RS/ES/M type	2
1204M0EN-H	●	●	●	●	●	12	6.0	4.76		2

Fig 1 4-cornered

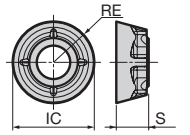
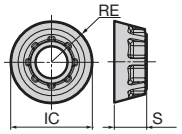


Fig 2 8-cornered



● Cross Section of Cutting Edge

Recommended Cutting Conditions H201 | Precautions for Mounting Inserts H196

Identification Code

RSX F 10 025 M12 Z2

RSX	F	10	025	M12	Z2
Series Code	Extra Fine Pitch	Insert Size	Max. Dia.	Mounting Screw Size	Number of Teeth

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
RSX(F)08000M	BFTX02506IP	1.5	TRDR08IP	SUMI-P
RSX(F)10000M type	BFTX03584IP	3.0	TRDR15IP	
RSX(F)12000M type	BFTX0409IP	3.0		

WRCX 08000M/10000M/12000M type

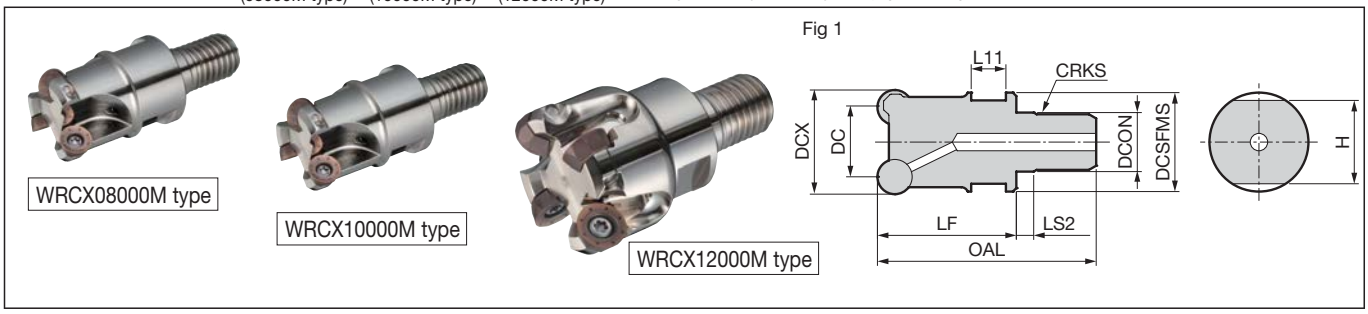
SEC-Modular Tool

P Steel | M Stainless Steel | K Cast Iron | N Aluminum Alloy

Rake Angle	Radial	-3° to 0°
	Axial	-3°

4mm (08000M type) | 5mm (10000M type) | 6mm (12000M type)

Face Milling | Shoulder Milling | Groove Milling | Ramping | Profiling | Helical Milling



Head (Applicable Insert IC = 8mm type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
WRCX 08020M10Z2	●	20	12	18.0	10.5	M10	49	30	5	8	15	2	1
08025M12Z3	●	25	17	23.0	12.5	M12	56	35	5	10	19	3	1

Inserts are sold separately.

Head (Applicable Insert IC = 10mm type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
WRCX 10025M12Z2	●	25	15	23.0	12.5	M12	56	35	5	10	19	2	1
10028M12Z2	●	28	18	23.0	12.5	M12	56	35	5	10	19	2	1
10030M16Z3	●	30	20	28.5	17.0	M16	63	40	5	10	24	3	1
10032M16Z3	●	32	22	28.5	17.0	M16	63	40	5	10	24	3	1

Inserts are sold separately.

Head (Applicable Insert IC = 12mm type)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Fig
WRCX 12040M16Z4	●	40	28	28.5	17.0	M16	63	40	5	10	24	4	1

Inserts are sold separately.

Arbors H255

Insert

Dimensions (mm)

Grade Classification		Coated Carbide					Cermented Carbide	DLC						
Process	High-speed/Light Cutting	P			K			N						
	General-purpose		PM	PM	K			N						
	Roughing		PM	PM		K								
Applications	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Inscribed Circle IC	Corner Radius RE	Thickness S	Applicable Cutter	Fig
General-purpose *1	QPMT 080330 PPEN		●	●	●	●	—	—	8	3.0	3.18	WRCX08000M type	1
	080330 PPEN-H		●	●	●	●	—	—					1
	QPMT 10T335 PPEN		●	●	●	●	—	—	10	3.5	3.97	WRCX10000M type	1
	10T335 PPEN-H		●	●	●	●	—	—					1
	QPMT 120440 PPEN		●	●	●	●	—	—	12	4.0	4.76	WRCX12000M type	1
	120440 PPEN-H		●	●	●	●	—	—					1
Non-Ferrous Metals	QPET 10T350 PPFR-S	—	—	—	—	—	●	●	10	5.0	3.97	WRCX10000M type	2
	QPET 120460 PPFR-S	—	—	—	—	—	●	●	12	6.0	4.76	WRCX12000M type	2
Surfing	QPMT 120460 PPER-R		●	●			—	—	12	6.0	4.76	WRCX12000M type	3

*1: -H at the end means the strong edged type.

Fig 1 8-cornered

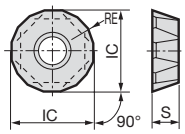


Fig 2 4-cornered

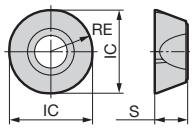
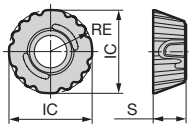


Fig 3 4-cornered

Surfing Insert



Recommended Cutting Conditions H206

Identification Code

WRCX 08 020 M10 Z2

Series Code	Insert Size	Max. Dia.	Mounting Screw Size	Number of Teeth

Parts

Applicable Cutter	Flat Insert Screw	N·m	Wrench	Anti-seizure Cream
WRCX08000M	BFTX02506IP	1.5	TRDR08IP	SUMI-P
WRCX10000M	BFTX03584IP	3.0	TRDR15IP	
WRCX12000M	BFTX0409IP	3.0	TRDR15IP	

N·m Recommended Tightening Torque (N·m)

WFXC 08000M/12000M type

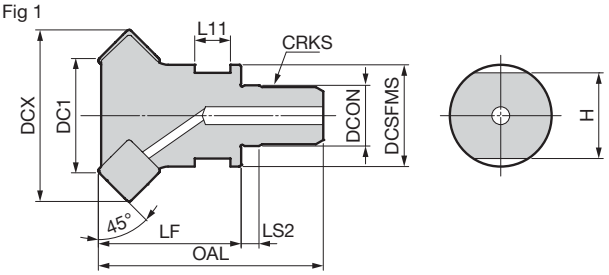
SEC-Modular Tool

P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy

Rake Angle	Radial	0°
	Axial	0°

45° Chamfering Back Chamfering

Fig 1



Head (Applicable Insert SOMT08 type)

Dimensions (mm)

Cat. No.	Stock	Min. Machining Dia. DC1	Max. Dia. DCX	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
WFXC 08016M08Z2	●	**16**	25.5	14.5	8.5	**M8**	42	25	5	8	13	2	0.1	1

DC1 and DCX dimensions are values with an insert with 0.8 corner radius mounted.

Head (Applicable Insert SOMT12 type)

Dimensions (mm)

Cat. No.	Stock	Min. Machining Dia. DC1	Max. Dia. DCX	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
WFXC 12025M12Z3	●	**25**	41.0	23.0	12.5	**M12**	56	32	5	10	19	3	0.1	1
12032M16Z3	●	**32**	48.0	28.5	17.0	**M16**	63	40	5	10	24	3	0.2	1

DC1 and DCX dimensions are values with an insert with 0.8 corner radius mounted.

Arbors H255

Insert

Dimensions (mm)

Grade Classification		Coated Carbide										Cemented Carbide	DLC	Cermet		
Process	High-speed/Light Cutting			P			K	K		M S		K N	N			
	General-purpose				P M	P M	K	K		M S	M S		N	P M		
	Roughing				P M	P M			K		M S			P		
Cat. No.		ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Corner Radius RE	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-L		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
SOMT 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOMT 080308PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		0.8	1
080312PZER-H		●	●	●	●	●	●	●	●	●	●	—	—		1.2	1
SOET 080304PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.4	1
080308PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	1
080312PZER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	1.2	1
SOET 080302PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.2	1
080304PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.4	1
080308PZFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	1
SOMT 120408PDER-L		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	2
SOMT 120404PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	0.4	2
120408PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	●	0.8	2
120412PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.2	2
120416PDER-G		●	●	●	●	●	●	●	●	●	●	—	—	—	1.6	2
SOMT 120408PDER-H		●	●	●	●	●	●	●	●	●	●	—	—	—	0.8	2
SOET 120408PDFR-S		—	—	—	—	—	—	—	—	—	—	●	●	—	0.8	2

Fig 1

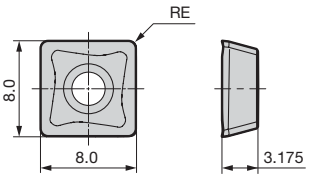
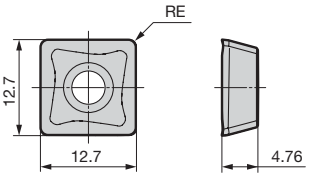


Fig 2



Recommended Cutting Conditions H220, 221 Precautions for Use H219

Identification Code

WFXC 08 016 M08 Z2

WFXC	08	016	M08	Z2
Series Code	Insert Size	Min. Machining Dia.	Mounting Screw Size	Number of Teeth

Parts

Applicable Cutter	Flat Insert Screw		Wrench	Anti-seizure Cream
WFXC08000M	BFTX0306IP	1.5	TRDR08IP	SUMI-P
WFXC12000M	BFTX03512IP	3.0	TRDR15IP	

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

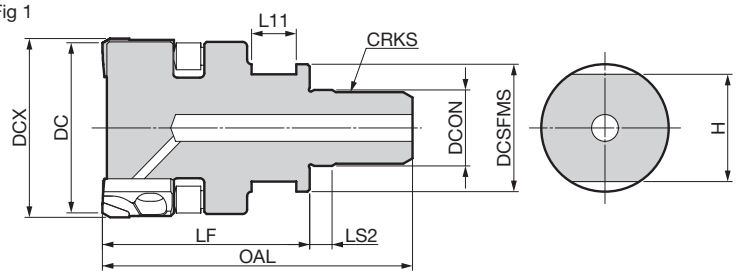
ANXS 16000M type

Rake Angle		
Rake	Radial	-2° to 0°
Angle	Axial	+5°

3mm 90°

Face Milling | Shoulder Milling | Groove Milling

Fig 1



Body (Steel)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Flat L11	Width H	Number of Teeth	Weight (kg)	Fig
Metric	**ANXS 16025M12Z02**	●	**25**	23	23.0	12.5	**M12**	61	40	5	10	19	2	0.1	1
	16030M16Z03	●	**30**	28	28.5	17.0	**M16**	70	47	5	10	24	3	0.2	1
	16030M16Z04	●	**30**	28	28.5	17.0	**M16**	70	47	5	10	24	4	0.2	1
	16032M16Z03	●	**32**	30	28.5	17.0	**M16**	70	47	5	10	24	3	0.3	1
	16032M16Z04	●	**32**	30	28.5	17.0	**M16**	70	47	5	10	24	4	0.3	1
	16040M16Z04	●	**40**	38	28.5	17.0	**M16**	70	47	5	10	24	4	0.4	1
	16040M16Z06	●	**40**	38	28.5	17.0	**M16**	70	47	5	10	24	6	0.4	1

Blades are sold separately.
If using blades with corner radius (ANB1604R/ANB1608R), DC = DCX.
Weight indicated includes the weight with blades and other spare parts.

Arbors H255

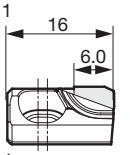
Blade Expansion

Dimensions (mm)

Grade Classification		SUMIDIA		SUMICRYSTAL V
Process	High-speed/Light Cutting	N	KN	N
	General-purpose	N	KN	
	Roughing	N	KN	

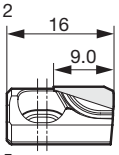
Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	Corner Radius RE	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●		—	6.0	—	Linear	Low Cutting Force	1
ANB 1600R-G	●		—	6.0	—	Arc-Shaped	General-purpose	1
ANB 1600R-GB		●	—	6.0	—	Arc-Shaped	Composite Milling*1	1
ANB 1600R-H	●	—	—	6.0	—	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●		—	9.0	—	Arc-Shaped	Long Edge	2
ANB 1604R	●		—	6.0	0.4	Linear	Corner Radius	3
ANB 1608R	●		—	6.0	0.8	Linear	Corner Radius	3
ANB 1600R-W	●		—	—	—	Arc-Shaped	Wiper	4
ANB 1600R-WS	—	—	●*2	—	—	Arc-Shaped	Wiper	5
ANBD	—	—	●*2	—	—	—	Dummy Blade	6

Fig 1



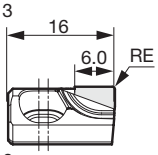
Wiper Blade

Fig 2



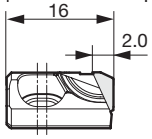
Wiper Blade

Fig 3



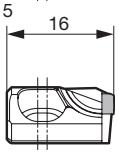
Dummy Blade

Fig 4



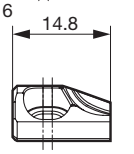
Wiper Blade

Fig 5



Wiper Blade

Fig 6



Dummy Blade

*1 Cast iron/aluminum alloy *2 Dummy blade for use with WS type (cemented carbide), refer to H228 "Precautions when Using Wiper Blades" (Mounting Precautions).

Recommended Cutting Conditions H233

Identification Code

ANX **S** **16** **032** **M16** **Z03**

ANX	S	16	032	M16	Z03
Series Code	Steel Body	Blade Size	Max. Dia.	Screw Size	Number of Teeth

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXS 16025M12Z02	10,000
16030M16Z03	10,000
16030M16Z04	10,000
16032M16Z03	10,000
16032M16Z04	10,000
16040M16Z04	10,000
16040M16Z06	10,000

*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

Parts

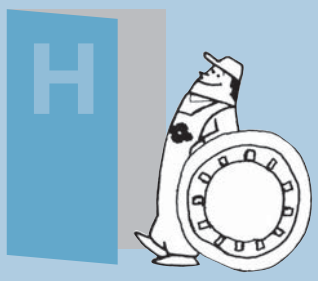
Cap Screw		Adjustment Screw	Wrench	Adjustment Wrench
	N·m			
BXA0310IP	**2.0**	HFJ	TRXW10IP	ANT

The adjustment wrench (ANT) can also be used for height adjustment of the High-speed Cutter RF type and High-efficiency Cutter HF type.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

Milling Cutters (Special Purpose)
H275 to H289

H



For High Feed Cast Iron Milling	SEC-Goal Mill series	H276
	GFX(C) 13000 type	H278
	GFX 16000 type	H279
	GRHNM 17000 type	H280
	GRHNF 17000 type	H281
For High Feed Cast Iron Milling	SEC-High-Feed Mill series	H282
	Cutting Edge Reference System	H283
	NRV 4000 / 5000 type	H284
	DPV 4000 / 5000 type	H285
	NFV 4000 / 5000 type	H286
For High-Feed Milling of Non-Ferrous Alloys/ Thin Workpieces	APV 5000 type	H287
QC System	IGETALLOY Quick Change System	H288
	Applicable Cutters for QC-System	H289

Stock Markings and Symbols

●● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

GFX series / GRHN type

■ Features

SEC-Goal Mill series cutters have been developed for high-efficiency machining and finishing of cast iron parts (such as engine cylinder blocks and transmission cases).

- Special cutters for high-feed milling of cast iron
- Multi-teeth design (approx. 3 teeth per inch)
- Finishing cutters feature an easy-to-use function for edge runout fine adjustment
- Highly reliable cutter with tangential inserts for finishing
- Chipbreaker type inserts for low cutting force

■ Product Range

Series Code	GFX	GRHN
Applications	Finishing	Roughing
Surface Roughness	< Ra3.2	< Ra12.5
Appearance		

Refer to the QC system on pages H288 to H289 for details and specifications on the two-piece mounting system and adapter.

Work Material	Applications	High-speed Finishing	Finishing to General Cutting	Interrupted Cutting	Applicable Cutter
K Cast Iron	Finishing	BN7000	ACK260	ACK280	GFX type

Work Material	Applications	Light Cutting	General Cutting	Heavy Interrupted Cutting	Applicable Cutter
K Cast Iron	For Roughing	ACK100	ACK200	ACK300	GRHN type

■ Grade Characteristics

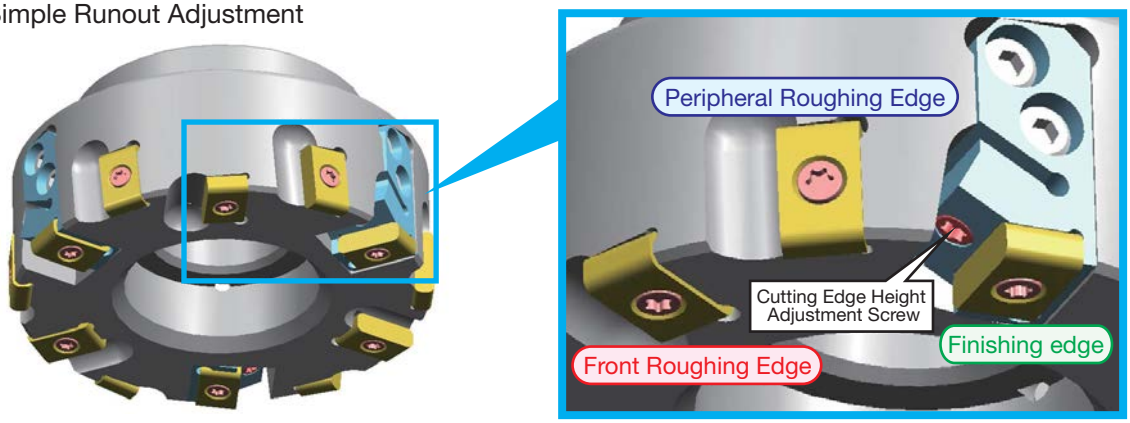
Work Material		Grade	Hardness	TRS (GPa)	Main Coating Components	Coating Thickness (μm)	Features
K Cast Iron	Coated Carbide	ACK100	92.0HRA	2.4	Super FF Coat	6	· Adopts a high-strength ultra-hard substrate and Super FF Coat, for a high-speed milling grade with excellent wear resistance.
		ACK200	91.7HRA	2.5	Super FF Coat	6	· A grade that employs a tough carbide substrate and thin Super FF Coat to provide superior thermal crack and wear resistance.
		ACK260	92.6HRA	2.6	Super ZX Coat	3	· From finishing to general Milling of cast iron and ductile cast iron. · Employs new super multi-layered PVD coating consisting of nanometre-thin layers of TiAlN and AlCrN. Combines with a tough, thermal-resistant substrate for long and stable tool life.
		ACK280	91.7HRA	3.0	Super ZX Coat	3	· For heavy interrupted cutting or wet cutting of cast iron and ductile cast iron. · Employs new super multi-layered PVD coating consisting of nanometre-thin layers of TiAlN and AlCrN. Coupled with an ultra-tough substrate for superior fracture resistance and thermal crack resistance during wet cutting.
		ACK300	91.4HRA	3.3	Super ZX Coat	3	· General-purpose to interrupted milling of cast iron and ductile cast iron. · Employs PVD coating consisting of multiple nanometre-thin layers. Provides excellent fracture resistance when combined with a fine-grained tough substrate.
	CBN	BN7000	41.0HV to 44.0HV	1.8 up to 1.9	—	—	· Grade exhibiting wear and fracture resistance in cutting of cast iron and exotic alloys.

BN7000 Characteristic Values ☞H15

ACK100, ACK200, ACK300 Characteristic Values ☞H15

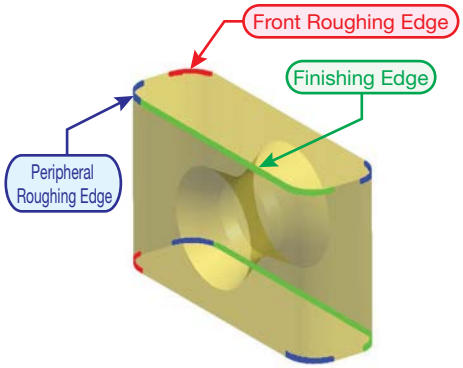
■ GFX type Features

● Simple Runout Adjustment

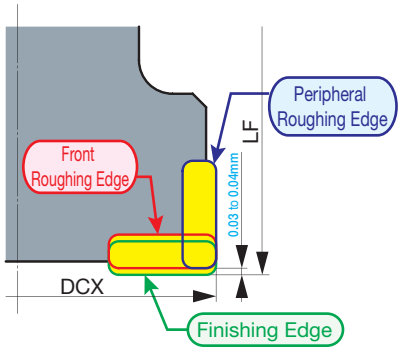


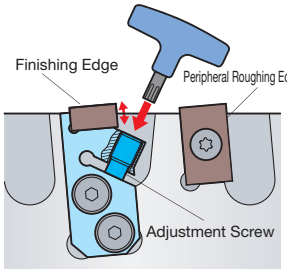
Finishing edge runout can be adjusted by 5 µm or less simply by turning the adjustment screw.

● Economical 8-Cornered Insert



Arraying the same number of vertical and horizontal inserts allows 8-corner configuration.

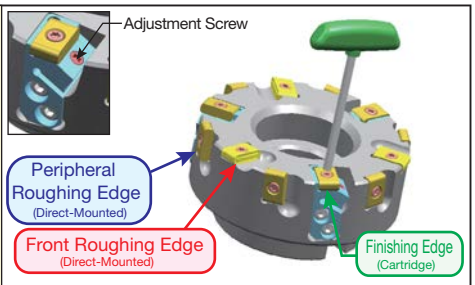




Finishing Edge Adjustment on GFX type

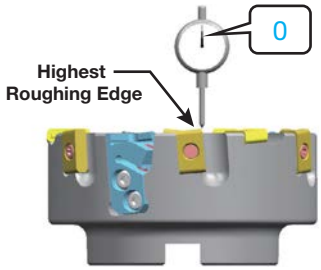
■ GFX type Finishing Edge Runout Adjustment Procedure

(1) Insert Assembly
Attach insert to cutter body. When doing so, check that the cartridge adjustment screw is completely loose.

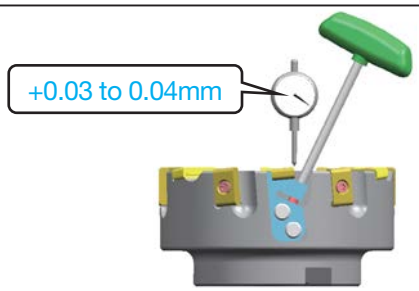


(2) Check Roughing Edge Runout
Measure face runout of the roughing edge and identify the cutting edge that protrudes the most.

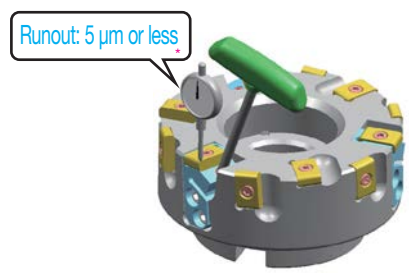
(3) Set Reference Roughing Edge
Set the cutting edge height of the insert identified in (2) as "0".



(4) Adjust Finishing Edge Height
Select a finishing edge and adjust with the adjustment screw so that the edge protrudes around 0.03 to 0.04mm further than (3).



(5) Adjust Runout
With the finishing edge from (4) as a reference, adjust the position of the other finishing edges so that runout is equal to or less than 5 µm.



- Always adjust finishing edge height before use. Adjust the height in the screw tightening directions.
- Using the tool with the adjustment screw loose may result in tool breakage.

* Adjusting finishing edge runout to 2 µm or less will result in a better machined surface.

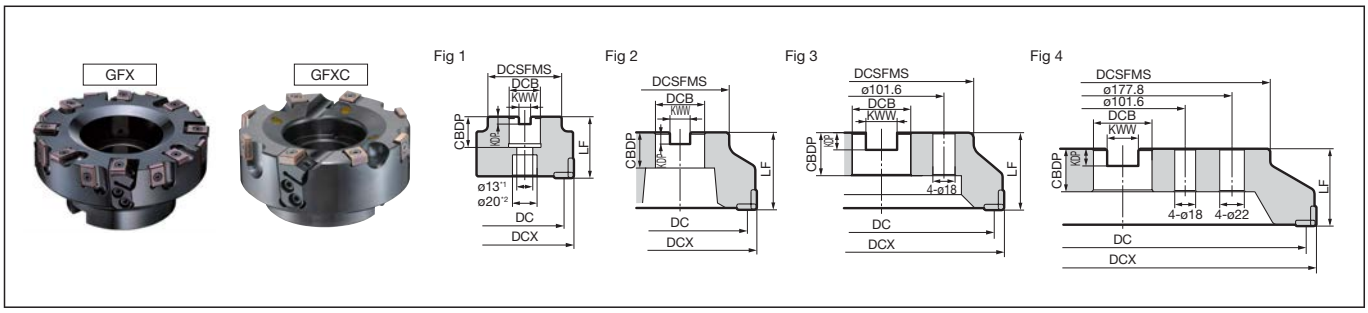
GFX 13000 / GFXC 13000 type

Cast Iron

Rake Angle		
Radial	-8°	
Axial	-5°	

1 mm | 89°~89°30'

Face Milling



Body (Standard Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Total No. of Teeth	Number Of Finishing Teeth	Effective No. of Teeth	Weight (kg)	Fig
Inch	**GFX 13080R/L**	●		**80**	67.3	60	50	**25.4**	9.5	6	25	8	2	8	1.4	1
	13100R/L	●		**100**	87.3	70	50	**31.75**	12.7	8	32	12	3	12	1.9	2
	13125R/L	●		**125**	112.3	80	63	**38.1**	15.9	10	38	16	4	16	3.3	2
	13160R/L	●		**160**	147.3	120	63	**50.8**	19.1	11	38	20	5	20	6.4	2
	13200R/L			**200**	187.3	150	63	**47.625**	25.4	14	35	28	7	28	7.8	3
	13250R/L			**250**	237.3	200	63	**47.625**	25.4	14	35	36	9	36	12.6	3
	13315R/L			**315**	302.3	240	80	**47.625**	25.4	14	35	44	11	44	20.2	4

Body (Coarse Pitch)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Total No. of Teeth	Number Of Finishing Teeth	Effective No. of Teeth	Weight (kg)	Fig
Metric	**GFXC13063RS/LS**	●		**63**	50.3	50	50	**22**	10.4	6.3	20	4	1	4	0.9	1
Inch	**GFXC13080R/L**	●		**80**	67.3	60	50	**25.4**	9.5	6	25	6	1	6	1.4	1
	13100R/L	●		**100**	87.3	70	50	**31.75**	12.7	8	32	8	2	8	1.9	2
	13125R/L	●		**125**	112.3	80	63	**38.1**	15.9	10	38	10	2	10	3.3	2
	13160R/L	●		**160**	147.3	120	63	**50.8**	19.1	11	38	12	3	12	5.9	2
	13200R/L	●		**200**	187.3	150	63	**47.625**	25.4	14	35	16	4	16	7.8	3
	13250R/L	●		**250**	237.3	184	63	**47.625**	25.4	14	35	20	5	20	9.4	3
	13315R/L	●		**315**	302.3	240	80	**47.625**	25.4	14	35	24	6	24	17.9	4

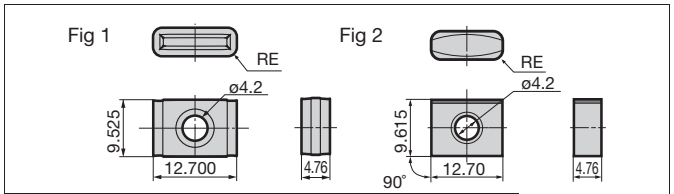
*1: GFXC13063RS/LS is ø11. (Fig 1) *2: GFXC13063RS/LS is ø18. (Fig 1) Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)



Grade Classification		Coated Carbide			Carbide	CBN			
Process	High-speed Finishing					K			
	Finishing/Medium Cutting	K							
	Roughing		K	K					
Cat. No.		ACK260	ACK280	ACK300	H10E	BN7125	BN7000	Corner Radius RE	Fig
LNGX 130508PNFN-W		●	●		●	—	—	0.8	1
130516PNFN-W		●	●		●	—	—	1.6	1
130516PNTN-W		—	—	—	—	○	●	1.6	2

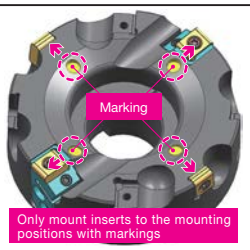
Parts H279

● Allowable Spindle Speed for CBN Inserts by Size

H279

Precautions for Use of GFXC type

GFXC type can be used with fewer teeth attached. In this case, only mount inserts to the mounting positions with markings. Remove the screws from the mounting positions where inserts will not be mounted.



GFXC type with total no. of teeth and when mounting reduced no. of teeth.

Cat. No.	Dia. DC	Total No. of Teeth	Reduced No. of Teeth
GFXC 13063RS/LS	63mm	4	2
13080R/L	80mm	6	2
13100R/L	100mm	8	4
13125R/L	125mm	10	4

Cat. No.	Dia. DC	Total No. of Teeth	Reduced No. of Teeth
GFXC 13160R/L	160mm	12	6
13200R/L	200mm	16	8
13250R/L	250mm	20	10
13315R/L	315mm	24	12

The number of inserts mounted should always match either the "Total No. of Teeth" or "Reduced No. of Teeth" quantities.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Cast Iron	250HB	200- **250**- 350	0.1-**0.3**-0.5	ACK260
K	Cast Iron	250HB	800-**1,000**-1,200	0.1-**0.3**-0.5	BN7125

Note Calculate cutting conditions based on effective no. of teeth.
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

○ mark: Stock or planned stock (please confirm stock availability)

GFX 16000 type

K Cast Iron

Rake Angle		
Radial		-8°
Axial		-5°

1 mm, 89°~89°30'

Face Milling

Fig 1

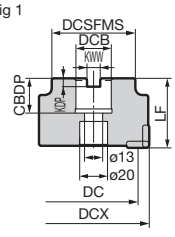


Fig 2

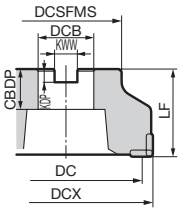


Fig 3

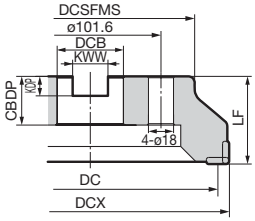
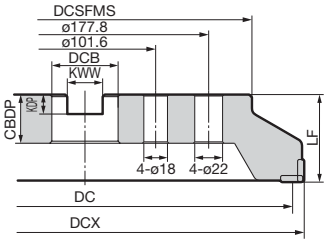


Fig 4



Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Total No. of Teeth	Number Of Finishing Teeth	Effective No. of Teeth	Weight (kg)	Fig
Inch	**GFX 16080R/L**			**80**	64.1	60	50	**25.4**	9.5	6	25	8	2	8	1.4	1
	16100R/L	●		**100**	84.125	70	50	**31.75**	12.7	8	32	12	3	12	1.9	2
	16125R/L	●		**125**	109.125	80	63	**38.1**	15.9	10	38	16	4	16	3.3	2
	16160R/L	●		**160**	144.125	120	63	**50.8**	19.1	11	38	20	5	20	6.4	2
	16200R/L	●		**200**	184.125	150	63	**47.625**	25.4	14	35	28	7	28	7.8	3
	16250R/L			**250**	234.1	130	63	**47.625**	25.4	14	35	36	9	36	12.6	3
	16315R/L			**315**	299.125	240	80	**47.625**	25.4	14	35	44	11	44	20.8	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide			Carbide	CBN		
Process	High-speed Finishing					K		
	Finishing/Medium Cutting	K						
	Roughing		K	K				
Cat. No.		ACK260	ACK280	ACK300	H10E	BN7125	BN7000	Fig
LNGX 160516PNFN-W		●	●		●	—	—	1
160516PNTN-W		—	—	—	—			2

Fig 1

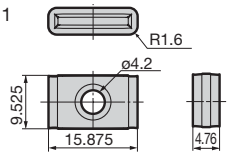
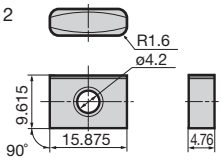


Fig 2



Parts

Cartridges (For 13000)	Cartridges (For 16000)	Wrench (For Cartridges)	Adjustment Screw	Wrench (For Adjustment Screw)	Flat Insert Screw		Wrench	Cap Screw/Radial Cartridge (For GFXK4R/L)	Cap Screw/Radial Cartridge (For GFVK5R/L)	Anti-seizure Cream
						N·m				
GFXK4R/L	GFVK5R/L	TH030	BTD05F09	LT15	BFTX03588	3.0	TTX15W	BX0414	BX0418	SUMI-P

Finishing cartridges do not come assembled with inserts.

● Allowable Spindle Speed for CBN Inserts by Size

Max. Dia. (mm) DCX	Allowable Spindle Speed (min⁻¹) n max.	Max. Dia. (mm) DCX	Allowable Spindle Speed (min⁻¹) n max.
ø63	6,000	ø160	2,300
ø80	4,700	ø200	1,900
ø100	3,800	ø250	1,500
ø125	3,000	ø315	1,200

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Cast Iron	250HB	200- **250**- 350	0.1-**0.3**-0.5	ACK260
K	Cast Iron	250HB	800-**1,000**-1,200	0.1-**0.3**-0.5	BN7125

Note Calculate cutting conditions based on effective no. of teeth.
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

GRHNM 17000 type

K Cast Iron

Rake Angle	Radial	-6°30' to -5°
	Axial	-6°

6mm 60°

Face Milling

Fig 1

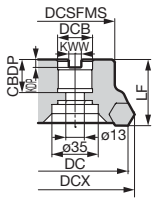


Fig 2

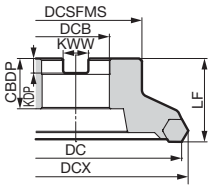


Fig 3

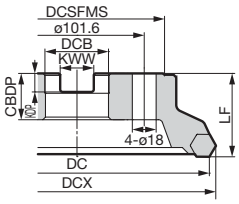
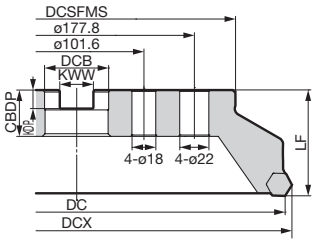


Fig 4



Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Total No. of Teeth	Weight (kg)	Fig
Inch	**GRHNM 17080R/L**	●		**80**	90.5	60	50	**25.4**	9.5	6	25	8	1.2	1
	17100R/L	●		**100**	110.5	70	50	**31.75**	12.7	8	32	10	1.7	2
	17125R/L	●		**125**	135.5	80	63	**38.1**	15.9	10	38	12	2.9	2
	17160R/L	●		**160**	170.5	100	63	**50.8**	19.1	11	38	16	4.5	2
	17200R/L	●		**200**	210.5	130	63	**47.625**	25.4	14	35	20	7.3	3
	17250R/L	●		**250**	260.5	130	63	**47.625**	25.4	14	35	24	13.1	3
	17315R/L	●		**315**	325.5	240	80	**47.625**	25.4	14	40	28	24.5	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

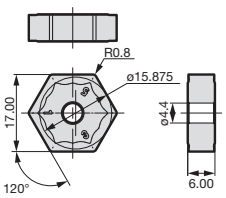
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide			
Process	High-speed/Light Cutting	K	K		
	General-purpose	K	K		
	Roughing			K	
Cat. No.		ACK100	ACK200	ACK300	Fig
HNEF 100608DNEN-G		●	●	●	1

Fig 1



Parts

Double Screw		Clamp Plate	Wrench	Anti-seizure Cream
WB6-20T	**6.0**	GRHNW	TTX20	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Cast Iron	250HB	200-**250**-300	0.15-**0.23**-0.30	ACK200

Note Calculate cutting conditions based on effective no. of teeth.
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

GRHNF 17000 type

Rake Angle		
Radial	-6°30' to -5°	
Axial	-6°	

6mm 60°

Face Milling

Fig 1

Fig 2

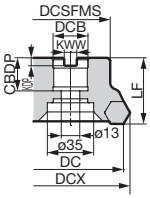


Fig 3

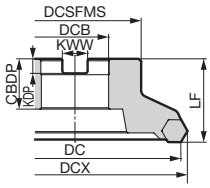
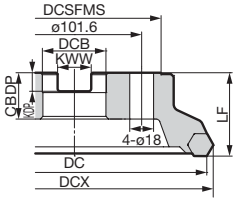
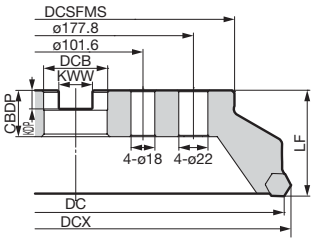


Fig 4





Body

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Total No. of Teeth	Weight (kg)	Fig
Inch	**GRHNF 17080R/L**	●		**80**	90.5	60	50	**25.4**	9.5	6	25	10	1.2	1
	17100R/L	●		**100**	110.5	70	50	**31.75**	12.7	8	32	14	1.8	2
	17125R/L	●		**125**	135.5	80	63	**38.1**	15.9	10	38	18	2.9	2
	17160R/L	●		**160**	170.5	100	63	**50.8**	19.1	11	38	22	4.5	2
	17200R/L	●		**200**	210.5	130	63	**47.625**	25.4	14	35	28	7.3	3
	17250R/L	●		**250**	260.5	130	63	**47.625**	25.4	14	35	36	13.1	3
	17315R/L	●		**315**	325.5	240	80	**47.625**	25.4	14	40	44	24.5	4

Inserts are sold separately.

Note For mounting the cutters marked with * to an arbor, use a JIS B1176 hex socket bolt (M12 x 30 to 35mm).

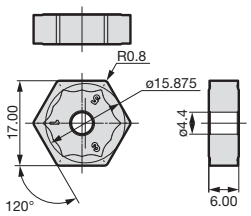
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide			
Process	High-speed/Light Cutting	K	K		
	General-purpose	K	K		
	Roughing			K	
Cat. No.		ACK100	ACK200	ACK300	Fig
HNEF 100608DNEN-G		●	●	●	1

Fig 1



Parts

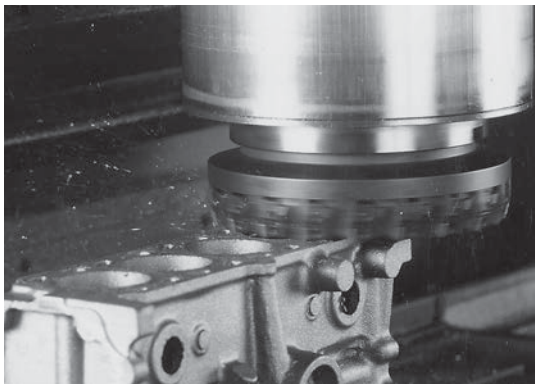
Double Screw		Clamp Plate	Wrench	Anti-seizure Cream
WB6-20T	**6.0**	GRHNW	TTX20	SUMI-P

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Cast Iron	250HB	200-**250**-300	0.15-**0.23**-0.30	ACK200

Note Calculate cutting conditions based on effective no. of teeth.
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

High-Feed Face Mills



■ Features

Sumitomo Electric Hardmetal SEC-High-Feed Face Mills achieve high-performance milling particularly suited for cast irons, aluminum and light alloys. Cutting edge reference system design is rugged, simple and easy to maintain.
A range of face mills are available to suit various applications.

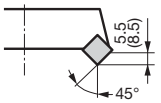
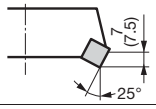
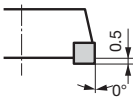
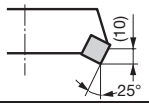
■ Series Common Features

- Dedicated cutter for high-feed Milling of cast iron and light alloys.
- Cutting edge reference system provides simple, easy and fast runout management. (→H283)
- Fine-pitched cutter design (3 teeth per inch) is ideal for high-efficiency machining.
  Cutting edge to O.D. inch conversion (example: ø100 ≈ 4 inches x 3 = 12 teeth)
- An excellent range of cutter designs and insert grades to suit various applications.
- Quick change system enables fast replacement of cutter. (→H288)

	Cat. No.	Specifications	Applicable Cutter Size
(1)	F type / NF type*	Quick Change System	ø160mm and below
(2)	2-piece type	2-piece system	ø200mm and above
(3)		Two-piece cutter with centre bolt	

* The Quick Change System NF type is a made-to-order item. For details, please contact us directly.

■ Type / Specifications

Applications		Cat. No.	Approach Angle & Maximum Depth of Cut ( ) for 5000 type	Rake Angle		Insert Cat. No.	Page
Applications	Surface Roughness			Axial Rake	Radial Rake		
Roughing	25S	**NRV 4000 type**		-5°	-6°	SNC43MW	**H238**
		NRV 5000 type				SNC535	
Roughing / Finishing	18S	**DPV 4000 type**		+10°	+5°	SDCN42R/L	**H239**
		DPV 5000 type				SDCN53R/L	
Finishing	12.5S	**NFV 4000 type**		-5°	-6°	6SS43M	**H240**
		NFV 5000 type				6SS53M	
Roughing/ Finishing of Light Alloy	12.5S	**APV 5000 type**		+18°	-2°	SDC53R/L	**H241**

■ Recommended Cutting Conditions

Cat. No.	Insert Cat. No.	Insert Grades	Cutting Conditions (Min. - **Optimum** - Max.)		
			vc(m /min)	fz(mm/t)	ap(mm)
NRV 4000 type	SNC43MW	ACK200	80 - **100** - 120	0.1 - **0.15** - 0.2	up to 3
NRV 5000 type	SNC535	ACK200	80 - **100** - 120	0.1 - **0.15** - 0.2	up to 3
DPV 4000 type	SDCN42R/L	G10E	80 - **100** - 120	0.1 - **0.15** - 0.2	up to 3
DPV 5000 type	SDCN53R/L	G10E	80 - **100** - 120	0.1 - **0.15** - 0.2	up to 5
NFV 4000 type	6SS43M	H10E	120 - **160** - 200	0.1 - **0.15** - 0.2	up to 0.5
NFV 5000 type	6SS53M	H10E	120 - **160** - 200	0.1 - **0.15** - 0.2	up to 0.5
APV 5000 type	SDC53R/L	H1	< 400	0.1 - **0.20** - 0.3	up to 3

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Cutting Edge Reference System

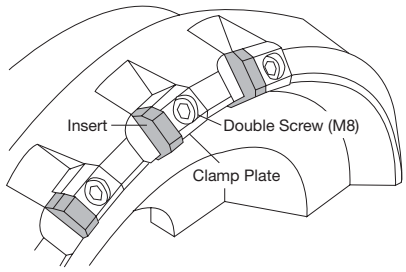
■ Features

Conventional indexable cutters are designed to position and clamp two or three faces of the insert with locators, etc. The cutting edge reference cutter, on the other hand, retains the insert only with a clamp plate. (See Fig 1) This system is adopted for our entire high-feed cutter series.

■ Features of the Cutting Edge Reference Cutter

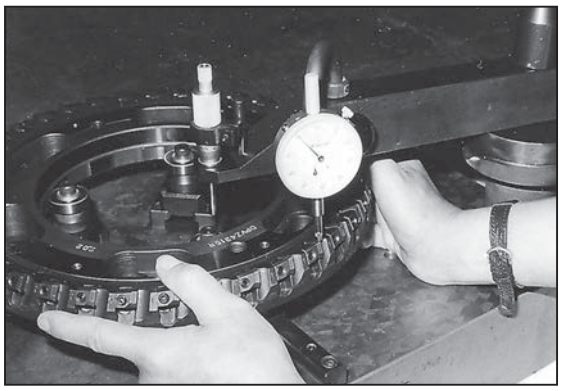
- Axial runout of the inserts is kept within 5 to 10μm to ensure stable surface roughness and longer tool life.
- Simple design with fewer parts compared to the locator type facilitates cleaning the typical cast iron machining dirt and is comparatively inexpensive.
- Fewer parts allow high-density cutter design, higher machining efficiency and longer tool life.

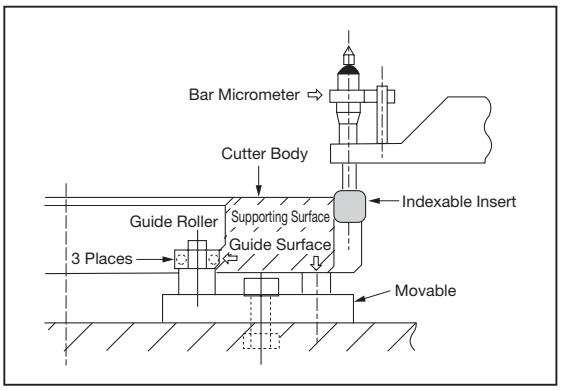
Fig 1



■ Assembly Jig

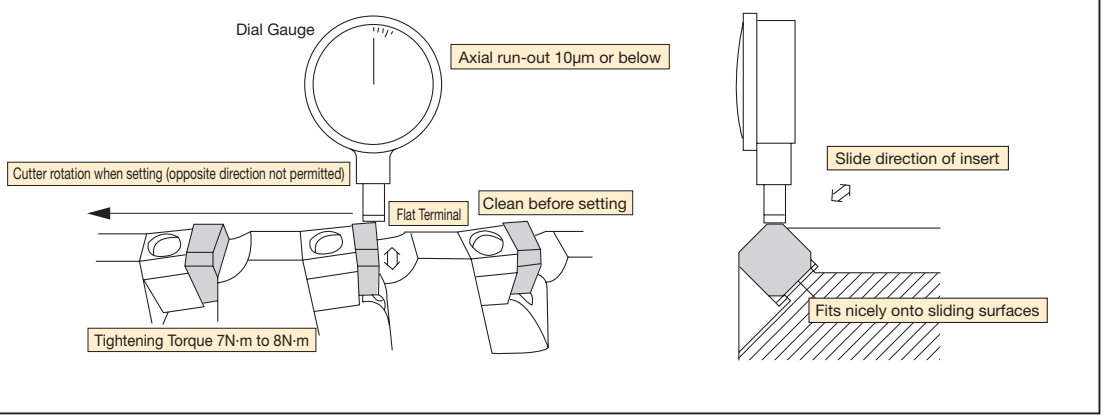
Application of a special assembly jig (as shown in the figure below) is recommended to accurately assemble the cutting edge reference cutter.





■ Insert Assembly Guidelines

When mounting (assembling) the inserts, pay careful attention to the points noted below in .



NRV 4000/5000 type

K Cast Iron

Rake Angle	Radial	-6°
	Axial	-5°

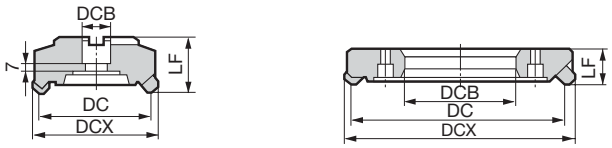
5.5mm 45° (4000 type)

8.5mm 45° (5000 type)

Face Milling

Fig 1

Fig 2



Body

Dimensions (mm)

Classification		Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX*	Height LF	Hole Dia. DCB	Number of Teeth	Weight (kg)	Fig
Inch	F type	**NRV○100QR/L**			**100**	112(118)	60	**31.75**	10	2.7	1
		○125QR/L			**125**	137(143)	60	**38.1**	14	3.8	1
		○160QR/L			**160**	172(177)	60	**50.8**	18	6.3	1
	2-piece type	**NRVZ○200R/L**			**200**	212(218)	40	**80**	24	5.8	2
		○250R/L			**250**	262(268)	40	**120**	30	9.0	2
		NRVZ○315R/L			**315**	326(332)	40	**180**	36	12.5	2
		○355R/L			**355**	366(372)	40	**220**	42	15.5	2
		NRVZ○400R/L			**400**	411(417)	40	**250**	48	18.8	2
		○450R/L			**450**	461(467)	40	**300**	54	22.0	2

Inserts are sold separately.
Put 4 or 5 in "○" in the catalogue number.
Refer to page H288 for special arbors for the type of cutters shown in Fig 1.
Refer to page H288 for dedicated adapters for the type of cutters shown in Fig 2.
* marked dimensions in ( ) are for the 5000 type.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide		Cemented Carbide
Process	High-speed/Light Cutting	K		
	General-purpose	K		K
	Roughing		K	

Cat. No.	ACK200	ACK300	G10E	Inscribed Circle IC	Chamfering CHW	Corner Radius RE	Fig	Applicable Cutter
SNC 43MW			●	12.70	3.0	—	1	NRV4000
SNC 433				12.70	—	1.2	2	NRV4000
434				12.70	—	1.6	2	NRV4000
435				12.70	—	2.0	2	NRV4000
436				12.70	—	2.4	2	NRV4000
SNC 535				15.875	—	2.0	3	NRV5000
SNMN 432			●	12.70	—	0.8	3	NRV4000
433		●	●	12.70	—	1.2	3	NRV4000
434				12.70	—	1.6	3	NRV4000
435				12.70	—	2.0	3	NRV4000
436				12.70	—	2.4	3	NRV4000

Fig 1

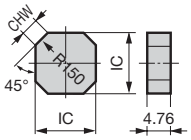


Fig 2

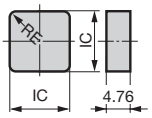
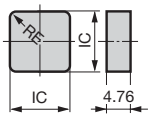


Fig 3



Recommended Cutting Conditions H282

Parts

Applicable Cutters	Clamp Plate ø160 and below	Clamp Plate ø200 and above	Double Screw	Wrench	Anti-seizure Cream	Jig
NRV(Z) 4000R type	NW41RR	NW42RR	WB6-20	TH030	SUMI-P	· Arbor for F type · Adapter for 2-piece type
NRV(Z) 4000L type	NW41RL	NW42RL				
NRV(Z) 5000R type	NW51R	NW52R	WV6-20			
NRV(Z) 5000L type	NW51L	NW52L				

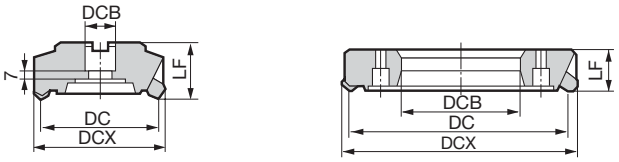
DPV 4000/5000 type

Rake Angle		
Rake	Radial	5°
Angle	Axial	10°

7mm 65° (4000 type) 7.5mm 65° (5000 type) Face Milling

Fig 1

Fig 2



Body

Dimensions (mm)

Classification		Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX*	Height LF	Hole Dia. DCB	Number of Teeth 4000	Number of Teeth 5000	Weight (kg)	Fig
Inch	F type	**DPV○100QR/L**			**100**	107.2(109.6)	60	**31.75**	12	10	2.6	1
		○125QR/L			**125**	131.5(133.6)	60	**38.1**	16	14	3.6	1
		○160QR/L			**160**	165.8(176.6)	60	**50.8**	20	18	6.0	1
	2-piece type	**DPVZ○200R/L**			**200**	206.5(208)	40	**80**	26	24	5.5	2
		○250R/L			**250**	256 (258)	40	**120**	32	32	9.0	2
		○315R/L			**315**	322.5(323)	40	**180**	38	36	12.0	2
		○355R/L			**355**	361.5(363)	40	**220**	44	42	15.0	2
		○400R/L			**400**	406.5(408)	40	**250**	50	48	17.8	2
		○450R/L			**450**	456.5(458)	40	**300**	56	54	20.8	2

Inserts are sold separately.
Put 4 or 5 in "○" in the catalogue number.
Refer to page H288 for special arbors for the type of cutters shown in Fig 1.
Refer to page H288 for dedicated adapters for the type of cutters shown in Fig 2.
* marked dimensions in ( ) are for the 5000 type.

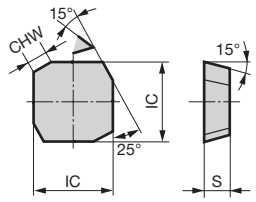
Insert

Dimensions (mm)

Grade Classification		Coated Carbide		Cemented Carbide
Process	High-speed/Light Cutting	K		K
	General-purpose	K		
	Roughing		K	

Cat. No.	ACK200	ACK300	H10E	Inscribed Circle IC	Thickness S	Chamfering CHW	Applicable Cutter	Fig
SDCN 42R			●	12.70	3.18	3.5	DPV4000R	1
42L			●	12.70	3.18	3.5	DPV4000L	1
SDCN 53R			●	15.875	5.0	5.0	DPV5000R	1
53L				15.875	5.0	5.0	DPV5000L	1

Fig 1



Recommended Cutting Conditions H282

Parts

Applicable Cutters	Clamp Plate ø160 and below	Clamp Plate ø200 and above	Double Screw	Wrench	Anti-seizure Cream	Jig
DPV(Z) 4000R type	HTW40R	HTW41R	WB6-20	TH030	SUMI-P	· Arbor for F type · Adapter for 2-piece type
DPV(Z) 4000L type	HTW40L	HTW41L				
DPV(Z) 5000R type	HTW50R	HTW51R	WB6-20			
DPV(Z) 5000L type	HTW50L	HTW51L				

NFV 4000/5000 type

K Cast Iron

Rake	Radial	-6°
Angle	Axial	-5°

0.5mm 90°

Face Milling

Fig 1

Fig 2

Body

Dimensions (mm)

Classification		Cat. No.	Stock R	Stock L	Dia. DC	Height LF	Hole Dia. DCB	Number of Teeth	Weight (kg)	Fig
Inch	F type	**NFV○100QR/L**			**100**	60	**31.75**	10	2.6	1
		○125QR/L			**125**	60	**38.1**	14	3.9	1
		○160QR/L			**160**	60	**50.8**	18	6.3	1
	2-piece type	**NFVZ○200R/L**			**200**	40	**80**	24	5.3	2
		○250R/L			**250**	40	**120**	30	9.0	2
		○315R/L			**315**	40	**180**	36	11.3	2
		○355R/L			**355**	40	**220**	42	14.0	2
		○400R/L			**400**	40	**250**	48	16.5	2
		○450R/L			**450**	40	**300**	54	21.0	2

Inserts are sold separately.
Put 4 or 5 in "○" in the catalogue number.
Refer to page H288 for special arbors for the type of cutters shown in Fig 1.
Refer to page H288 for dedicated adapters for the type of cutters shown in Fig 2.

Insert

Dimensions (mm)

Grade Classification		Carbide
Process	High-speed/Light Cutting	K
	General-purpose	
	Roughing	

Cat. No.	H10E	Inscribed Circle IC	Thickness S	Applicable Cutter	Fig
SNEF 43W	●	12.70	4.76	NFV4000	1
6SS 43M	●	12.70	4.76	NFV4000	2
SNEF 53W	●	15.875	4.76	NFV5000	1
53WT		15.875	4.76	NFV5000	1
6SS 53M	●	15.875	4.76	NFV5000	2
SNEN 535W		15.875	4.76	NFV5000	3

Fig 1

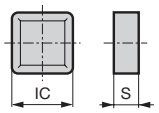


Fig 2

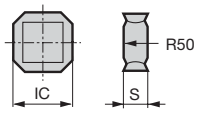
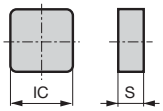


Fig 3



Recommended Cutting Conditions ☞ H282

Parts

Application Milling Cutters	Clamp Plate ø160 and below	Clamp Plate ø200 and above	Double Screw	Wrench	Anti-seizure Cream	Jig
NFV(Z) 4000R type	NW41FR	NW42FR	WB6-20	TH030	SUMI-P	· Arbor for F type · Adapter for 2-piece type
NFV(Z) 4000L type	NW41FL	NW42FL				
NFV(Z) 5000R type	NW51R	NW52R				
NFV(Z) 5000L type	NW51L	NW52L				

APV 5000 type

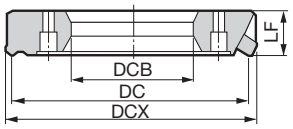
P Steel K Cast Iron N Non-Ferrous Metal

Rake Angle	Radial	-2°
	Axial	18°

10mm / 65°

Face Milling

Fig 1



Body

Dimensions (mm)

Classification		Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Height LF	Hole Dia. DCB	Number of Teeth	Weight (kg)	Fig
Inch	2-piece type	**APVZ 5200R/L**			**200**	211	40	**80**	18	7.0	1
		5250R/L			**250**	261	40	**120**	22	10.8	1
		5315R/L			**315**	326	40	**180**	26	13.7	1
		5355R/L			**355**	366	40	**220**	32	16.3	1
		5400R/L			**400**	411	40	**250**	36	20.0	1
		5450R/L			**450**	461	40	**300**	40	23.6	1

Inserts are sold separately.

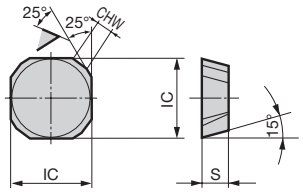
Insert

Dimensions (mm)

Grade Classification		Cemented Carbide		Cermet
Process	High-speed/Light Cutting		K N	
	General-purpose	P		P
	Roughing			

Cat. No.	A30N	H1	T250A	Inscribed Circle IC	Thickness S	Chamfering CHW	Applicable Cutter	Fig
SDC 53R		●		15.88	4.76	2.5	APV5000R	1
53L		●		15.88	4.76	2.5	APV5000L	1
53TR	●			15.88	4.76	2.5	APV5000R	1
53TL				15.88	4.76	2.5	APV5000L	1
53TR-R				15.88	4.76	2.5	APV5000R	1
SDCH 53TR	●			15.88	4.76	2.5	APV5000R	1
53TR-R				15.88	4.76	2.5	APV5000R	1

Fig 1



Recommended Cutting Conditions H282

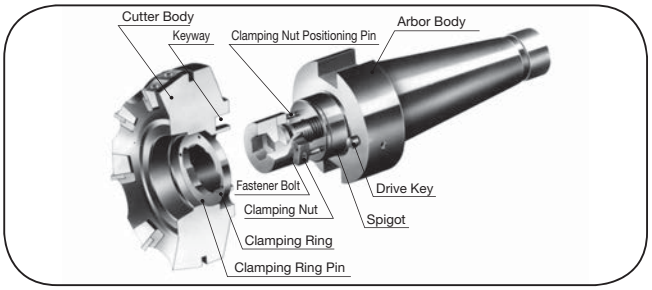
Parts

Applicable Cutter	Clamp Plate ø200 and above	Double Screw	Wrench	Anti-seizure Cream	Jig
APVZ55000R type	AW52R	WB6-20	TH030	SUMI-P	· Adapter for 2-piece type
APVZ55000L type	AW52L				

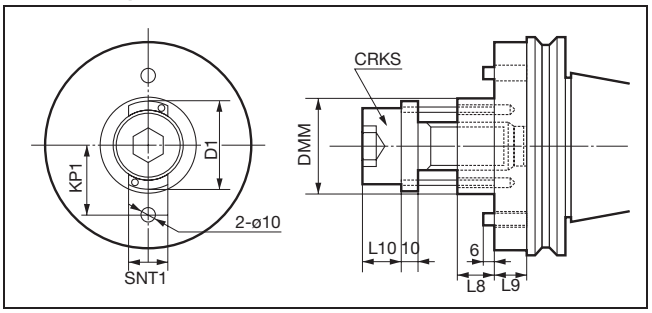
QC System

■ Quick-F series

● Structure



● Arbor Specifications



Dimensions (mm)

Cat. No.	Shank DMM	Bolt D1	Screw CRKS	Keyway Width SNT1	Length L8	Length L9	Length L10	Key position KP1
○○○○QF4R/L	31.75	30.75	M14 P2.0	18	22	22	13	27.5
○○○○QF5R/L	38.1	37.1	M16 P2.0	20	20	24	14	27.5
○○○○QF6R/L	50.8	49.8	M20 P2.5	24	20	30	16	34

Enter the taper code in the ○ mark. (Example: BT50-QF4R)

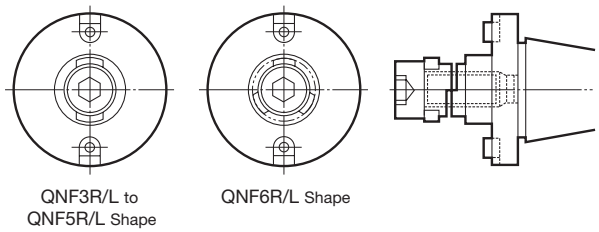
● Features and Applications

(1) Requires less time for mounting and removing.
(2) Can be used with cutter diameters of 4" (ø100) to 6" (ø160).

■ Quick-NF series (Applicable to cutter diameters of 3" (ø80) to 6" (ø160))

* Made-to-order item. Please contact us directly when ordering.

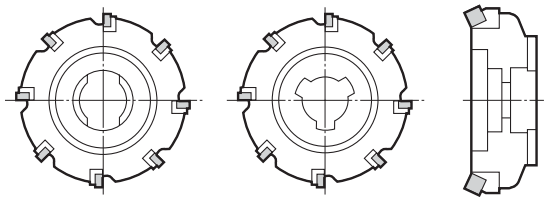
● Arbor specifications



QNF3R/L to QNF5R/L Shape

QNF6R/L Shape

● Cutter specifications



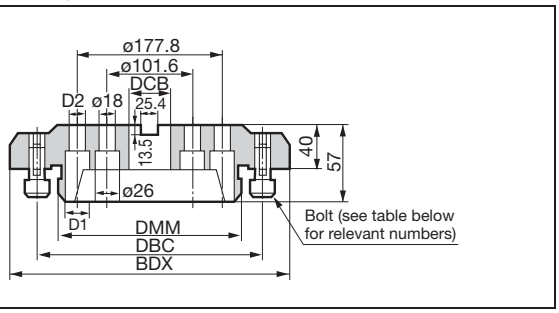
3 to 5 Inch

6 Inch

■ Two-piece Cutter with Slotted Hole

● Appearance of Slotted Hole type Body

● Adapter Specifications



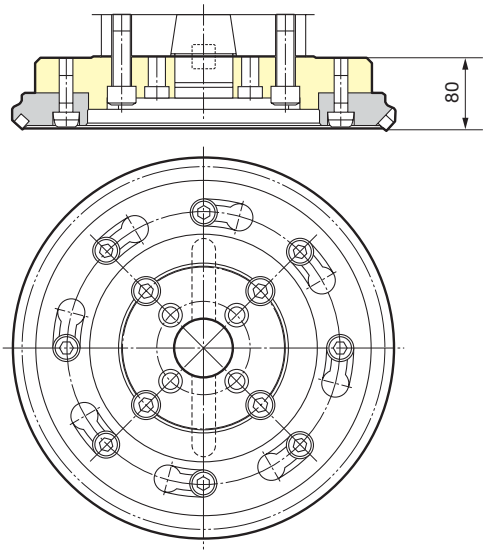
Dimensions (mm)

Cat. No.	Shank DMM	Maximum O.D. BDX	Hole Dia. DCB	Bolt D1	Bolt D2	Hole Position DBC	No. of Bolts n	Cutter Size (mm)
QAD 200	80	180	47.625	—	—	120	4	ø200
250	120	230	47.625	—	—	170	4	ø250
315	180	295	47.625	32	22	230	6	ø315
355	220	335	63.5	32	22	270	6	ø355
400	250	370	63.5	32	22	300	6	ø400
450	300	420	63.5	32	22	350	6	ø450

● Features and Applications

(1) Lightweight ring cutter body.
(2) Cutter can be changed without removing the bolt.
(3) A tapered spline system is used to connect the adapter to the cutter.
(4) Can be used for cutters over ø200.
(5) Effective when mounting several cutter body sizes on the same adapter.

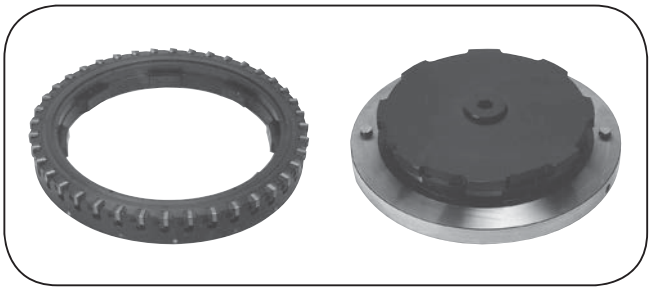
● Cutter Mounting Diagram



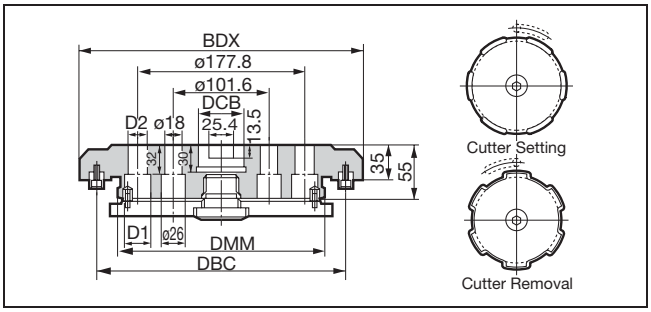
Applicable Cutter

■ Two-piece Cutter with Centre Bolt

● Appearance



● Adapter Specifications



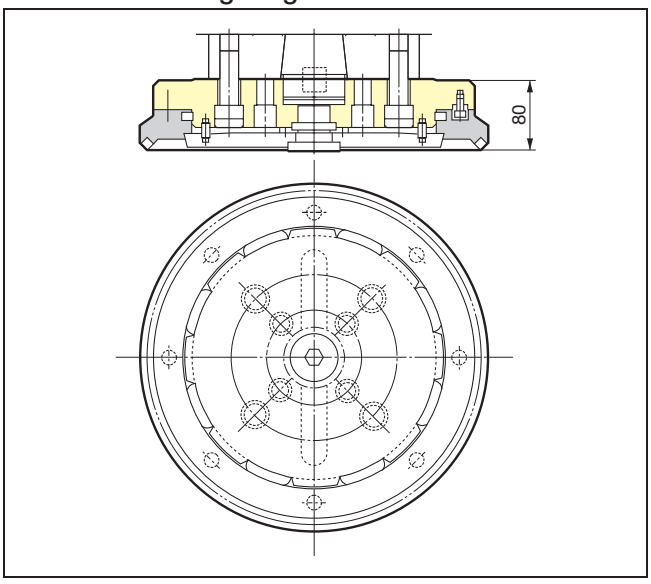
Dimensions (mm)

Cat. No.	Shank DMM	Maximum O.D. BDX	Hole Dia. DCB	Bolt D1	Bolt D2	Hole Position DBC	Cutter Size (mm)
NQAD 200	105	180	**47.625**	—	—	155	ø200
250	155	240	**47.625**	—	—	205	ø250
315	220	305	**47.625**	32	22	270	ø315
355	260	345	**63.5**	32	22	310	ø355
400	305	390	**63.5**	32	22	355	ø400
450	355	440	**63.5**	32	22	405	ø450

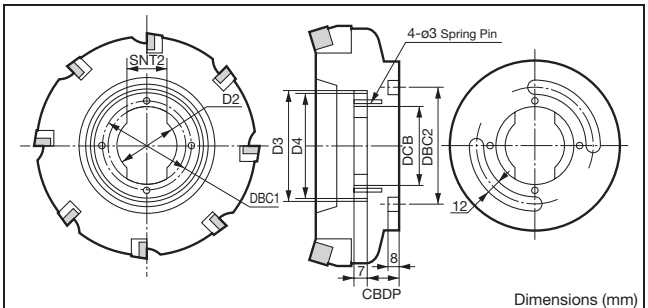
● Features and Applications

(1) With one clamping bolt, the total weight of the two-piece cutter is lighter.
(2) Cutter can be replaced quickly - simply turn one bolt halfway to mount and remove.
(3) A tapered spline system is used to connect the adapter to the cutter.
(4) Can be used for cutters over ø200.

● Cutter Mounting Diagram



■ Quick-F QF type Cutter Specifications

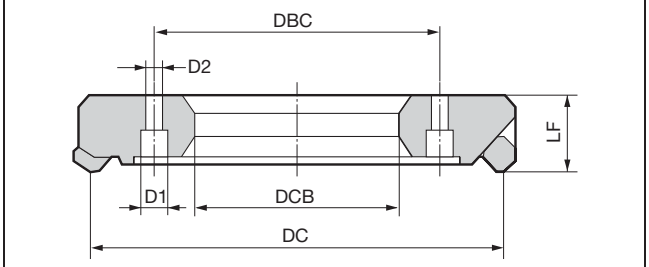


Dimensions (mm)

Cutter Size (mm)	Hole Dia. DCB	Bolt D2	Bolt D3	Diameter D4	Hole position DBC1	Hole Position DBC2	Keyway Width SNT2	Mounting Depth CBDP
ø100	31.75	22	43.75	43.5	37.75	55	20	24
ø125	38.1	29	50.1	49.8	44.1	55	22	22
ø160	50.8	41	62.8	62.5	56.8	68	26	22

This design applies to all F type high-feed cutters (→ H284 to H287). Conventional cutter can be easily adapted to quick change through slight modification.

■ QAD Cutter (Two-piece type) Specifications

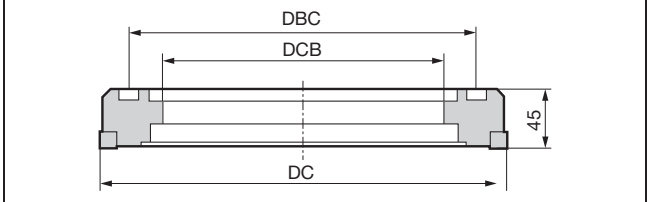


Dimensions (mm)

Cutter Size (mm)	Dia. DC	Hole Dia. DCB	Bolt D1	Bolt D2	Hole position DBC	Height LF	No. of Bolts n	Adapter Cat. No.
ø200	**200**	**80**	24	14	120	40	4	QAD200
ø250	**250**	**120**	30	18	170	40	4	QAD250
ø315	**315**	**180**	30	18	230	40	6	QAD315
ø355	**355**	**220**	30	18	270	40	6	QAD355
ø400	**400**	**250**	30	18	300	40	8	QAD400
ø450	**450**	**300**	30	18	350	40	8	QAD450

This design applies to the 2-piece type high-feed cutters (→ H284 to H287).

■ NQAD Cutter (Two-piece type with Centre Bolt) Specifications



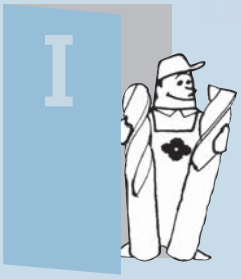
Dimensions (mm)

Cutter Size (mm)	Dia. DC	Hole Dia. DCB	Hole Position DBC	Adapter Cat. No.
ø200	**200**	**105**	155	NQAD200
ø250	**250**	**155**	205	NQAD250
ø315	**315**	**220**	270	NQAD315
ø355	**355**	**260**	310	NQAD355
ø400	**400**	**305**	355	NQAD400
ø450	**450**	**355**	405	NQAD450

This design applies to all two-piece type high-feed cutters with a centre bolt (→ H284 to H287).

Endmills I

I1 to I141



Selection Guides I2
Cutting Edge Length List by Diameter I6
Endmill Coating I15
GSX MILL series I16
SUMIDIA Coated SSDC series I21
SSEH series I22
Safe-Lock™ Compatible Endmill series I23
GS MILL Hard series I24
AURORA Coat Endmills I25
Mold Finish Master series I26

Square	General-Purpose	GSX MILL 2 Flutes	GSX 20000C-1.5D I30
		GSX MILL 2 Flutes	GSX 20000S-2D/20000C-2D I32, I36
		GSX MILL 2 Flutes	GSX 20000S-3D/20000C-3D I38, I40
		GSX MILL 2 Flutes	GSX 20000S-4D/20000C-4D I42, I44
		GSX MILL 3 Flutes	GSX 30000C-1.5D I46
		GSX MILL 3 Flutes	GSX 30000C-2D I48
		GSX MILL 4 Flutes	GSX 40000C-1.5D I50
		GSX MILL 4 Flutes	GSX 40000S-2D/40000C-2D I52, I54
		GSX MILL 4 Flutes	GSX 40000S-3D/40000C-3D I56, I58
		GSX MILL 4 Flutes	GSX 40000S-4D/40000C-4D I60, I62
		Spiral SSM 2 Flutes	SSM 2000 ..... I64
		Spiral SSM 4 Flutes	SSM 4000 ..... I68
	High Efficiency	GSX MILL Anti-vibration 4 Flutes	GSV 4000-2.5D I70
		GSX MILL Anti-vibration 4 Flutes	GSXVL 4000-2.5D I72
		UP MILL 4 Flutes	SSUP 4000ZX I74
		Long Neck UP MILL 4 Flutes	SSUPR 4000ZX I75
	Hardened Steel	GS MILL Hard 4/6/8 Flutes	GSH 4000SF/6000SF/8000SF I76, I77, I78
		Hard HHM 4/6/8 Flutes	HHM 4000ZX/6000ZX/8000ZX I79, I80, I81
		Hard LHHM 4/6/8 Flutes	LHHM 4000ZX/6000ZX/8000ZX I82, I83, I84
		Hard EHHM 4/6/8 Flutes	EHHM 4000ZX/6000ZX/8000ZX I85, I86, I87
	Roughing	GS MILL Roughing 4 Flutes	GSRE 4000SF I88
	Non-Ferrous Metal	Non-Ferrous Metals AURORA Coat 2/4 Flutes	ASM 2000DL/4000DL I90, I91
		Non-Ferrous Metals 2 Flutes	ASM 2000 ..... I92
		Non-Ferrous Metals SUMIDIA 2/4 Flutes	DFE I93
		Non-Ferrous Metals SUMIDIA 1/2 Flutes	DAE I95
	CFRP Graphite	SUMIDIA Coated for CFRP 4 Flutes	SSDC 4000(RL) I97
Radius		GSX MILL 4 Flutes	GSX 40000-R-2D I98
		GSX MILL Anti-vibration 4 Flutes	GSV 4000-R-2.5D I100
		GSX MILL Anti-vibration 4 Flutes	GSXVL 4000-R-2.5D I102
		Exotic Alloy SSEH Anti-vibration 4 Flutes	SSEHVL 4000W-R/4000WS-R I104, I106
		Exotic Alloy SSEH 4 Flutes	SSEH 4000W-R/4000WS-R I108, I110
		UP MILL 4 Flutes	SSUP 4000ZX-R I112
		Long Neck UP MILL 4 Flutes	SSUPR 4000ZX-R I114
		GS MILL Hard 6/8 Flutes	GSH 6000SF-R/8000SF-R I116, I117
		Exotic Alloy SSEH Anti-vibration 4 Flutes	SSEHVL 4000-R I118
		Exotic Alloy SSEH 4 Flutes	SSEH 4000-R I119
		Mold Finish Master series 1 Flute	NPDRS I120
		Mold Finish Master series 2 Flutes	BNBR I122
Ballnose		GSX MILL Ballnose 2 Flutes	GSXB 20000 ..... I124
		GS MILL Hard Ballnose 2 Flutes	GSBH 20000SF I126
		Non-Ferrous Metals AURORA Coat Ballnose 2 Flutes	SNB 2000DL I127
		Non-Ferrous Metals AURORA Coat Long Neck Ballnose 2 Flutes	SNB2 ..... I128
		Mold Finish Master series 1 Flute	NPDBS/NPDB I130, I131
		SUMIDIA Coated Ballnose 2 Flutes	SDCB I132
		Mold Finish Master series 2 Flutes	BNBP/BNBC I134, I136
Multi-Purpose		GSX MILL Slot 3 Flutes	GSXSLT 30000C-1.5D ..... I 138
		UP MILL 3 Flutes	SSUP 3000ZX ..... I 140

Stock Markings and Symbols

- ● ● mark: Standard stocked item
- ● mark: To be replaced with the new item featured on the same page
- ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
- * mark: Semi-standard stock (please confirm stock availability)
- ○ mark: Stock or planned stock (please confirm stock availability)
- Blank: Made-to-order item
- — mark: Not available

Square Endmill Selection Guides

◉ : Best (1st Recommendation)
◎ : Best, ○ : Good, Blank: Not recommended, ×: Unsuitable

Applications / Features	Diameter DC (Min. to Max.) (mm)	Series Name / Series Code	Ref. Page	Appearance	Work Material: P — General Structure Rolled Steel	P — Carbon Steel	P — Alloy Steel	P — Pre-hardened Steel	P — Tempered Steel/Die Steel	H — Hardened Steel 45 to 55HRC	H — Hardened Steel 55 to 60HRC	H — Hardened Steel 60 up HRC	M — Stainless Steel	S — Titanium Alloy/Heat-Resistant Alloy	K — Cast Iron	N — Aluminum Alloy	N — Copper Alloy	N — Graphite	N — CFRP
General-Purpose	ø0.5 to 25	GSXMILL 2 Flutes GSX 20000C	I30,I36, I40,I44		◉	◉	◉	◉	◉	◉	○		◉	○	◉				
	ø0.5 to 25 (2D: ø0.3 to 25)	GSXMILL 2 Flutes GSX 20000S	I32 to I34, I38, I42		○	◎	◎	◎	◎	◎	○		◎	○	○				
	ø1 to 12	GSXMILL 3 Flutes GSX 30000C	I46,I48		○	◎	◎	◎	◎	◎			◎	○	○				
	ø1 to 25	GSXMILL 4 Flutes GSX 40000C	I50,I54, I58,I62		◉	◉	◉	◉	◉	◉	○		◉	○	◉				
	ø1 to 25	GSXMILL 4 Flutes GSX 40000S	I52,I56, I60		○	◎	◎	◎	◎	◎	○		◎	○	○				
	ø0.2 to 30	Solid Carbide Spiral 2 Flutes SSM 2000	I64		○	◎									○	○			
	ø1.5 to 25	Solid Carbide Spiral 4 Flutes SSM 4000	I68		○	◎									○	○			
High Efficiency	ø2 to 25	GSXMILL Anti-vibration 4 Flutes GSXVL 4000	I72		◉	◉	◉	◉	◉	◉	○		◉	○	○				
	ø2 to 25	GSV Anti-vibration 4 Flutes GSV 4000	I70		◎	◎	◎	◎	◎	◎	○		◎	○	○				
	ø2 to 20	UPMILL SSUP 4000ZX	I74		◎	◎	◎	◎	◎		○		◎	○	○				
	ø3 to 20	UPMILL Long Neck SSUPR 4000ZX	I75		◎	◎	◎	◎	◎	◎	○		◎	○	○				
Hardened Steel	④ ø1 to 2 ⑥ ø3 to 12 ⑧ ø16 to 20	GS MILL Hard GSH 4/6/8000SF	I76 to I78		◉	◉	◉	◉	◉	◉	◉								
	④ ø3 to 5 ⑥ ø6 to 12 ⑧ ø16 to 32	Hard HHM 4/6/8000ZX	I79 to I81		○	○	○	◎	◎	◎	◎								
	④ ø3 to 5 ⑥ ø6 to 12 ⑧ ø16 to 32	Long Hard LHHM 4/6/8000ZX	I82 to I84		○	○	○	◎	◎	◎	○								
	④ ø3 to 5 ⑥ ø6 to 12 ⑧ ø16 to 32	Extra-Long Hard EHHM 4/6/8000ZX	I85 to I87		○	○	○	◎	◎	◎	○								
Roughing	ø6 to 20	GS MILL Roughing GSRE 4000SF	I88		◎	◎	◎	◎	◎	◎			◎	○	◎				

④⑥⑧: No. of Flutes

■ Examples of Icons on Product Stock Pages

Coating: GS Coat, GS HARD Coat, GSX Coat, ZX Coat, AURORA Coat DLC, SUMIDIA Coat

No. of Flutes: 1 Flute, 2 Flutes, 3 Flutes, 4 Flutes, 6 Flutes, 8 Flutes

Shape: Corner, Corner, Radius r, Ballnose R, 15° Helix Angle

Applications: Shoulder Milling, Groove Milling, Helical Milling, Ramping, Profiling

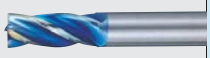
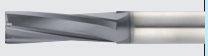
Our square endmill cutting edge shapes have concave ends.

Therefore, they do not make flat bottoms in spot facing.

If a flat bottom is required, we recommend using the **Flat MULTIDRILL MDF type.** ☞ J26

Square Endmill Selection Guides

◉ : Best (1st Recommendation)
◎ : Best, ○ : Good, Blank: Not recommended, ×: Unsuitable

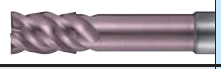
Applications / Features	Diameter DC (Min. to Max.) (mm)	Series Name / Series Code	Ref. Page	Appearance	Work Material: P: General Structure Rolled Steel	P: Carbon Steel	P: Alloy Steel	P: Pre-hardened Steel	P: Tempered Steel/Die Steel	H: Hardened Steel 45 to 55HRC	H: Hardened Steel 55 to 60HRC	H: Hardened Steel 60 up HRC	M: Stainless Steel	S: Titanium Alloy/Heat-Resistant Alloy	K: Cast Iron	N: Aluminum Alloy	N: Copper Alloy	N: Graphite	N: CFRP
Aluminum and Non-Ferrous Metal	ø2 to 16	AURORA Coat 2 Flutes ASM 2000DL	I90													◉	○		
	ø2 to 16	AURORA Coat 4 Flutes ASM 4000DL	I91													◎	◎		
	ø2 to 16	Solid Carbide Endmills for Non-ferrous Cutting ASM 2000	I92													◎	○		
	①ø4 to 5 ②ø6 to 12	SUMIDIA Endmills DAE series DAE	I95, I96		×	×	×	×	×	×	×	×	×	×	×	◎	◎	○	
	②ø4 to 10 ④ø9 to 13	SUMIDIA Endmills DFE series DFE	I93, I94		×	×	×	×	×	×	×	×	×	×	×	◎	◎	○	
CFRP/ Graphite	ø6 to 12	SUMIDIA Coated SSDC SSDC 4000	I97		×	×	×	×	×	×	×	×	×	×	×			○	◉
	ø6 to 12	SUMIDIA Coated SSDCRL SSDC 4000RL	I97		×	×	×	×	×	×	×	×	×	×	×			○	◉
Multi-Purpose	ø1 to 12	GSX MILL Slot 3 Flutes GSXSLT 30000C	I138		○	◉	◉	◉	◉	◉			◉	○	○				
	ø2 to 16	UPMILL Slot SSUP 3000ZX	I140		◎	◎	◎	◎	◎	◎	○		◎	○	○				

①②④: No. of Flutes

Target Work Material (What to machine?)	Cutting Applications	Recommended Tool	Ref. Page
Steel, Cast Iron, Stainless Steel, Titanium Alloy	High-efficiency Machining Chatter Countermeasures	GSXVL GSV	I72 I70
	Medium Finishing to Finishing (Good Machining Accuracy)	GSX	I30 to I63
	Medium Finishing (Medium Stock Removal)	GSH	I76 to I78
	Roughing (Large Stock Removal)	GSXVL GSRE	I72 I88
Hardened Steel (45HRC up)	All Hardened Steels	GSH	I76 to I78
Aluminum Alloy	All Aluminum Alloys	ASM	I90 to I92
CFRP, Graphite	Roughing, Cut-off	SSDC SSDCRL	I97

Corner Radius Endmill Selection Guide

◉ : Best (1st Recommendation)
◎ : Best, ○ : Good, Blank: Not recommended, ×: Unsuitable

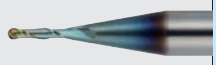
Applications / Features	Diameter DC (Min. to Max.) (mm)	Series Name / Series Code	Ref. Page	Appearance	Work Material: P: General Structure Rolled Steel	P: Carbon Steel	P: Alloy Steel	P: Pre-hardened Steel	P: Tempered Steel/Die Steel	H: Hardened Steel 45 to 55HRC	H: Hardened Steel 55 to 60HRC	H: Hardened Steel 60 up HRC	M: Stainless Steel	S: Titanium Alloy/Heat-Resistant Alloy	K: Cast Iron	N: Aluminum Alloy	N: Copper Alloy	N: Graphite	N: CFRP
General Endmilling with Corner Radius	ø3 to 12	GSX MILL Radius GSX 40000-R	I98		◎	◎	◎	◎	◎	◎			◎	○	○				
High-efficiency Endmilling with Corner Radius	ø3 to 25	GSX MILL Anti-vibration Radius	I102		○	◉	◉	◉	◉	◉	○		◉	○	○				
	ø3 to 25	GSV Anti-vibration Radius GSV 4000-R	I100		○	◎	◎	◎	◎	◎	○		◎	○	○				
	ø3 to 20	UPMILL Radius SSUP 4000ZX-R	I112		◎	◎	◎	◎	◎	◎	○		◎	○	◎				
	ø3 to 20	UPMILL Long Neck Radius SSUPR 4000ZX-R	I114		◎	◎	◎	◎	◎				○		◎				
Hardened Steel Endmilling with Corner Radius	⑥ ø6 to 12 ⑧ ø16 to 20	GS MILL Hard Radius GSH 6/8000SF-R	I116 to I117			◉	◉	◉	◉	◉	◉	◉							
Exotic Alloy	ø4.5 to 25 ø12 to 25	SSEH Anti-vibration Radius SSEHVL 4000W(S)-R	I104, I106										◉	◉					
	ø4.5 to 25 ø12 to 25	SSEH Radius SSEH 4000W(S)-R	I108, I110										◎	◎					
	ø4.5 to 16	SSEH Anti-vibration Radius SSEHVL 4000-R	I118										○	◎					
	ø4.5 to 16	SSEH Radius SSEH 4000-R	I119										○	◎					
High-precision Mold Profiling	ø0.2 to 2	Mold Finish Master SUMIBORON Radius Endmills BNBR	I122					○		○	◎	◎				×	×		
Cemented Carbide and Hard Brittle Material	ø0.2 to 2	Mold Finish Master SUMIDIA BINDERLESS Radius Endmills NPDRS	I120		Cemented Carbide					◎			Hard Brittle Material						○

⑥⑧: No. of Flutes SAFE-LOCK™ Applicable Products

Target Work Material (What to machine?)	Cutting Applications	Recommended Tool	Ref. Page
Steel, Cast Iron, Stainless Steel, Titanium Alloy	High-efficiency Machining Chatter Countermeasures	GSXVL GSV	I102 I100
	Medium Finishing to Finishing (Good Machining Accuracy)	GSX SSUP	I98 I112
	Roughing (Large Stock Removal)	GSXVL	I102
	Stainless Steel, Titanium Alloy	SSEH SSEHVL	I108,I110 I104,I106 I118,I119
Hardened Steel (45HRC up)	Hardened Steel Overall Endmilling with Corner Radius	GSH	I116,I117
	High-precision Mold Profiling	BNBR	I122
CFRP, Graphite	Roughing, Cut-off	SSDC SSDCRL	I97
Cemented Carbide, Hard Brittle Materials	Finishing	NPDRS	I120

Ballnose Endmill Selection Guide

●: Best (1st Recommendation)
◎: Best, ○: Good, Blank: Not recommended, ×: Unsuitable

Applications / Features	Ballnose Radius (Min. to Max.) / Tolerance (mm)	Series Name / Series Code	Ref. Page	Appearance	Work Material: P — General Structure Rolled Steel	P — Carbon Steel	P — Alloy Steel	P — Pre-hardened Steel	P — Tempered Steel/Die Steel	H — Hardened Steel 45 to 55HRC	H — Hardened Steel 55 to 60HRC	H — Hardened Steel 60 up HRC	M — Stainless Steel	S — Titanium Alloy/Heat-Resistant Alloy	K — Cast Iron	N — Aluminum Alloy	N — Copper Alloy	N — Graphite	N — CFRP
General-Purpose	R0.2 to 10 ± 0.01	GSXMILL Ballnose GSXB 20000	I124		●	●	●	●	●	●	○		●	○	○				
Hardened Steel	R0.2 to 6 ±0.003 up to -0.007	GS MILL HARD Ballnose GSBH 20000SF	I126			◎	◎	◎	○	◎	●	●							
Aluminum and Non-Ferrous Metal	R1 to 8 ± 0.01	AURORA Coat Ballnose SNB 2000DL	I127													◎	◎		
Copper Electrodes	R0.05 to 2 ± 0.005	AURORA Coat Long Neck Ballnose Endmills SNB2	I128													◎	●		
	R0.1 to 0.5 ± 0.005	Mold Finish Master SUMIBORON Ballnose Endmills BNBC	I136														●		
High-precision Mold Profiling	R0.2 to 1 ± 0.005	Mold Finish Master SUMIBORON Ballnose Endmills BNBP	I134					○		○	◎	◎				×	×		
Cemented Carbide and Hard Brittle Material	R0.1 to 1	Mold Finish Master SUMIDIA BINDERLESS Ballnose Endmills NPDBS (For Standard Finishing)	I130		Cemented Carbide					◎			Hard Brittle Material		○				
	R0.1 to 1	Mold Finish Master SUMIDIA BINDERLESS Ballnose Endmills NPDB (For Precision Finishing)	I131		Cemented Carbide					◎			Hard Brittle Material		○				
	R0.5 to 1	SUMIDIA Coat Ballnose Endmills SDCB	I132		Cemented Carbide					◎			Hard Brittle Material		○				

Target Work Material (What to machine?)	Cutting Applications	Recommended Tool	Ref. Page
Steel, Cast Iron, Stainless Steel, Titanium Alloy	General Machining	GSXB	I124
Hardened Steel (45HRC up)	All Hardened Steels	GSBH	I126
	High-precision Mold Profiling	BNBP	I134
Aluminum Alloy Copper Alloy	All Aluminum Alloys, Copper	SNB	I127,I128
Copper Electrodes	Copper Alloy Overall	SNB2 BNBC	I128 I136
Cemented Carbide, Hard Brittle Materials	Roughing to Medium Finishing	SDCB	I132
	Finishing	NPDBS (Standard Finishing) NPDB (Precision Finishing)	I130 I131

Cutting Edge Length List by Diameter

Diameter ø0.2 to ø1.6mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
0.2	0.5	SSM 2002	40.0	I64
0.3	0.6	GSX 20030S-2D	40.0	I32
	1.0	SSM 2003	40.0	I64
0.4	0.8	GSX 20040S-2D	40.0	I32
	1.0	SSM 2004	40.0	I64
0.5	1.0	GSX 20050C-1.5D	40.0	I30
		GSX 20050C-2D	40.0	I36
	1.3	GSX 20050S-2D	40.0	I32
	1.5	GSX 20050C-3D	40.0	I40
		GSX 20050S-3D	40.0	I38
		SSM 2005	40.0	I64
	2.0	GSX 20050C-4D	40.0	I44
		GSX 20050S-4D	40.0	I42
0.6	1.3	GSX 20060S-2D	40.0	I32
	1.5	SSM 2006	40.0	I64
0.7	1.4	GSX 20070S-2D	40.0	I32
	1.5	SSM 2007	40.0	I64
0.8	1.6	GSX 20080S-2D	40.0	I32
	2.0	SSM 2008	40.0	I64
0.9	1.8	GSX 20090S-2D	40.0	I32
	2.0	SSM 2009	40.0	I64
1.0	1.5	GSX 20100C-1.5D	40.0	I30
		GSX 30100C-1.5D	40.0	I46
		GSX 40100C-1.5D	40.0	I50
		GSXSLT 30100C-1.5D	40.0	I138
	2.0	GSX 20100C-2D	40.0	I36
		GSX 40100C-2D	40.0	I54
	2.5	GSX 20100S-2D	40.0	I32
		GSX 30100C-2D	40.0	I48
		GSX 40100S-2D	40.0	I52
		GSX 40100S-2D-S3	38.0	I52
	3.0	GSH 4010SF	50.0	I76
		GSX 20100C-3D	40.0	I40
		GSX 20100S-3D	40.0	I38
		GSX 40100C-3D	40.0	I58
		GSX 40100S-3D	40.0	I56
		SSM 2010	40.0	I64
	4.0	GSX 20100C-4D	40.0	I44
		GSX 40100C-4D	40.0	I62
		GSX 40100S-4D	40.0	I60
	5.0	GSX 20100S-4D	40.0	I42
1.1	2.5	GSX 20110S-2D	40.0	I32
	3.0	SSM 2011	40.0	I64
1.2	2.5	GSX 20120S-2D	40.0	I32
	3.0	SSM 2012	40.0	I64
1.3	2.6	GSX 20130S-2D	40.0	I32
	3.0	SSM 2013	40.0	I64
1.4	2.8	GSX 20140S-2D	40.0	I32
	3.0	SSM 2014	40.0	I64
1.5	2.3	GSX 20150C-1.5D	40.0	I30
		GSX 30150C-1.5D	40.0	I46
		GSX 40150C-1.5D	40.0	I50
		GSXSLT 30150C-1.5D	40.0	I138
	3.0	GSX 20150C-2D	40.0	I36
		GSX 40150C-2D	40.0	I54
	3.8	GSX 20150S-2D	40.0	I32
		GSX 20150S-2D-S3	38.0	I32
		GSX 30150C-2D	40.0	I48
		GSX 40150S-2D	40.0	I52
	4.0	GSH 4015SF	50.0	I76
	4.5	GSX 20150C-3D	40.0	I40
		GSX 20150S-3D	40.0	I38
		GSX 40150C-3D	40.0	I58
		GSX 40150S-3D	40.0	I56
	5.0	SSM 2015	40.0	I64
		SSM 4015	40.0	I68
	6.0	GSX 20150C-4D	40.0	I44
		GSX 40150C-4D	40.0	I62
		GSX 40150S-4D	40.0	I60
	7.0	GSX 20150S-4D	40.0	I42
1.6	3.8	GSX 20160S-2D	40.0	I32
	5.0	SSM 2016	40.0	I64

Diameter ø1.7 to ø2.8mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
1.7	3.8	GSX 20170S-2D	40.0	I32
	5.0	SSM 2017	40.0	I64
1.8	3.8	GSX 20180S-2D	40.0	I32
	5.0	SSM 2018	40.0	I64
1.9	3.8	GSX 20190S-2D	40.0	I32
	5.0	SSM 2019	40.0	I64
2.0	3.0	GSX 20200C-1.5D	40.0	I30
		GSX 30200C-1.5D	40.0	I46
		GSX 40200C-1.5D	40.0	I50
		GSXSLT 30200C-1.5D	40.0	I138
	4.0	GSX 20200C-2D	40.0	I36
		GSX 40200C-2D	40.0	I54
	5.0	GSV 4020-2.5D	50.0	I70
		GSX 20200S-2D	40.0	I32
		GSX 20200S-2D-S3	38.0	I32
		GSX 30200C-2D	40.0	I48
		GSX 40200S-2D	40.0	I52
		GSX 40200S-2D-S3	38.0	I52
		GSXVL 4020-2.5D	50.0	I72
	6.0	ASM 2020	40.0	I92
		ASM 2020DL	40.0	I90
		ASM 4020DL	40.0	I91
		GSH 4020SF	50.0	I76
		GSX 20200C-3D	40.0	I40
		GSX 20200S-3D	40.0	I38
		GSX 40200C-3D	40.0	I58
		GSX 40200S-3D	40.0	I56
		SSM 2020	40.0	I64
		SSM 4020	40.0	I68
		SSUP 3020ZX	50.0	I140
		SSUP 4020ZX	50.0	I74
	8.0	GSX 20200C-4D	40.0	I44
		GSX 40200C-4D	40.0	I62
		GSX 40200S-4D	40.0	I60
	9.0	GSX 20200S-4D	40.0	I42
2.1	6.0	GSX 20210S-2D	40.0	I32
		SSM 2021	40.0	I64
2.2	6.0	GSX 20220S-2D	40.0	I32
		SSM 2022	40.0	I64
2.3	6.0	GSX 20230S-2D	40.0	I32
		SSM 2023	40.0	I64
2.4	6.0	GSX 20240S-2D	40.0	I32
		SSM 2024	40.0	I64
2.5	3.8	GSX 20250C-1.5D	40.0	I30
		GSX 30250C-1.5D	40.0	I46
		GSX 40250C-1.5D	40.0	I50
		GSXSLT 30250C-1.5D	40.0	I138
	5.0	GSX 20250C-2D	40.0	I36
		GSX 40250C-2D	40.0	I54
	6.3	GSX 20250S-2D	40.0	I32
		GSX 30250C-2D	40.0	I48
		GSX 40250S-2D	40.0	I52
	7.5	GSX 20250C-3D	40.0	I40
		GSX 20250S-3D	40.0	I38
		GSX 40250C-3D	40.0	I58
	8.0	GSX 40250S-3D	40.0	I56
		SSM 2025	40.0	I64
		SSM 4025	40.0	I68
		SSUP 3025ZX	50.0	I140
	10.0	GSX 20250C-4D	50.0	I44
		GSX 40250C-4D	50.0	I62
		GSX 40250S-4D	50.0	I60
	12.0	GSX 20250S-4D	50.0	I42
2.6	7.0	GSX 20260S-2D	40.0	I32
	8.0	GSX 20260S-3D	50.0	I38
		SSM 2026	40.0	I64
2.7	7.0	GSX 20270S-2D	40.0	I32
	8.0	SSM 2027	40.0	I64
	8.5	GSX 20270S-3D	50.0	I38
2.8	7.0	GSX 20280S-2D	40.0	I32
	8.0	SSM 2028	40.0	I64
	9.0	GSX 20280S-3D	50.0	I38

Cutting Edge Length List by Diameter

Diameter ø2.9 to ø4.0mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
2.9	7.0	GSX 20290S-2D	40.0	I32
	8.0	SSM 2029	40.0	I64
	9.0	GSX 20290S-3D	50.0	I38
3.0	4.5	GSX 20300C-1.5D	45.0	I30
		GSX 30300C-1.5D	45.0	I46
		GSX 40300C-1.5D	45.0	I50
		GSXSLT 30300C-1.5D	45.0	I138
		SSUPR 4030ZX	60.0	I75
	6.0	GSX 20300C-2D	45.0	I36
		GSX 40300C-2D	45.0	I54
	7.5	GSX 20300S-2D	45.0	I32
		GSX 20300S-2D-S3	38.0	I32
		GSX 30300C-2D	45.0	I48
		GSX 40300S-2D	45.0	I52
		GSX 40300S-2D-S3	38.0	I52
	8.0	GSH 6030SF	50.0	I77
		GSV 4030-2.5D	50.0	I70
		GSXVL 4030-2.5D	50.0	I72
		HHM 4030ZX	50.0	I79
		SSM 2030	45.0	I64
		SSM 4030	45.0	I68
		SSUP 3030ZX	50.0	I140
		SSUP 4030ZX	50.0	I74
	9.0	GSX 20300C-3D	50.0	I40
		GSX 20300S-3D	50.0	I38
		GSX 40300C-3D	50.0	I58
		GSX 40300S-3D	50.0	I56
	10.0	ASM 2030	45.0	I92
		ASM 2030DL	45.0	I90
		ASM 4030DL	45.0	I91
	12.0	GSX 20300C-4D	50.0	I44
		GSX 20300S-4D	50.0	I42
		GSX 40300C-4D	50.0	I62
		GSX 40300S-4D	50.0	I60
		LHHM 4030ZX	55.0	I82
	20.0	EHHM 4030ZX	60.0	I85
3.1	7.5	GSX 20310S-2D	45.0	I32
	8.0	SSM 2031	45.0	I64
3.2	7.5	GSX 20320S-2D	45.0	I32
	8.0	SSM 2032	45.0	I64
3.3	7.5	GSX 20330S-2D	45.0	I32
	8.0	SSM 2033	45.0	I64
3.4	7.5	GSX 20340S-2D	45.0	I32
	8.0	SSM 2034	45.0	I64
3.5	5.3	GSX 20350C-1.5D	45.0	I30
		GSX 40350C-1.5D	45.0	I50
	7.0	GSX 20350C-2D	45.0	I36
		GSX 40350C-2D	45.0	I54
	8.0	SSM 2035	45.0	I64
		SSM 4035	45.0	I68
	8.8	GSX 20350S-2D	45.0	I32
		GSX 40350S-2D	45.0	I52
	10.0	SSUP 3035ZX	50.0	I140
	11.0	GSX 20350C-3D	50.0	I40
		GSX 40350C-3D	50.0	I58
		GSX 40350S-3D	50.0	I56
	12.0	GSX 20350S-3D	50.0	I38
	14.0	GSX 20350C-4D	50.0	I44
		GSX 20350S-4D	50.0	I42
		GSX 40350C-4D	50.0	I62
		GSX 40350S-4D	50.0	I60
3.6	8.8	GSX 20360S-2D	45.0	I32
	10.0	SSM 2036	45.0	I64
3.7	8.8	GSX 20370S-2D	45.0	I32
	10.0	SSM 2037	45.0	I64
3.8	8.8	GSX 20380S-2D	45.0	I32
3.8	10.0	SSM 2038	45.0	I64
3.9	8.8	GSX 20390S-2D	45.0	I32
	10.0	SSM 2039	45.0	I64
4.0	6.0	GSX 20400C-1.5D	45.0	I30
		GSX 30400C-1.5D	45.0	I46
		GSX 40400C-1.5D	45.0	I50

Diameter ø4.0 to ø5.0mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
4.0	6.0	GSXSLT 30400C-1.5D	45.0	I138
		SSUPR 4040ZX	60.0	I75
	8.0	GSX 20400C-2D	45.0	I36
		GSX 40400C-2D	45.0	I54
	10.0	GSV 4040-2.5D	50.0	I70
		GSXVL 4040-2.5D	50.0	I72
		HHM 4040ZX	50.0	I79
		SSM 2040	45.0	I64
		SSM 4040	45.0	I68
	11.0	GSH 6040SF	50.0	I77
		GSX 20400S-2D	45.0	I32
		GSX 20400S-2D-S4	45.0	I32
		GSX 30400C-2D	45.0	I48
		GSX 40400S-2D	45.0	I52
		GSX 40400S-2D-S4	45.0	I52
		SSUP 3040ZX	50.0	I140
		SSUP 4040ZX	50.0	I74
	12.0	ASM 2040	45.0	I92
		ASM 2040DL	45.0	I90
		ASM 4040DL	45.0	I91
		GSX 20400C-3D	50.0	I40
		GSX 20400S-3D	50.0	I38
		GSX 40400C-3D	50.0	I58
		GSX 40400S-3D	50.0	I56
	15.0	LHHM 4040ZX	60.0	I82
	16.0	GSX 20400C-4D	50.0	I44
		GSX 20400S-4D	50.0	I42
		GSX 40400C-4D	50.0	I62
		GSX 40400S-4D	50.0	I60
	25.0	EHHM 4040ZX	65.0	I85
4.1	10.0	SSM 2041	45.0	I64
	11.0	GSX 20410S-2D	45.0	I32
4.2	10.0	SSM 2042	45.0	I64
	11.0	GSX 20420S-2D	45.0	I32
4.3	10.0	SSM 2043	45.0	I64
	11.0	GSX 20430S-2D	45.0	I32
4.4	10.0	SSM 2044	45.0	I64
	11.0	GSX 20440S-2D	45.0	I33
4.5	6.8	GSX 20450C-1.5D	50.0	I30
		GSX 40450C-1.5D	50.0	I50
	9.0	GSX 20450C-2D	50.0	I36
		GSX 40450C-2D	50.0	I54
	10.0	SSM 2045	45.0	I64
		SSM 4045	45.0	I68
	11.0	SSUP 3045ZX	50.0	I140
	11.3	GSX 20450S-2D	50.0	I33
		GSX 40450S-2D	50.0	I52
	14.0	GSX 20450C-3D	50.0	I40
		GSX 40450C-3D	50.0	I58
	15.0	GSX 20450S-3D	50.0	I38
		GSX 40450S-3D	50.0	I56
	18.0	GSX 20450C-4D	60.0	I44
		GSX 20450S-4D	60.0	I42
		GSX 40450C-4D	60.0	I62
		GSX 40450S-4D	60.0	I60
4.6	11.3	GSX 20460S-2D	50.0	I33
	12.0	SSM 2046	50.0	I64
4.7	11.3	GSX 20470S-2D	50.0	I33
	12.0	SSM 2047	50.0	I65
4.8	11.3	GSX 20480S-2D	50.0	I33
	12.0	SSM 2048	50.0	I65
4.9	11.3	GSX 20490S-2D	50.0	I33
	12.0	SSM 2049	50.0	I65
5.0	7.5	GSX 20500C-1.5D	50.0	I30
		GSX 30500C-1.5D	50.0	I46
		GSX 40500C-1.5D	50.0	I50
		GSXSLT 30500C-1.5D	50.0	I138
		SSUPR 4050ZX	60.0	I75
	10.0	GSX 20500C-2D	50.0	I36
		GSX 40500C-2D	50.0	I54
	12.0	HHM 4050ZX	50.0	I79
		SSM 2050	50.0	I65

Cutting Edge Length List by Diameter

Diameter ø5.0 to ø6.0mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
5.0	12.0	SSM 4050	50.0	I68
	13.0	GSH 6050SF	50.0	I77
		GSV 4050-2.5D	60.0	I70
		GSX 20500S-2D	50.0	I33
		GSX 30500C-2D	50.0	I48
		GSX 40500S-2D	50.0	I52
		GSXVL 4050-2.5D	60.0	I72
		SSUP 3050ZX	60.0	I140
		SSUP 4050ZX	60.0	I74
	15.0	ASM 2050	50.0	I92
		ASM 2050DL	50.0	I90
		ASM 4050DL	50.0	I91
		GSX 20500C-3D	50.0	I40
		GSX 20500S-3D	50.0	I38
		GSX 40500C-3D	50.0	I58
		GSX 40500S-3D	50.0	I56
	18.0	LHHM 4050ZX	60.0	I82
	20.0	GSX 20500C-4D	60.0	I44
		GSX 20500S-4D	60.0	I42
		GSX 40500C-4D	60.0	I62
		GSX 40500S-4D	60.0	I60
	30.0	EHHM 4050ZX	70.0	I85
5.1	12.0	SSM 2051	50.0	I65
	13.0	GSX 20510S-2D	50.0	I33
5.2	12.0	SSM 2052	50.0	I65
	13.0	GSX 20520S-2D	50.0	I33
5.3	12.0	SSM 2053	50.0	I65
	13.0	GSX 20530S-2D	50.0	I33
5.4	12.0	SSM 2054	50.0	I65
	13.0	GSX 20540S-2D	50.0	I33
5.5	8.3	GSX 20550C-1.5D	50.0	I30
		GSX 40550C-1.5D	50.0	I50
	11.0	GSX 20550C-2D	50.0	I36
		GSX 40550C-2D	50.0	I54
	12.0	SSM 2055	50.0	I65
		SSM 4055	50.0	I68
	13.0	GSX 20550S-2D	50.0	I33
		GSX 40550S-2D	50.0	I52
		SSUP 3055ZX	60.0	I140
	17.0	GSX 20550C-3D	50.0	I40
		GSX 40550C-3D	50.0	I58
	18.0	GSX 20550S-3D	50.0	I38
		GSX 40550S-3D	50.0	I56
	22.0	GSX 20550C-4D	60.0	I44
		GSX 20550S-4D	60.0	I42
		GSX 40550C-4D	60.0	I62
		GSX 40550S-4D	60.0	I60
5.6	12.0	SSM 2056	50.0	I65
	13.0	GSX 20560S-2D	50.0	I33
5.7	12.0	SSM 2057	50.0	I65
	13.0	GSX 20570S-2D	50.0	I33
5.8	12.0	SSM 2058	50.0	I65
	13.0	GSX 20580S-2D	50.0	I33
5.9	12.0	SSM 2059	50.0	I65
	13.0	GSX 20590S-2D	50.0	I33
6.0	9.0	GSX 20600C-1.5D	50.0	I30
		GSX 30600C-1.5D	50.0	I46
		GSX 40600C-1.5D	50.0	I50
		GSXSLT 30600C-1.5D	50.0	I138
		SSUPR 4060ZX	60.0	I75
	12.0	GSX 20600C-2D	50.0	I36
		GSX 40600C-2D	50.0	I54
		HHM 6060ZX	50.0	I80
		SSM 2060	50.0	I65
		SSM 4060	50.0	I68
	13.0	GSH 6060SF	50.0	I77
		GSRE 4060SF	50.0	I88
		GSX 20600S-2D	50.0	I33
		GSX 30600C-2D	50.0	I48
		GSX 40600S-2D	50.0	I52
		SSUP 3060ZX	60.0	I140
		SSUP 4060ZX	60.0	I74

Diameter ø6.0 to ø7.0mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
6.0	15.0	ASM 2060	50.0	I92
		ASM 2060DL	50.0	I90
		ASM 4060DL	50.0	I91
		GSV 4060-2.5D	60.0	I70
		GSXVL 4060-2.5D	60.0	I72
	18.0	GSX 20600C-3D	50.0	I40
		GSX 20600S-3D	50.0	I38
		GSX 40600C-3D	50.0	I58
		GSX 40600S-3D	50.0	I56
		LHHM 6060ZX	60.0	I83
	24.0	GSX 20600C-4D	60.0	I44
		GSX 20600S-4D	60.0	I42
		GSX 40600C-4D	60.0	I62
		GSX 40600S-4D	60.0	I60
	30.0	EHHM 6060ZX	70.0	I86
6.1	12.0	SSM 2061	50.0	I65
	13.0	GSX 20610S-2D	50.0	I33
6.2	12.0	SSM 2062	50.0	I65
	13.0	GSX 20620S-2D	50.0	I33
6.3	12.0	SSM 2063	50.0	I65
	13.0	GSX 20630S-2D	50.0	I33
6.4	12.0	SSM 2064	50.0	I65
	13.0	GSX 20640S-2D	50.0	I33
6.5	10.0	GSX 20650C-1.5D	60.0	I30
		GSX 40650C-1.5D	60.0	I50
	12.0	SSM 2065	50.0	I65
		SSM 4065	50.0	I68
	13.0	GSX 20650C-2D	60.0	I36
		GSX 20650S-2D	60.0	I33
		GSX 40650C-2D	60.0	I54
		GSX 40650S-2D	60.0	I52
	16.0	SSUP 3065ZX	70.0	I140
	20.0	GSX 20650C-3D	70.0	I40
		GSX 20650S-3D	70.0	I38
		GSX 40650C-3D	70.0	I58
		GSX 40650S-3D	70.0	I56
	26.0	GSX 20650C-4D	70.0	I44
		GSX 20650S-4D	70.0	I42
		GSX 40650C-4D	70.0	I62
		GSX 40650S-4D	70.0	I60
6.6	13.2	GSX 20660S-2D	60.0	I33
	15.0	SSM 2066	55.0	I65
6.7	13.4	GSX 20670S-2D	60.0	I33
	15.0	SSM 2067	55.0	I65
6.8	13.6	GSX 20680S-2D	60.0	I33
	15.0	SSM 2068	55.0	I65
6.9	13.8	GSX 20690S-2D	60.0	I33
	15.0	SSM 2069	55.0	I65
7.0	10.5	SSUPR 4070ZX	80.0	I75
	11.0	GSX 20700C-1.5D	60.0	I30
		GSX 30700C-1.5D	60.0	I46
		GSX 40700C-1.5D	60.0	I50
		GSXSLT 30700C-1.5D	60.0	I138
	14.0	GSX 20700C-2D	60.0	I36
		GSX 40700C-2D	60.0	I54
	15.0	SSM 2070	55.0	I65
		SSM 4070	55.0	I68
	16.0	GSRE 4070SF	60.0	I88
		GSX 20700S-2D	60.0	I33
		GSX 30700C-2D	60.0	I48
		GSX 40700S-2D	60.0	I52
		SSUP 3070ZX	70.0	I140
		SSUP 4070ZX	70.0	I74
	18.0	GSV 4070-2.5D	70.0	I70
		GSXVL 4070-2.5D	70.0	I72
	21.0	GSX 20700C-3D	70.0	I40
		GSX 20700S-3D	70.0	I38
		GSX 40700C-3D	70.0	I58
		GSX 40700S-3D	70.0	I56
	28.0	GSX 20700C-4D	80.0	I44
		GSX 20700S-4D	80.0	I42
		GSX 40700C-4D	80.0	I62

Cutting Edge Length List by Diameter

Diameter ø7.0 to ø8.3mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
7.0	28.0	GSX 40700S-4D	80.0	I60
7.1	15.0	SSM 2071	55.0	I65
	16.0	GSX 20710S-2D	60.0	I33
7.2	15.0	SSM 2072	55.0	I65
	16.0	GSX 20720S-2D	60.0	I33
7.3	15.0	SSM 2073	55.0	I65
	16.0	GSX 20730S-2D	60.0	I33
7.4	15.0	SSM 2074	55.0	I65
	16.0	GSX 20740S-2D	60.0	I33
7.5	12.0	GSX 20750C-1.5D	60.0	I30
		GSX 40750C-1.5D	60.0	I50
	15.0	GSX 20750C-2D	60.0	I36
		GSX 40750C-2D	60.0	I54
		SSM 2075	55.0	I65
		SSM 4075	55.0	I68
	16.0	GSX 20750S-2D	60.0	I33
		GSX 40750S-2D	60.0	I52
		SSUP 3075ZX	70.0	I140
	23.0	GSX 20750C-3D	70.0	I40
		GSX 20750S-3D	70.0	I38
		GSX 40750C-3D	70.0	I58
		GSX 40750S-3D	70.0	I56
	30.0	GSX 20750C-4D	80.0	I44
		GSX 20750S-4D	80.0	I42
		GSX 40750C-4D	80.0	I62
		GSX 40750S-4D	80.0	I60
7.6	15.0	SSM 2076	55.0	I65
	16.0	GSX 20760S-2D	60.0	I33
7.7	15.0	SSM 2077	55.0	I65
	16.0	GSX 20770S-2D	60.0	I33
7.8	15.0	SSM 2078	55.0	I65
	16.0	GSX 20780S-2D	60.0	I33
7.9	15.0	SSM 2079	55.0	I65
	16.0	GSX 20790S-2D	60.0	I33
8.0	12.0	GSX 20800C-1.5D	60.0	I30
		GSX 30800C-1.5D	60.0	I46
		GSX 40800C-1.5D	60.0	I50
		GSXSLT 30800C-1.5D	60.0	I138
		SSUPR 4080ZX	80.0	I75
	15.0	SSM 2080	55.0	I65
		SSM 4080	55.0	I68
	16.0	GSX 20800C-2D	60.0	I36
		GSX 40800C-2D	60.0	I54
		HHM 6080ZX	60.0	I80
	18.0	ASM 2080	60.0	I92
		ASM 2080DL	60.0	I90
		ASM 4080DL	60.0	I91
	19.0	GSH 6080SF	60.0	I77
		GSRE 4080SF	60.0	I88
		GSX 20800S-2D	60.0	I33
		GSX 30800C-2D	60.0	I48
		GSX 40800S-2D	60.0	I52
		SSUP 3080ZX	80.0	I140
		SSUP 4080ZX	80.0	I74
	20.0	GSV 4080-2.5D	80.0	I70
		GSXVL 4080-2.5D	80.0	I72
	24.0	GSX 20800C-3D	70.0	I40
		GSX 20800S-3D	70.0	I38
		GSX 40800C-3D	70.0	I58
		GSX 40800S-3D	70.0	I56
	25.0	LHHM 6080ZX	75.0	I83
	32.0	GSX 20800C-4D	80.0	I44
		GSX 20800S-4D	80.0	I42
		GSX 40800C-4D	80.0	I62
		GSX 40800S-4D	80.0	I60
	40.0	EHHM 6080ZX	90.0	I86
8.1	15.0	SSM 2081	55.0	I65
	19.0	GSX 20810S-2D	60.0	I33
8.2	15.0	SSM 2082	55.0	I65
	19.0	GSX 20820S-2D	60.0	I33
8.3	15.0	SSM 2083	55.0	I65
	19.0	GSX 20830S-2D	60.0	I33

Diameter ø8.4 to ø9.5mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
8.4	15.0	SSM 2084	55.0	I65
	19.0	GSX 20840S-2D	60.0	I33
8.5	13.0	GSX 20850C-1.5D	70.0	I30
		GSX 40850C-1.5D	70.0	I50
	15.0	SSM 2085	55.0	I65
		SSM 4085	55.0	I68
	17.0	GSX 20850C-2D	70.0	I36
		GSX 40850C-2D	70.0	I54
	19.0	GSX 20850S-2D	70.0	I33
		GSX 40850S-2D	70.0	I52
		SSUP 3085ZX	90.0	I140
	26.0	GSX 20850C-3D	75.0	I40
		GSX 20850S-3D	75.0	I38
		GSX 40850C-3D	75.0	I58
		GSX 40850S-3D	75.0	I56
	34.0	GSX 20850C-4D	90.0	I44
		GSX 20850S-4D	90.0	I42
		GSX 40850C-4D	90.0	I62
		GSX 40850S-4D	90.0	I60
8.6	15.0	SSM 2086	55.0	I65
	19.0	GSX 20860S-2D	70.0	I33
8.7	15.0	SSM 2087	55.0	I65
	19.0	GSX 20870S-2D	70.0	I33
8.8	15.0	SSM 2088	55.0	I65
	19.0	GSX 20880S-2D	70.0	I33
8.9	15.0	SSM 2089	55.0	I65
	19.0	GSX 20890S-2D	70.0	I34
9.0	13.5	SSUPR 4090ZX	90.0	I75
	14.0	GSX 20900C-1.5D	70.0	I30
		GSX 30900C-1.5D	70.0	I46
		GSX 40900C-1.5D	70.0	I50
		GSXSLT 30900C-1.5D	70.0	I138
	15.0	SSM 2090	55.0	I65
		SSM 4090	55.0	I68
	18.0	GSX 20900C-2D	70.0	I36
		GSX 40900C-2D	70.0	I54
	19.0	GSRE 4090SF	70.0	I88
		GSX 20900S-2D	70.0	I34
		GSX 30900C-2D	70.0	I48
		GSX 40900S-2D	70.0	I52
		SSUP 3090ZX	90.0	I140
		SSUP 4090ZX	90.0	I74
	23.0	GSV 4090-2.5D	90.0	I70
		GSXVL 4090-2.5D	90.0	I72
	27.0	GSX 20900C-3D	75.0	I40
		GSX 20900S-3D	75.0	I38
		GSX 40900C-3D	75.0	I58
		GSX 40900S-3D	75.0	I56
	36.0	GSX 20900C-4D	90.0	I44
		GSX 20900S-4D	90.0	I42
		GSX 40900C-4D	90.0	I62
		GSX 40900S-4D	90.0	I60
9.1	15.0	SSM 2091	55.0	I65
	19.0	GSX 20910S-2D	70.0	I34
9.2	15.0	SSM 2092	55.0	I66
	19.0	GSX 20920S-2D	70.0	I34
9.3	15.0	SSM 2093	55.0	I66
	19.0	GSX 20930S-2D	70.0	I34
9.4	15.0	SSM 2094	55.0	I66
	19.0	GSX 20940S-2D	70.0	I34
9.5	15.0	GSX 20950C-1.5D	70.0	I30
		GSX 40950C-1.5D	70.0	I50
		SSM 2095	55.0	I66
		SSM 4095	55.0	I68
	19.0	GSX 20950C-2D	70.0	I36
		GSX 40950C-2D	70.0	I54
		GSX 40950S-2D	70.0	I52
		SSUP 3095ZX	90.0	I140
	20.0	GSX 20950S-2D	70.0	I34
	29.0	GSX 20950C-3D	75.0	I40
		GSX 20950S-3D	75.0	I38
		GSX 40950C-3D	75.0	I58

Cutting Edge Length List by Diameter

Diameter ø9.5 to ø11.0mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
9.5	29.0	GSX 40950S-3D	75.0	I56
	38.0	GSX 20950C-4D	90.0	I44
		GSX 20950S-4D	90.0	I42
	39.0	GSX 40950C-4D	90.0	I62
		GSX 40950S-4D	90.0	I60
9.6	18.0	SSM 2096	65.0	I66
	20.0	GSX 20960S-2D	70.0	I34
9.7	18.0	SSM 2097	65.0	I66
	20.0	GSX 20970S-2D	70.0	I34
9.8	18.0	SSM 2098	65.0	I66
	20.0	GSX 20980S-2D	70.0	I34
9.9	18.0	SSM 2099	65.0	I66
	20.0	GSX 20990S-2D	70.0	I34
10.0	15.0	GSX 21000C-1.5D	70.0	I30
		GSX 31000C-1.5D	70.0	I46
		GSX 41000C-1.5D	70.0	I50
		GSXSLT 31000C-1.5D	70.0	I138
		SSUPR 4100ZX	100.0	I75
	18.0	SSM 2100	65.0	I66
		SSM 4100	65.0	I68
	20.0	GSX 21000C-2D	70.0	I36
		GSX 41000C-2D	70.0	I54
		HHM 6100ZX	71.0	I80
	22.0	ASM 2100	71.0	I92
		ASM 2100DL	71.0	I90
		ASM 4100DL	71.0	I91
		GSH 6100SF	70.0	I77
		GSRE 4100SF	70.0	I88
		GSX 21000S-2D	70.0	I34
		GSX 31000C-2D	70.0	I48
		GSX 41000S-2D	70.0	I52
		SSUP 3100ZX	90.0	I140
		SSUP 4100ZX	90.0	I74
	25.0	GSV 4100-2.5D	90.0	I70
		GSXVL 4100-2.5D	90.0	I72
	30.0	GSX 21000C-3D	90.0	I40
		GSX 21000S-3D	90.0	I38
		GSX 41000C-3D	90.0	I58
		GSX 41000S-3D	90.0	I56
		LHHM 6100ZX	80.0	I83
	40.0	GSX 21000C-4D	90.0	I44
		GSX 21000S-4D	90.0	I42
		GSX 41000C-4D	90.0	I62
		GSX 41000S-4D	90.0	I60
	50.0	EHHM 6100ZX	100.0	I86
10.5	16.0	GSX 21050C-1.5D	75.0	I30
		GSX 41050C-1.5D	75.0	I50
	18.0	SSM 2105	70.0	I66
	21.0	GSX 21050C-2D	75.0	I36
		GSX 41050C-2D	75.0	I54
	22.0	GSX 21050S-2D	75.0	I34
		GSX 41050S-2D	75.0	I52
	32.0	GSX 21050C-3D	90.0	I40
		GSX 21050S-3D	90.0	I38
		GSX 41050C-3D	90.0	I58
		GSX 41050S-3D	90.0	I56
	42.0	GSX 21050C-4D	100.0	I44
		GSX 21050S-4D	100.0	I42
		GSX 41050C-4D	100.0	I62
		GSX 41050S-4D	100.0	I60
11.0	16.5	SSUPR 4110ZX	120.0	I75
	17.0	GSX 21100C-1.5D	75.0	I30
		GSX 41100C-1.5D	75.0	I50
	18.0	SSM 2110	70.0	I66
		SSM 4110	70.0	I68
	22.0	GSRE 4110SF	75.0	I88
		GSX 21100C-2D	75.0	I36
		GSX 21100S-2D	75.0	I34
		GSX 41100C-2D	75.0	I54
		GSX 41100S-2D	75.0	I52
		SSUP 3110ZX	90.0	I140
		SSUP 4110ZX	90.0	I74

Diameter ø11.0 to ø13.0mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
11.0	28.0	GSV 4110-2.5D	90.0	I70
		GSXVL 4110-2.5D	90.0	I72
	33.0	GSX 21100C-3D	90.0	I40
		GSX 21100S-3D	90.0	I38
		GSX 41100C-3D	90.0	I58
		GSX 41100S-3D	90.0	I56
	44.0	GSX 21100C-4D	100.0	I44
		GSX 21100S-4D	100.0	I42
		GSX 41100C-4D	100.0	I62
		GSX 41100S-4D	100.0	I60
11.5	18.0	GSX 21150C-1.5D	75.0	I30
		GSX 41150C-1.5D	75.0	I50
		SSM 2115	70.0	I66
	23.0	GSX 21150C-2D	75.0	I36
		GSX 21150S-2D	75.0	I34
		GSX 41150C-2D	75.0	I54
		GSX 41150S-2D	75.0	I52
	35.0	GSX 21150C-3D	90.0	I40
		GSX 21150S-3D	90.0	I38
		GSX 41150C-3D	90.0	I58
		GSX 41150S-3D	90.0	I56
	46.0	GSX 21150C-4D	100.0	I44
		GSX 21150S-4D	100.0	I42
		GSX 41150C-4D	100.0	I62
		GSX 41150S-4D	100.0	I60
12.0	18.0	GSX 21200C-1.5D	75.0	I30
		GSX 31200C-1.5D	75.0	I46
		GSX 41200C-1.5D	75.0	I50
		GSXSLT 31200C-1.5D	75.0	I138
		SSM 2120	70.0	I66
		SSM 4120	70.0	I68
		SSUPR 4120ZX	120.0	I75
	24.0	GSX 21200C-2D	75.0	I36
		GSX 41200C-2D	75.0	I54
		HHM 6120ZX	75.0	I80
	25.0	ASM 2120	75.0	I92
		ASM 2120DL	75.0	I90
		ASM 4120DL	75.0	I91
	26.0	GSH 6120SF	75.0	I77
		GSRE 4120SF	75.0	I88
		GSX 21200S-2D	75.0	I34
		GSX 31200C-2D	75.0	I48
		GSX 41200S-2D	75.0	I52
		SSUP 3120ZX	90.0	I140
		SSUP 4120ZX	90.0	I74
	30.0	GSV 4120-2.5D	90.0	I70
		GSXVL 4120-2.5D	90.0	I72
		LHHM 6120ZX	100.0	I83
	36.0	GSX 21200C-3D	90.0	I40
		GSX 21200S-3D	90.0	I38
		GSX 41200C-3D	90.0	I58
		GSX 41200S-3D	90.0	I56
	48.0	GSX 21200C-4D	100.0	I44
		GSX 21200S-4D	100.0	I42
		GSX 41200C-4D	100.0	I62
		GSX 41200S-4D	100.0	I60
	50.0	EHHM 6120ZX	120.0	I86
12.5	20.0	SSM 2125	80.0	I66
	26.0	GSX 21250S-2D	75.0	I34
13.0	19.5	SSUPR 4130ZX	130.0	I75
	20.0	GSX 21300C-1.5D	90.0	I30
		GSX 41300C-1.5D	90.0	I50
		SSM 2130	80.0	I66
		SSM 4130	80.0	I68
	26.0	GSX 21300C-2D	90.0	I36
		GSX 21300S-2D	90.0	I34
		GSX 41300C-2D	90.0	I54
		GSX 41300S-2D	90.0	I52
		SSUP 3130ZX	100.0	I140
	39.0	GSX 21300C-3D	100.0	I40
		GSX 21300S-3D	100.0	I38
		GSX 41300C-3D	100.0	I58

Cutting Edge Length List by Diameter

Diameter ø13.0 to ø16.0mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
13.0	39.0	GSX 41300S-3D	100.0	I56
	52.0	GSX 21300C-4D	110.0	I44
		GSX 21300S-4D	110.0	I42
		GSX 41300C-4D	110.0	I62
		GSX 41300S-4D	110.0	I60
13.5	20.0	SSM 2135	80.0	I66
	27.0	GSX 41350S-2D	90.0	I52
14.0	20.0	SSM 2140	80.0	I66
		SSM 4140	80.0	I68
	21.0	GSX 21400C-1.5D	90.0	I30
		GSX 41400C-1.5D	90.0	I50
	26.0	GSRE 4140SF	90.0	I88
		SSUP 3140ZX	110.0	I140
		SSUP 4140ZX	110.0	I74
	28.0	GSX 21400C-2D	90.0	I36
		GSX 21400S-2D	90.0	I34
		GSX 41400C-2D	90.0	I54
		GSX 41400S-2D	90.0	I52
	32.0	ASM 2140	90.0	I92
	35.0	GSV 4140-2.5D	110.0	I70
		GSXVL 4140-2.5D	110.0	I72
	42.0	GSX 21400C-3D	110.0	I40
		GSX 21400S-3D	110.0	I38
		GSX 41400C-3D	110.0	I58
		GSX 41400S-3D	110.0	I56
	56.0	GSX 21400C-4D	110.0	I44
		GSX 21400S-4D	110.0	I42
		GSX 41400C-4D	110.0	I62
		GSX 41400S-4D	110.0	I60
14.5	25.0	SSM 2145	80.0	I66
15.0	23.0	GSX 21500C-1.5D	90.0	I30
		GSX 41500C-1.5D	90.0	I50
	25.0	SSM 2150	80.0	I66
		SSM 4150	80.0	I68
	26.0	SSUP 3150ZX	110.0	I140
		SSUP 4150ZX	110.0	I74
	30.0	GSX 21500C-2D	90.0	I36
		GSX 21500S-2D	90.0	I34
		GSX 41500C-2D	90.0	I54
		GSX 41500S-2D	90.0	I52
	32.0	ASM 2150	90.0	I92
	38.0	GSV 4150-2.5D	110.0	I70
		GSXVL 4150-2.5D	110.0	I72
	45.0	GSX 21500C-3D	110.0	I40
		GSX 21500S-3D	110.0	I38
		GSX 41500C-3D	110.0	I58
		GSX 41500S-3D	110.0	I56
	60.0	GSX 21500C-4D	120.0	I44
		GSX 21500S-4D	120.0	I42
		GSX 41500C-4D	120.0	I62
		GSX 41500S-4D	120.0	I60
15.5	35.0	SSM 2155	90.0	I66
16.0	24.0	GSX 21600C-1.5D	90.0	I30
		GSX 41600C-1.5D	90.0	I50
		SSUPR 4160ZX	160.0	I75
	32.0	ASM 2160	90.0	I92
		ASM 2160DL	90.0	I90
		ASM 4160DL	90.0	I91
		GSH 8160SF	90.0	I78
		GSRE 4160SF	90.0	I88
		GSX 21600C-2D	90.0	I36
		GSX 21600S-2D	90.0	I34
		GSX 41600C-2D	90.0	I54
		GSX 41600S-2D	90.0	I52
		HHM 8160ZX	90.0	I81
		SSUP 3160ZX	115.0	I140
		SSUP 4160ZX	115.0	I74
	35.0	SSM 2160	90.0	I66
		SSM 4160	90.0	I68
	40.0	GSV 4160-2.5D	115.0	I70
		GSXVL 4160-2.5D	115.0	I72

Diameter ø16.0 to ø20.0mm

Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
16.0	48.0	GSX 21600C-3D	110.0	I40
		GSX 21600S-3D	110.0	I38
		GSX 41600C-3D	110.0	I58
		GSX 41600S-3D	110.0	I56
	50.0	LHHM 8160ZX	105.0	I84
	64.0	GSX 21600C-4D	120.0	I44
		GSX 21600S-4D	120.0	I42
		GSX 41600C-4D	120.0	I62
		GSX 41600S-4D	120.0	I60
	70.0	EHHM 8160ZX	140.0	I87
16.5	35.0	SSM 2165	90.0	I66
17.0	25.5	SSUPR 4170ZX	170.0	I75
	26.0	GSX 21700C-1.5D	100.0	I30
		GSX 41700C-1.5D	100.0	I50
	34.0	GSX 21700C-2D	100.0	I36
		GSX 41700C-2D	100.0	I54
	35.0	GSX 21700S-2D	100.0	I34
		GSX 41700S-2D	100.0	I52
		SSM 2170	90.0	I66
	51.0	GSX 21700C-3D	110.0	I40
		GSX 21700S-3D	110.0	I38
		GSX 41700C-3D	110.0	I58
		GSX 41700S-3D	110.0	I56
	68.0	GSX 21700C-4D	130.0	I44
		GSX 21700S-4D	130.0	I42
		GSX 41700C-4D	130.0	I62
		GSX 41700S-4D	130.0	I60
17.5	40.0	SSM 2175	105.0	I66
18.0	27.0	GSX 21800C-1.5D	100.0	I30
		GSX 41800C-1.5D	100.0	I50
	32.0	GSRE 4180SF	100.0	I88
		SSUP 4180ZX	120.0	I74
	36.0	GSX 21800C-2D	100.0	I36
		GSX 41800C-2D	100.0	I54
	40.0	GSX 21800S-2D	100.0	I34
		GSX 41800S-2D	100.0	I52
		SSM 2180	105.0	I66
		SSM 4180	105.0	I68
	45.0	GSV 4180-2.5D	120.0	I70
		GSXVL 4180-2.5D	120.0	I72
	54.0	GSX 21800C-3D	120.0	I40
		GSX 21800S-3D	120.0	I38
		GSX 41800C-3D	120.0	I58
		GSX 41800S-3D	120.0	I56
	72.0	GSX 21800C-4D	130.0	I44
		GSX 21800S-4D	130.0	I42
		GSX 41800C-4D	130.0	I62
		GSX 41800S-4D	130.0	I60
18.5	40.0	SSM 2185	105.0	I66
19.0	29.0	GSX 21900C-1.5D	100.0	I30
		GSX 41900C-1.5D	100.0	I50
	38.0	GSX 21900C-2D	100.0	I36
		GSX 41900C-2D	100.0	I54
	40.0	GSX 21900S-2D	100.0	I34
		GSX 41900S-2D	100.0	I52
		SSM 2190	105.0	I66
	57.0	GSX 21900C-3D	120.0	I40
		GSX 21900S-3D	120.0	I38
		GSX 41900C-3D	120.0	I58
		GSX 41900S-3D	120.0	I56
	76.0	GSX 21900C-4D	140.0	I44
		GSX 21900S-4D	140.0	I42
		GSX 41900C-4D	140.0	I62
		GSX 41900S-4D	140.0	I60
19.5	40.0	SSM 2195	105.0	I66
20.0	30.0	GSX 22000C-1.5D	100.0	I30
		GSX 42000C-1.5D	100.0	I50
		SSUPR 4200ZX	200.0	I75
	38.0	GSH 8200SF	100.0	I78
		GSRE 4200SF	100.0	I88
		SSUP 4200ZX	125.0	I74

Cutting Edge Length List by Diameter

Diameter ø20.0 to ø32.0mm — Square

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
20.0	40.0	GSX 22000C-2D	100.0	I36
		GSX 22000S-2D	100.0	I34
		GSX 42000C-2D	100.0	I54
		GSX 42000S-2D	100.0	I52
		HHM 8200ZX	106.0	I81
		SSM 2200	105.0	I66
		SSM 4200	105.0	I68
	50.0	GSV 4200-2.5D	125.0	I70
		GSXVL 4200-2.5D	125.0	I72
	55.0	LHHM 8200ZX	120.0	I84
	60.0	GSX 22000C-3D	120.0	I40
		GSX 22000S-3D	120.0	I38
		GSX 42000C-3D	120.0	I58
		GSX 42000S-3D	120.0	I56
	80.0	GSX 22000C-4D	140.0	I44
		GSX 22000S-4D	140.0	I42
		GSX 42000C-4D	140.0	I62
		GSX 42000S-4D	140.0	I60
	85.0	EHHM 8200ZX	165.0	I87
21.0	40.0	SSM 2210	105.0	I66
	42.0	GSX 22100S-2D	110.0	I34
22.0	40.0	SSM 2220	105.0	I66
	44.0	GSX 22200S-2D	110.0	I34
		GSX 42200S-2D	110.0	I52
	66.0	GSX 42200S-3D	130.0	I56
23.0	45.0	SSM 2230	115.0	I66
	46.0	GSX 22300S-2D	120.0	I34
24.0	45.0	SSM 2240	115.0	I66
	48.0	GSX 22400S-2D	120.0	I34
		GSX 42400S-2D	120.0	I52
	72.0	GSX 22400S-3D	130.0	I38
25.0	38.0	GSX 22500C-1.5D	120.0	I30
		GSX 42500C-1.5D	120.0	I50
	50.0	GSX 22500C-2D	120.0	I36
		GSX 22500S-2D	120.0	I34
		GSX 42500C-2D	120.0	I54
		GSX 42500S-2D	120.0	I52
		SSM 2250	120.0	I66
		SSM 4250	120.0	I68
	63.0	GSV 4250-2.5D	140.0	I70
		GSXVL 4250-2.5D	140.0	I72
	65.0	LHHM 8250ZX	140.0	I84
	75.0	GSX 22500C-3D	130.0	I40
		GSX 22500S-3D	130.0	I38
		GSX 42500C-3D	130.0	I58
		GSX 42500S-3D	130.0	I56
	100.0	EHHM 8250ZX	185.0	I87
		GSX 22500C-4D	160.0	I44
		GSX 22500S-4D	160.0	I42
		GSX 42500C-4D	160.0	I62
		GSX 42500S-4D	160.0	I60
30.0	55.0	SSM 2300	130.0	I66
	75.0	LHHM 8300ZX	160.0	I84
	110.0	EHHM 8300ZX	205.0	I87
32.0	64.0	HHM 8320ZX	130.0	I81
	85.0	LHHM 8320ZX	170.0	I84
	110.0	EHHM 8320ZX	205.0	I87

Diameter ø3.0mm — Radius

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
3.0	4.5	SSUPR 4030ZX-R02	60.0	I114
		SSUPR 4030ZX-R05	60.0	I114
	8.0	GSV 4030-R02-2.5D	50.0	I100
		GSV 4030-R05-2.5D	50.0	I100
		GSX 40300-R02-2D	45.0	I98
		GSX 40300-R05-2D	45.0	I98
		GSXVL 4030-R02-2.5D	50.0	I102
		GSXVL 4030-R05-2.5D	50.0	I102
		SSUP 4030ZX-R02	50.0	I112
		SSUP 4030ZX-R05	50.0	I112

Diameter ø4.0 to ø8.0mm — Radius

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
4.0	6.0	SSUPR 4040ZX-R02	60.0	I114
		SSUPR 4040ZX-R05	60.0	I114
	10.0	GSV 4040-R02-2.5D	50.0	I100
		GSV 4040-R05-2.5D	50.0	I100
		GSV 4040-R10-2.5D	50.0	I100
		GSXVL 4040-R02-2.5D	50.0	I102
		GSXVL 4040-R05-2.5D	50.0	I102
		GSXVL 4040-R10-2.5D	50.0	I102
	11.0	GSX 40400-R02-2D	45.0	I98
		GSX 40400-R05-2D	45.0	I98
		GSX 40400-R10-2D	45.0	I98
		SSUP 4040ZX-R02	50.0	I112
		SSUP 4040ZX-R05	50.0	I112
		SSUP 4040ZX-R10	50.0	I112
4.5	12.0	SSEH 4045-R05	50.0	I119
		SSEH 4045W-R05	50.0	I108
		SSEHVL 4045-R05	50.0	I118
		SSEHVL 4045-R10	50.0	I118
		SSEHVL 4045W-R05	50.0	I104
		SSEHVL 4045W-R10	50.0	I104
5.0	7.5	SSUPR 4050ZX-R02	60.0	I114
		SSUPR 4050ZX-R05	60.0	I114
	13.0	GSV 4050-R02-2.5D	60.0	I100
		GSV 4050-R05-2.5D	60.0	I100
		GSV 4050-R10-2.5D	60.0	I100
		GSX 40500-R02-2D	50.0	I98
		GSX 40500-R05-2D	50.0	I98
		GSX 40500-R10-2D	50.0	I98
		GSXVL 4050-R02-2.5D	60.0	I102
		GSXVL 4050-R05-2.5D	60.0	I102
		GSXVL 4050-R10-2.5D	60.0	I102
		SSEH 4050-R05	60.0	I119
		SSEH 4050W-R05	60.0	I108
		SSEHVL 4050-R05	60.0	I118
		SSEHVL 4050-R10	60.0	I118
		SSEHVL 4050W-R05	60.0	I104
		SSEHVL 4050W-R10	60.0	I104
		SSUP 4050ZX-R02	60.0	I112
		SSUP 4050ZX-R05	60.0	I112
		SSUP 4050ZX-R10	60.0	I112
6.0	9.0	SSUPR 4060ZX-R03	60.0	I114
		SSUPR 4060ZX-R05	60.0	I114
	13.0	GSH 6060SF-R02	50.0	I116
		GSH 6060SF-R05	50.0	I116
		GSH 6060SF-R10	50.0	I116
		GSX 40600-R02-2D	50.0	I98
		GSX 40600-R05-2D	50.0	I98
		GSX 40600-R10-2D	50.0	I98
		GSX 40600-R15-2D	50.0	I98
		SSEH 4060-R10	60.0	I119
		SSEH 4060W-R10	60.0	I108
		SSEHVL 4060-R10	60.0	I118
		SSEHVL 4060W-R10	60.0	I104
		SSUP 4060ZX-R03	60.0	I112
		SSUP 4060ZX-R05	60.0	I112
		SSUP 4060ZX-R10	60.0	I112
		SSUP 4060ZX-R15	60.0	I112
	15.0	GSV 4060-R03-2.5D	60.0	I100
		GSV 4060-R05-2.5D	60.0	I100
		GSV 4060-R10-2.5D	60.0	I100
		GSV 4060-R15-2.5D	60.0	I100
		GSXVL 4060-R03-2.5D	60.0	I102
		GSXVL 4060-R05-2.5D	60.0	I102
		GSXVL 4060-R10-2.5D	60.0	I102
		GSXVL 4060-R15-2.5D	60.0	I102
7.0	10.5	SSUPR 4070ZX-R03	80.0	I114
		SSUPR 4070ZX-R05	80.0	I114
8.0	12.0	SSUPR 4080ZX-R05	80.0	I114
		SSUPR 4080ZX-R10	80.0	I114

Cutting Edge Length List by Diameter

Diameter: ø8.0 to 12.0mm

Radius

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
8.0	19.0	GSH 6080SF-R02	60.0	I116
		GSH 6080SF-R05	60.0	I116
		GSH 6080SF-R10	60.0	I116
		GSX 40800-R02-2D	60.0	I98
		GSX 40800-R05-2D	60.0	I98
		GSX 40800-R10-2D	60.0	I98
		GSX 40800-R15-2D	60.0	I98
		SSEH 4080-R10	80.0	I119
		SSEH 4080W-R10	80.0	I108
		SSEHVL 4080-R10	80.0	I118
		SSEHVL 4080W-R10	80.0	I104
		SSUP 4080ZX-R03	80.0	I112
		SSUP 4080ZX-R05	80.0	I112
		SSUP 4080ZX-R10	80.0	I112
		SSUP 4080ZX-R15	80.0	I112
		SSUP 4080ZX-R20	80.0	I112
	20.0	GSV 4080-R03-2.5D	80.0	I100
		GSV 4080-R05-2.5D	80.0	I100
		GSV 4080-R10-2.5D	80.0	I100
		GSV 4080-R15-2.5D	80.0	I100
		GSV 4080-R20-2.5D	80.0	I100
		GSXVL 4080-R03-2.5D	80.0	I102
		GSXVL 4080-R05-2.5D	80.0	I102
		GSXVL 4080-R10-2.5D	80.0	I102
		GSXVL 4080-R15-2.5D	80.0	I102
		GSXVL 4080-R20-2.5D	80.0	I102
9.0	13.5	SSUPR 4090ZX-R05	90.0	I114
		SSUPR 4090ZX-R10	90.0	I114
10.0	15.0	SSUPR 4100ZX-R05	100.0	I114
		SSUPR 4100ZX-R10	100.0	I114
		SSUPR 4100ZX-R15	100.0	I114
	22.0	GSH 6100SF-R05	70.0	I116
		GSH 6100SF-R10	70.0	I116
		GSH 6100SF-R15	70.0	I116
		GSH 6100SF-R20	70.0	I116
		GSX 41000-R02-2D	70.0	I98
		GSX 41000-R05-2D	70.0	I98
		GSX 41000-R10-2D	70.0	I98
		GSX 41000-R15-2D	70.0	I98
		GSX 41000-R20-2D	70.0	I98
		SSEH 4100-R10	90.0	I119
		SSEH 4100-R30	90.0	I119
		SSEH 4100W-R10	90.0	I108
		SSEH 4100W-R30	90.0	I108
		SSEHVL 4100-R10	90.0	I118
		SSEHVL 4100-R30	90.0	I118
		SSEHVL 4100W-R10	90.0	I104
		SSEHVL 4100W-R30	90.0	I104
		SSUP 4100ZX-R03	90.0	I112
		SSUP 4100ZX-R05	90.0	I112
		SSUP 4100ZX-R10	90.0	I112
		SSUP 4100ZX-R15	90.0	I112
		SSUP 4100ZX-R20	90.0	I112
	25.0	GSV 4100-R03-2.5D	90.0	I100
		GSV 4100-R05-2.5D	90.0	I100
		GSV 4100-R10-2.5D	90.0	I100
		GSV 4100-R15-2.5D	90.0	I100
		GSV 4100-R20-2.5D	90.0	I100
		GSXVL 4100-R03-2.5D	90.0	I102
		GSXVL 4100-R05-2.5D	90.0	I102
		GSXVL 4100-R10-2.5D	90.0	I102
		GSXVL 4100-R15-2.5D	90.0	I102
		GSXVL 4100-R20-2.5D	90.0	I102
11.0	16.5	SSUPR 4110ZX-R05	120.0	I114
		SSUPR 4110ZX-R10	120.0	I114
		SSUPR 4110ZX-R15	120.0	I114
12.0	18.0	SSUPR 4120ZX-R05	120.0	I114
		SSUPR 4120ZX-R10	120.0	I114
		SSUPR 4120ZX-R15	120.0	I114
	26.0	GSH 6120SF-R05	75.0	I116
		GSH 6120SF-R10	75.0	I116
		GSH 6120SF-R15	75.0	I116

Diameter ø12.0 to ø20.0mm

Radius

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
12.0	26.0	GSH 6120SF-R20	75.0	I116
		GSX 41200-R02-2D	75.0	I98
		GSX 41200-R05-2D	75.0	I98
		GSX 41200-R10-2D	75.0	I98
		GSX 41200-R15-2D	75.0	I98
		GSX 41200-R20-2D	75.0	I98
		SSEH 4120-R10	90.0	I119
		SSEH 4120-R30	90.0	I119
		SSEH 4120W-R10	90.0	I108
		SSEH 4120W-R30	90.0	I108
		SSEH 4120WS-R10	90.0	I110
		SSEH 4120WS-R30	90.0	I110
		SSEHVL 4120-R10	90.0	I118
		SSEHVL 4120-R30	90.0	I118
		SSEHVL 4120W-R10	90.0	I104
		SSEHVL 4120W-R30	90.0	I104
		SSEHVL 4120WS-R10	90.0	I106
		SSEHVL 4120WS-R30	90.0	I106
		SSUP 4120ZX-R05	90.0	I112
		SSUP 4120ZX-R10	90.0	I112
		SSUP 4120ZX-R15	90.0	I112
		SSUP 4120ZX-R20	90.0	I112
		SSUP 4120ZX-R30	90.0	I112
	30.0	GSV 4120-R05-2.5D	90.0	I100
		GSV 4120-R10-2.5D	90.0	I100
		GSV 4120-R15-2.5D	90.0	I100
		GSV 4120-R20-2.5D	90.0	I100
		GSV 4120-R30-2.5D	90.0	I100
		GSXVL 4120-R05-2.5D	90.0	I102
		GSXVL 4120-R10-2.5D	90.0	I102
		GSXVL 4120-R15-2.5D	90.0	I102
		GSXVL 4120-R20-2.5D	90.0	I102
		GSXVL 4120-R30-2.5D	90.0	I102
13.0	19.5	SSUPR 4130ZX-R05	130.0	I114
		SSUPR 4130ZX-R10	130.0	I114
		SSUPR 4130ZX-R15	130.0	I114
16.0	24.0	SSUPR 4160ZX-R10	160.0	I114
		SSUPR 4160ZX-R15	160.0	I114
		SSUPR 4160ZX-R20	160.0	I114
	32.0	GSH 8160SF-R10	90.0	I117
		GSH 8160SF-R15	90.0	I117
		GSH 8160SF-R20	90.0	I117
		SSEH 4160-R10	115.0	I119
		SSEH 4160-R30	115.0	I119
		SSEH 4160W-R10	115.0	I108
		SSEH 4160W-R30	115.0	I108
		SSEH 4160WS-R10	115.0	I110
		SSEH 4160WS-R30	115.0	I110
		SSEHVL 4160-R10	115.0	I118
		SSEHVL 4160-R30	115.0	I118
		SSEHVL 4160W-R10	115.0	I104
		SSEHVL 4160W-R30	115.0	I104
		SSEHVL 4160WS-R10	115.0	I106
		SSEHVL 4160WS-R30	115.0	I106
		SSUP 4160ZX-R10	115.0	I112
		SSUP 4160ZX-R15	115.0	I112
		SSUP 4160ZX-R20	115.0	I112
		SSUP 4160ZX-R30	115.0	I112
	40.0	GSV 4160-R10-2.5D	115.0	I100
		GSV 4160-R15-2.5D	115.0	I100
		GSV 4160-R20-2.5D	115.0	I100
		GSV 4160-R30-2.5D	115.0	I100
		GSXVL 4160-R10-2.5D	115.0	I102
		GSXVL 4160-R15-2.5D	115.0	I102
		GSXVL 4160-R20-2.5D	115.0	I102
		GSXVL 4160-R30-2.5D	115.0	I102
17.0	25.5	SSUPR 4170ZX-R10	170.0	I114
		SSUPR 4170ZX-R15	170.0	I114
		SSUPR 4170ZX-R20	170.0	I114
20.0	30.0	SSUPR 4200ZX-R10	200.0	I114
		SSUPR 4200ZX-R15	200.0	I114
		SSUPR 4200ZX-R20	200.0	I114

Cutting Edge Length List by Diameter

Diameter ø20.0 to ø25.0mm

Radius

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
20.0	38.0	GSH 8200SF-R10	100.0	I117
		GSH 8200SF-R15	100.0	I117
		GSH 8200SF-R20	100.0	I117
		SSUP 4200ZX-R10	125.0	I112
		SSUP 4200ZX-R15	125.0	I112
		SSUP 4200ZX-R20	125.0	I112
		SSUP 4200ZX-R30	125.0	I112
	40.0	SSEH 4200W-R10	125.0	I108
		SSEH 4200W-R30	125.0	I108
		SSEH 4200WS-R10	125.0	I110
		SSEH 4200WS-R30	125.0	I110
		SSEHVL 4200W-R10	125.0	I104
		SSEHVL 4200W-R30	125.0	I104
		SSEHVL 4200WS-R10	125.0	I106
		SSEHVL 4200WS-R30	125.0	I106
	50.0	GSV 4200-R10-2.5D	125.0	I100
		GSV 4200-R15-2.5D	125.0	I100
		GSV 4200-R20-2.5D	125.0	I100
		GSV 4200-R30-2.5D	125.0	I100
		GSXVL 4200-R10-2.5D	125.0	I102
		GSXVL 4200-R15-2.5D	125.0	I102
		GSXVL 4200-R20-2.5D	125.0	I102
		GSXVL 4200-R30-2.5D	125.0	I102
25.0	50.0	SSEH 4250W-R10	140.0	I108
		SSEH 4250W-R30	140.0	I108
		SSEH 4250WS-R10	140.0	I110
		SSEH 4250WS-R30	140.0	I110
		SSEHVL 4250W-R10	140.0	I104
		SSEHVL 4250W-R30	140.0	I104
		SSEHVL 4250WS-R10	140.0	I106
		SSEHVL 4250WS-R30	140.0	I106
	63.0	GSV 4250-R10-2.5D	140.0	I100
		GSV 4250-R15-2.5D	140.0	I100
		GSV 4250-R20-2.5D	140.0	I100
		GSV 4250-R30-2.5D	140.0	I100
		GSXVL 4250-R10-2.5D	140.0	I102
		GSXVL 4250-R15-2.5D	140.0	I102
		GSXVL 4250-R20-2.5D	140.0	I102
		GSXVL 4250-R30-2.5D	140.0	I102

Diameter ø0.1 to ø1.0mm

Ballnose

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
0.1	0.1	SNB2 0005 0034DL	45.0	I128
		SNB2 0005 0064DL	45.0	I128
0.2	0.2	SNB2 0010 0054DL	45.0	I128
		SNB2 0010 0104DL	45.0	I128
		SNB2 0010 0204DL	45.0	I128
0.3	0.3	SNB2 0015 0054DL	45.0	I128
		SNB2 0015 0104DL	45.0	I128
		SNB2 0015 0204DL	45.0	I128
		SNB2 0015 0304DL	45.0	I128
0.4	0.4	GSBH 20020SF	50.0	I126
		SNB2 0020 0104DL	45.0	I128
		SNB2 0020 0204DL	45.0	I128
		SNB2 0020 0304DL	45.0	I128
		SNB2 0020 0404DL	45.0	I128
	0.6	GSXB 20020	50.0	I124
0.5	0.45	SNB2 0025 0104DL	45.0	I128
		SNB2 0025 0204DL	45.0	I128
		SNB2 0025 0304DL	45.0	I128
		SNB2 0025 0404DL	45.0	I128
0.6	0.6	GSBH 20030SF	50.0	I126
		SNB2 0030 0204DL	45.0	I128
		SNB2 0030 0304DL	45.0	I128
		SNB2 0030 0404DL	45.0	I128
		SNB2 0030 0504DL	45.0	I128
		SNB2 0030 0604DL	45.0	I128
	0.9	GSXB 20030	50.0	I124
1.0	1.0	GSBH 20050SF	50.0	I126
	1.5	GSXB 20050	50.0	I124
		SNB2 0050 0304DL	45.0	I128

Diameter ø1.0 to ø20.0mm

Ballnose

Dia. DC	Cutting Edge Length APMX	Cat. No.	Overall Length LF	Page
1.0	1.5	SNB2 0050 0404DL	45.0	I128
		SNB2 0050 0604DL	45.0	I128
		SNB2 0050 0804DL	50.0	I128
		SNB2 0050 1004DL	50.0	I128
1.5	1.5	GSBH 20075SF	50.0	I126
	2.3	SNB2 0075 0304DL	45.0	I128
		SNB2 0075 0604DL	45.0	I128
		SNB2 0075 1004DL	50.0	I128
	2.5	GSXB 20075	50.0	I124
2.0	2.0	GSBH 20100SF	60.0	I126
	3.0	GSXB 20100	60.0	I124
		SNB 2020DL	60.0	I127
		SNB2 0100 0304DL	50.0	I128
		SNB2 0100 0604DL	50.0	I128
		SNB2 0100 1004DL	50.0	I128
		SNB2 0100 1504DL	60.0	I128
		SNB2 0100 2004DL	60.0	I128
2.5	2.5	GSBH 20125SF	60.0	I126
	4.0	GSXB 20125	60.0	I124
3.0	3.0	GSBH 20150SF	60.0	I126
	4.5	GSXB 20150	60.0	I124
		SNB 2030DL	80.0	I127
4.0	4.0	GSBH 20200SF	70.0	I126
	6.0	GSXB 20200	70.0	I124
		SNB 2040DL	80.0	I127
		SNB2 0200 1606DL	80.0	I128
		SNB2 0200 2006DL	80.0	I128
		SNB2 0200 3006DL	80.0	I128
5.0	5.0	GSBH 20250SF	80.0	I126
	7.5	GSXB 20250	80.0	I124
		SNB 2050DL	90.0	I127
6.0	6.0	GSBH 20300SF	80.0	I126
	9.0	GSXB 20300	80.0	I124
		SNB 2060DL	100.0	I127
7.0	11.0	GSXB 20350	90.0	I124
8.0	8.0	GSBH 20400SF	90.0	I126
	12.0	GSXB 20400	90.0	I124
		SNB 2080DL	100.0	I127
10.0	10.0	GSBH 20500SF	100.0	I126
	15.0	GSXB 20500	100.0	I124
		SNB 2100DL	120.0	I127
12.0	12.0	GSBH 20600SF	110.0	I126
	18.0	GSXB 20600	110.0	I124
		SNB 2120DL	120.0	I127
14.0	21.0	GSXB 20700	110.0	I124
16.0	24.0	GSXB 20800	140.0	I124
		SNB 2160DL	160.0	I127
18.0	27.0	GSXB 20900	140.0	I124
20.0	30.0	GSXB 21000	160.0	I124

Endmill Coating

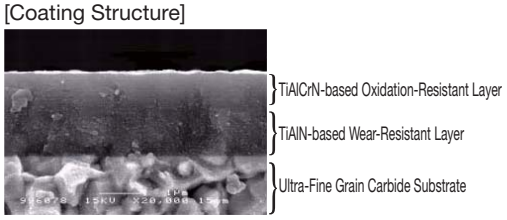
■ Endmill Coating

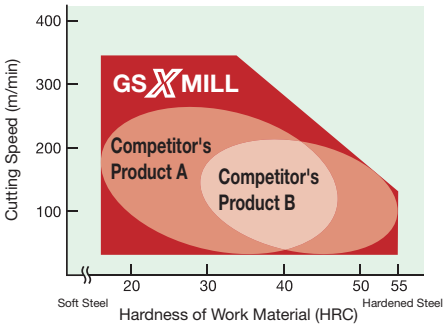
Coating Name	GSX Coat	GS Hard Coat	ZX Coat	AURORA Coat	SUMIDIA Coat
Coating type	TiAlCrN	TiAlCrSiCN	TiAlN	DLC	Diamond
Wear Resistance	◎	◎	○	○	◎
Adhesion Resistance	◎	◎	○	◎	△
Thermal Resistance	◎	◎	○	△	○
Coating Thickness	up to 2μm	up to 2μm	up to 2μm	up to 0.5μm	up to 15μm
Feature	Excellent thermal resistance and adhesion resistance	Excellent hardness, thermal resistance and adhesion resistance	General-purpose	Low coefficient of friction and excellent adhesion resistance	Excellent hardness and wear resistance
Main Application	For general steel and stainless steel milling	For general steel and high-hardness steel milling	For general steel and cast iron milling	For aluminum alloy and copper alloy milling	For CFRP milling
Main Applicable Products	GSX/GSXB/GSXVL series	GSH/GSBH/SSEH/SSEHVL series	UPMILL/HHM series	ASM/SNB/SNB2 series	SSDC series

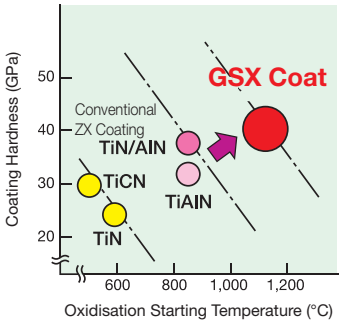
● GSX Coat

- Micro-grain carbide substrate provides high transverse rupture strength and excellent thermal shock resistance, improving reliability in wet cutting applications.
- Adopts GSX Coat for better wear resistance and thermal resistance, improving reliability and tool life when machining a wide range of work materials.

[Coating Structure]

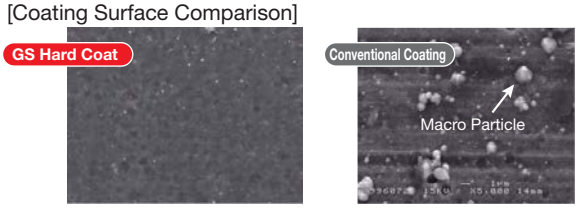




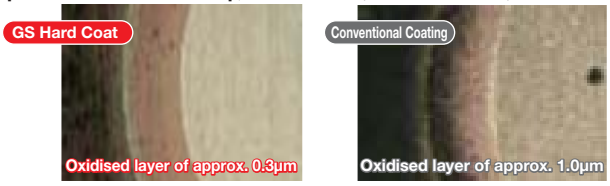


● GS Hard Coat

[Coating Surface Comparison]

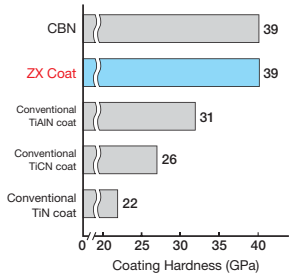


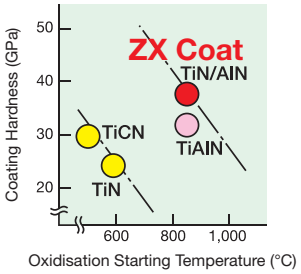
[Oxidation Resistance Evaluation] (Scratches from calotest performed after one-hour exposure to air at 1,100°C)



● ZX Coat

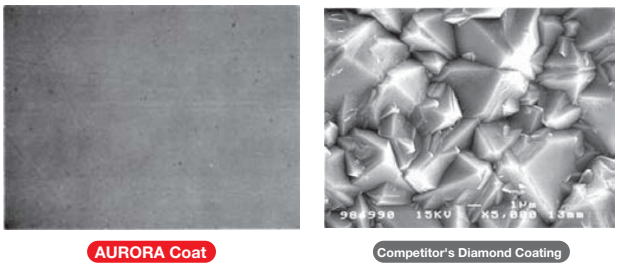
- Hardness almost equivalent to that of CBN
- Improvement in wear resistance, oxidation resistance and peel-off resistance
- Approx. 6 times longer tool life compared with uncoated products





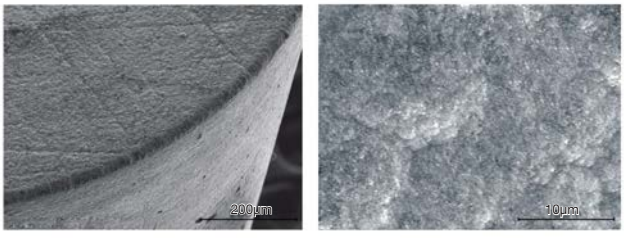
● AURORA Coat

- Very smooth AURORA COAT results in low adhesion as well as good surface finish
- Low cutting force enables high feed machining and milling of low rigidity workpieces
- Perfect for machining non-ferrous metal/copper electrodes



● SUMIDIA Coat

- Our original polycrystalline diamond coating technology achieves over 10 times higher wear resistance than uncoated carbide
- Realizes a micro-grain diamond film that provides the required combination of high strength and high wear resistance on smooth surfaces for CFRP milling

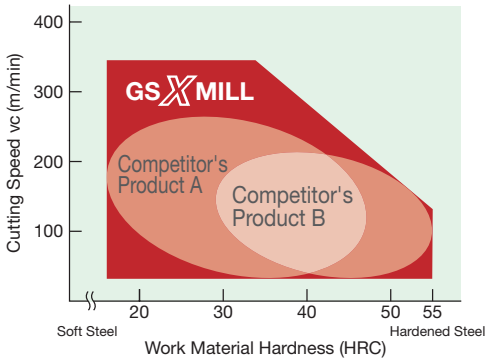


GSX MILL series

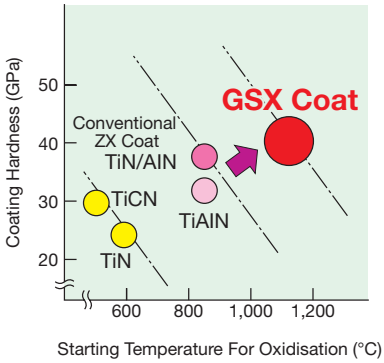
■ Features and Applications

- A wide selection with 3 types of cutting flute configurations and 4 cutting lengths to cover a wide range of applications
- Micro-grained carbide substrate provides high transverse rupture strength and excellent thermal shock resistance, improving reliability in wet cutting applications
- GSX Coat has increased wear resistance and thermal resistance for improved reliability and longer tool life
- Large rake angle and unique flute design improve sharpness and chip evacuation
- Utilizing a gash land improves cutting edge corner strength

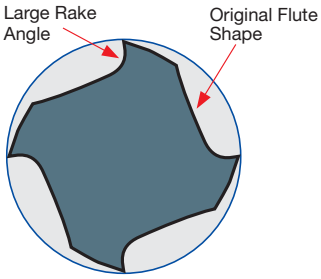
● Wear resistance



● Thermal resistance



● Improved chip evacuation



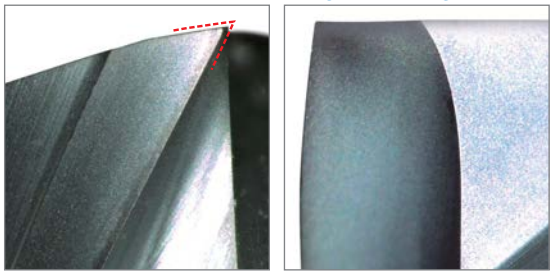
Large rake angle combined with our unique flute design improve sharpness and chip evacuation.

■ Expanded machining applications with 2 cutting edge corner styles

Sharp edged S type and fracture-resistant C type are available.

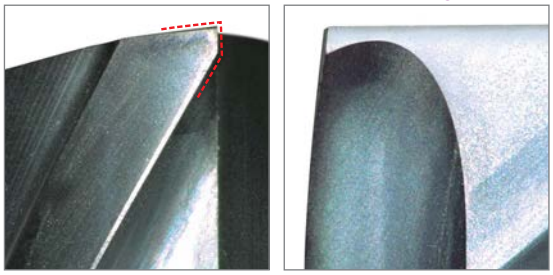
Corner

Sharp Corner: Sharp Edged Design S type

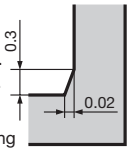


Corner

Gash Land: Fracture Resistant Design C type



Note: When using endmills with gash land, some material remains as shown on the right. Use the S type to obtain sharp corners.



Example: Corner after ø10mm milling (Unit: mm)

■ Work Material

◎: Best ○: Suitable Blank: Not recommended

P					H			M	S		K	N			
General Structural Rolled Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Die Steel	Hardened Steel 45 to 55HRC	Hardened Steel 55 to 60HRC	Hardened Steel 60HRC	Stainless Steel	Titanium Alloy	Heat-Resistant Alloy	Cast Iron	Aluminum Alloy	Copper Alloy	Graphite	CFRP
○	◎	◎	◎	◎	◎ *1			◎	○	○	○				

*1: GSXSLT30000C is recommended for 50 HRC or less.

■ Recommended Machining Examples (General-purpose type)

Applications	Side Milling		Groove Milling		Groove Finishing	
Form						
Cutting Edge Corner	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
S type		◎		○ *2		◎
C type	◎	○	◎	◎	◎	○

The S type is best for removing inside corners. *2: Use with small depth of cut.

GSX MILL series

■ Product Range

Applications	No. of Flutes	Cutting Edge Length						
		1.5D	2D		3D		4D	
		C type	S type	C type	S type	C type	S type	C type
General-purpose	2 Flutes	GSX20000C-1.5D ø0.5 to ø25.0mm →I30	GSX20000S-2D ø0.3 to ø25.0mm →I32	GSX20000C-2D ø0.5 to ø25.0mm →I36	GSX20000S-3D ø0.5 to ø25.0mm →I38	GSX20000C-3D ø0.5 to ø25.0mm →I40	GSX20000S-4D ø0.5 to ø25.0mm →I42	GSX20000C-4D ø0.5 to ø25.0mm →I44
	3 Flutes	GSX30000C-1.5D ø1.0 to ø12.0mm →I46		GSX30000C-2D ø1.0 to ø12.0mm →I48				
	4 Flutes	GSX40000C-1.5D ø1.0 to ø25.0mm →I50	GSX40000S-2D ø1.0 to ø25.0mm →I52	GSX40000C-2D ø1.0 to ø25.0mm →I54	GSX40000S-3D ø1.0 to ø25.0mm →I56	GSX40000C-3D ø1.0 to ø25.0mm →I58	GSX40000S-4D ø1.0 to ø25.0mm →I60	GSX40000C-4D ø1.0 to ø25.0mm →I62
Multi-purpose	3 Flutes	GSXSLT30000C-1.5D ø1.0 to ø12.0mm →I138						
Radius	4 Flutes		GSX40000-R-2D ø3.0 to ø12.0mm →I98					

High-efficiency Square type: GSV4000-2.5D →I70 GSXVL4000-2.5D →I72 High-efficiency Radius type: GSV4000-R-2.5D →I100 GSXVL4000-R-2.5D →I102
Ballnose type: GSXB20000 →I124

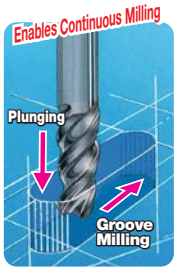
■ High Precision

● Endmill tolerance is reduced to 2/3 of conventional types, so diameter compensation is not required when changing tools.

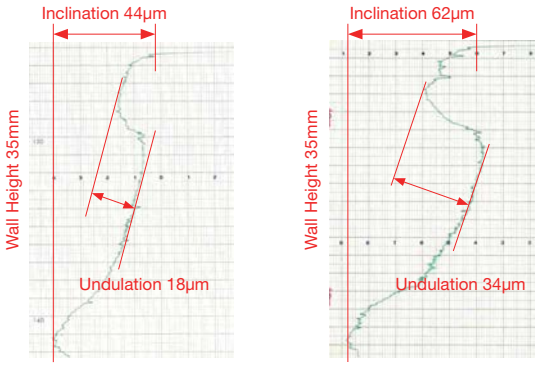
■ Multi-purpose

● Optimised flute design of slot mill 3 flute (short) type reduces cutting force.

(1) Continuous (composite) applications such as plunging and groove milling is possible
(2) Perfect for use with thin plates and small machining centres.



■ Long Cutting Edge Length with High Rigidity (C type)



GSX MILL-4D

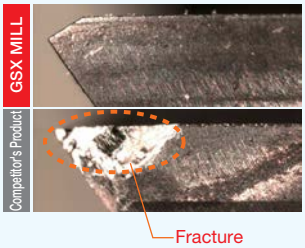
Tool Diameter	ø10 (2 Flutes)
Cutting Conditions	vc = 44m/min (n = 1,400min⁻¹)
Depth of Cut	ap = 35mm
	ae = 0.1mm × 25 times

Competitor's Product

Work Material	S50C
Feed Rate	vf=240mm/min (fz=0.086mm/t)
Coolant	Wet
Machine	Vertical Machining Centre BT30

■ Application Examples (Square)

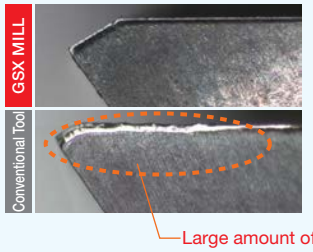
● Carbon Steel Groove Milling with GSX20000C



Gash land for stronger cutting edge

Tool Diameter	ø6 (2 Flutes)
Work Material	S50C
Cutting Conditions	vc=87m/min (n=4,615min⁻¹)
	vf=553mm/min(fz=0.06mm/t)
	ap=3mm
	ae=6mm
	Dry
Machine	Vertical Machining Centre BT50

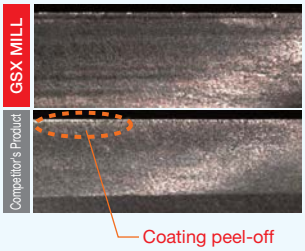
● Cast Iron Groove Milling with GSX20000C



GSX Coat for improved wear resistance

Tool Diameter	ø10 (2 Flutes)
Work Material	FCD600 equivalent
Cutting Conditions	vc=66m/min (n=2,100min⁻¹)
	vf=302mm/min(fz=0.072mm/t)
	ap=5mm × 5 times
	ae=10mm
	Dry
Machine	Vertical Machining Centre BT40

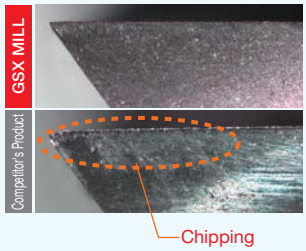
● Stainless Steel Machining with GSX20000C



Improved reliability even with wet machining

Tool Diameter	ø10 (2 Flutes)
Work Material	SUS304
Cutting Conditions	vc=50m/min (n=1,591min⁻¹)
	vf=127mm/min(fz=0.04mm/t)
	ap=10mm
	ae=0.5mm
	Dry
Machine	Vertical Machining Centre BT50

● S50C Side Milling with GSX20000S



The S type delivers optimum sharpness

Tool Diameter	ø6 (2 Flutes)
Work Material	S50C
Cutting Conditions	vc=87m/min (n=4,615min⁻¹)
	vf=553mm/min(fz=0.06mm/t)
	ap=10mm
	ae=0.3mm
	Dry
Machine	Vertical Machining Centre BT50

GSX MILL series

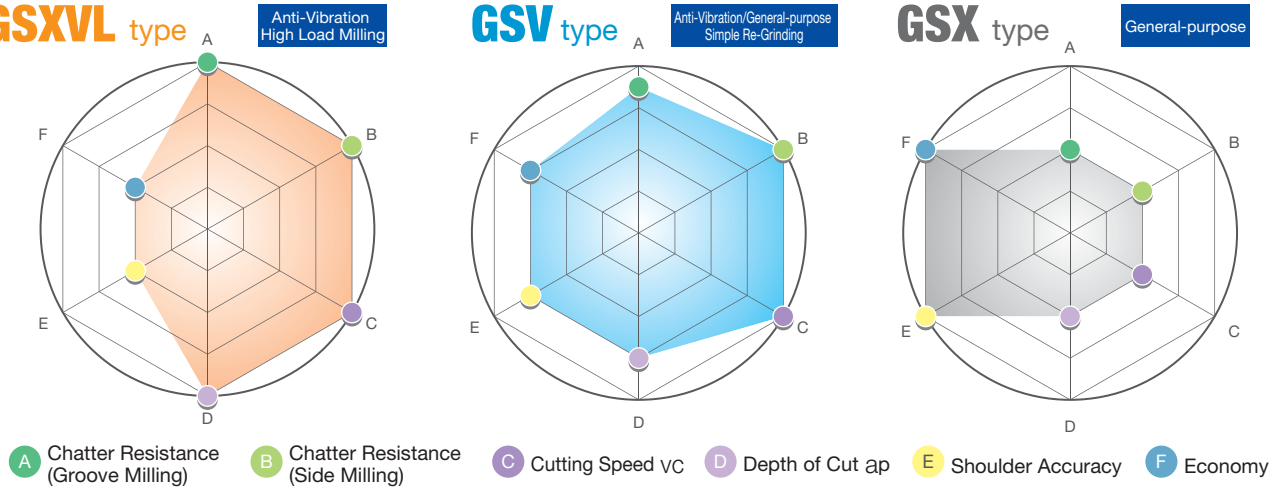
☞I72, I102 ☞I70, I100

■ Recommended Milling Examples

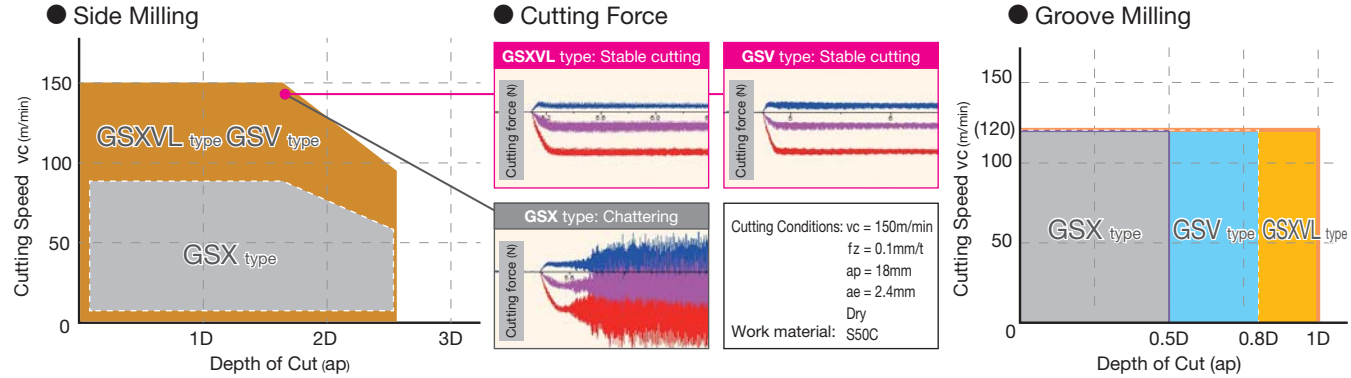
Applications	Side Milling		Groove Milling		Groove Finishing	
	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
GSXVL type	◎	○	◎	◎	◎	○
GSV type	◎	◎	○	◎	◎	○

■ Differentiating the Usage of Anti-vibration GSXVL type / GSV type

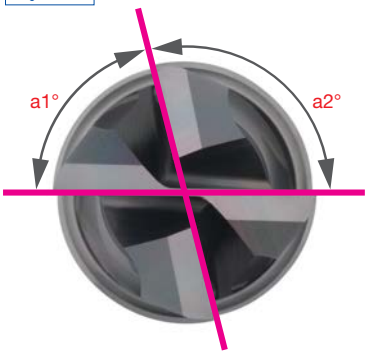
GSXVL types exhibit outstanding performance for high load milling. GSV type is both chatter-resistant and economical.



■ Application Range



Irregular Pitch a1° ≠ a2°



Irregular Lead b1° ≠ b2°

Regular Lead b2° = b2°

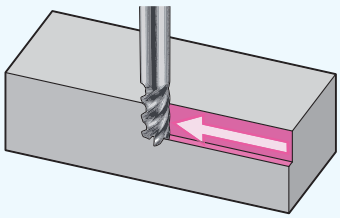
Rounded Land (Used for ø5mm and larger sizes)

GSX MILL series

■ Application Examples (Anti-vibration type)

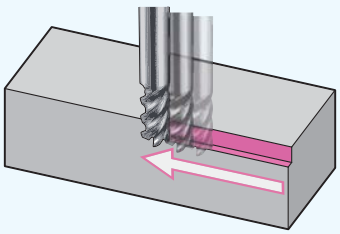
Work Material: S50C Tool Diameter: ø12 Cutting Conditions: Dry (Air Blow)

(1) Side Milling GSXVL ◯ / GSV type ◎



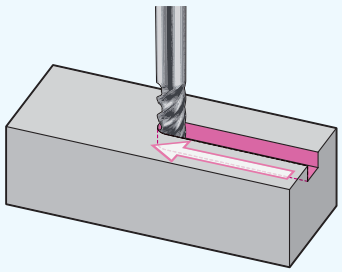
Cutting Conditions: vc = 102m/min (n = 4,100min^{-1}) Tool Diameter: ø8
vf = 1,080mm/min (0.1mm/t)
ap = 24mm, ae = 2.0mm

(2) High-speed Side Milling GSXVL ◎ / GSV type ◎



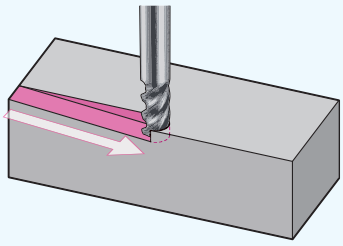
Cutting Conditions: vc = 151m/min (n = 4,000min^{-1}) Tool Diameter: ø12
vf = 4,800mm/min (0.3mm/t)
ap = 12mm, ae = 2.0mm

(3) Groove Milling GSXVL ◎ / GSV type ◯



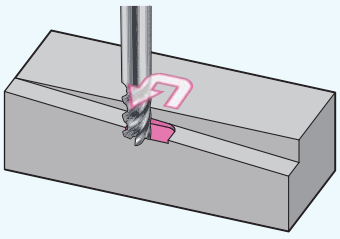
Cutting Conditions: vc = 90m/min (n = 2,400min^{-1}) Tool Diameter: ø12
vf = 960mm/min (0.1mm/t)
ap = 12mm

(4) Ramping GSXVL ◎ / GSV type ◯



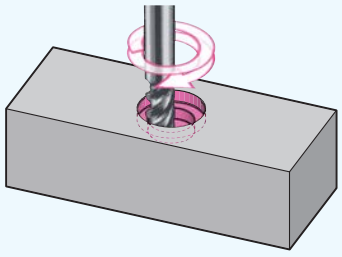
Cutting Conditions: vc = 90m/min (n = 2,400min^{-1}) Tool Diameter: ø12
vf = 480mm/min (0.05mm/t)
Ramp Angle 5°

(5) Seat Face Expansion Milling GSXVL ◎ / GSV type ◎



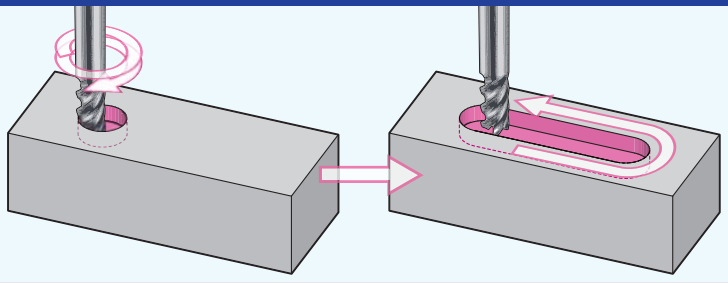
Cutting Conditions: vc = 90m/min (n = 2,400min^{-1}) Tool Diameter: ø12
vf = 960mm/min (0.1mm/t)

(6) Helical Milling x 2 GSXVL ◎ / GSV type ◎



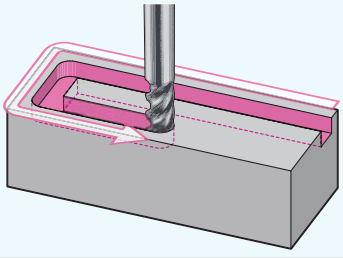
Cutting Conditions: vc = 90m/min (n = 2,400min^{-1}) Tool Diameter: ø12
vf = 480mm/min (0.05mm/t)
Ramp Angle 3°

(7) Helical Milling to Groove Expansion Milling x 2 GSXVL ◎ / GSV type ◎



Cutting Conditions: vc = 90m/min (n = 2,400min^{-1}) Tool Diameter: ø12
[Helical] vf = 480mm/min (0.05mm/t) [Groove Expansion] vf = 672mm/min (0.07mm/t) [Finishing] vf = 1,920mm/min (0.2mm/t)
Ramp Angle 3°
ap = 24mm, ae = 0.1mm

(8) Engraving GSXVL ◎ / GSV type ◯



Cutting Conditions: vc = 79m/min (n = 2,100min^{-1}) Tool Diameter: ø12
vf = 588mm/min (0.07mm/t)
ap = 12mm

GSX MILL series

☞I124

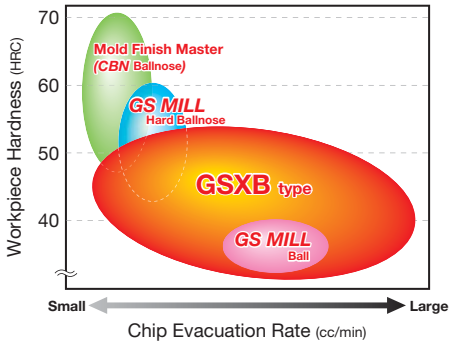
■ Recommended Milling Examples

Applications	Radius Milling		Profiling		Pocketing	
	Roughing	Finishing	Roughing	Finishing	Roughing	Finishing
GSXB type	◎	◎	◎	◎	◎	◎

■ Improved Thermal Resistance and Wear Resistance

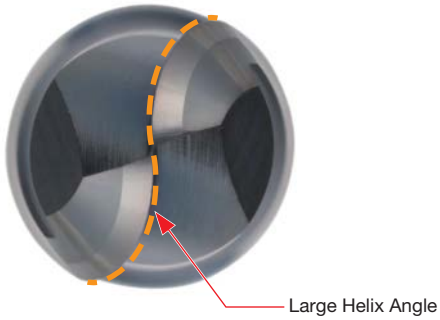
New coating combined with an ultra-fine grained carbide substrate for better thermal and wear resistance.

■ Application Range



■ Reduced Cutting Force

Large helix angle on curved cutting edge reduces cutting force

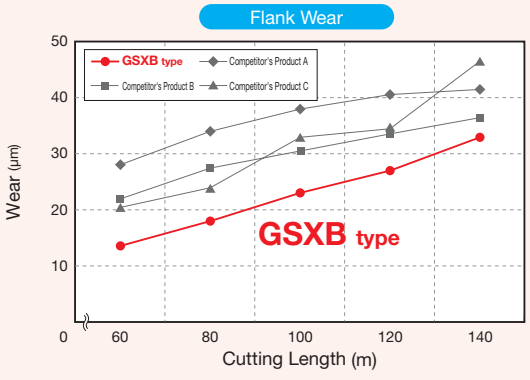


■ Improved Chip Evacuation

Unique pocket design and expanded pocket area promote better chip evacuation.

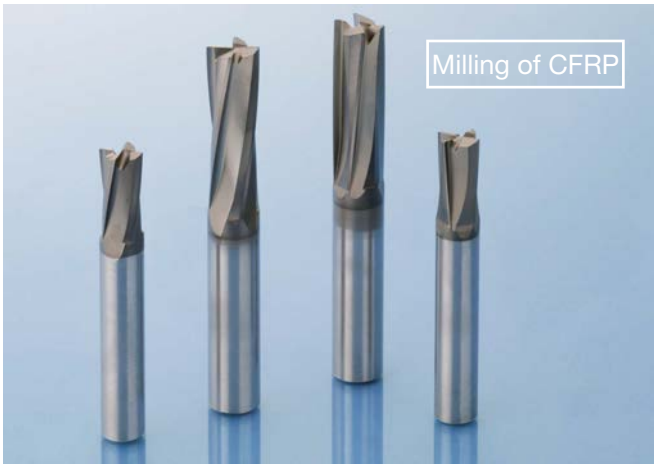
■ Application Examples

● Die Steel Machining with GSXB20000



Work Material: SKD61(50HRC)
Tool Diameter: R3.0 (2 Flutes)
Cutting Conditions: vc = 179m/min (n = 9,500min^{-1}), vf = 2,250mm/min (fz=0.12mm/t)
ap = 0.2 to 1.0mm, pf = 0.3mm, Wet
Equipment: Vertical Machining Centre BT40

SUMIDIA Coated SSDC series



I97

■ Product Range

Cat. No.	No. of Flutes	Shape	Diameter (mm)
SSDC 4000	4 Flutes	Right-hand Helix I97	ø6 to ø12
SSDC 4000RL	4 Flutes	Right-Left-hand Helix I97	ø6 to ø12

■ Features and Applications

● Two different types of flute shapes are available.

SSDC type (Right-hand Helix type)

Achieving both better sharpness and longer tool life through optimising the rake and relief angles, along with a small helix angle.

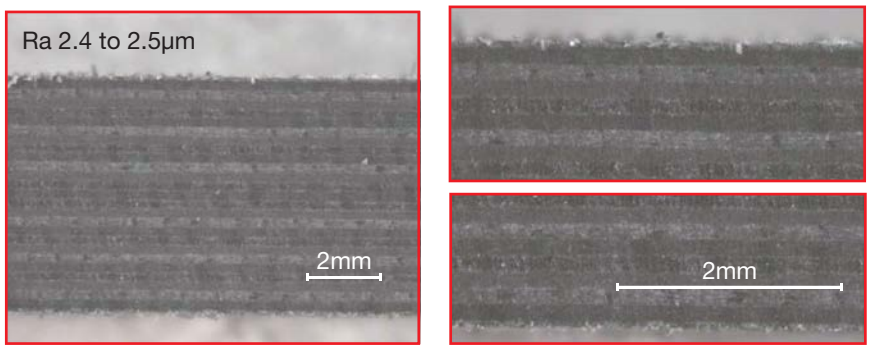
SSDCRL type (Right-Left-hand Helix type)

Right-Left-hand helix prevents delamination on top and bottom surfaces.
Cutting force is dispersed even with unstable clamping, improving surface quality.

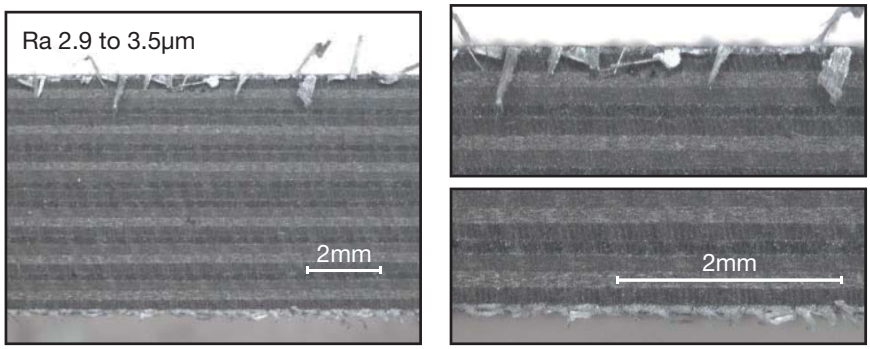
■ Performance

● Surface Finish Comparison

SSDC type



Competitor's Product



Work Material: CFRP
Tool Diameter: ø10 (4 Flutes)
Cutting Conditions: vc=314m/min
(n = 10,000min^{-1})
vf = 1,000mm/min
(fz = 0.025mm/t)
Dry

Results

SSDC type

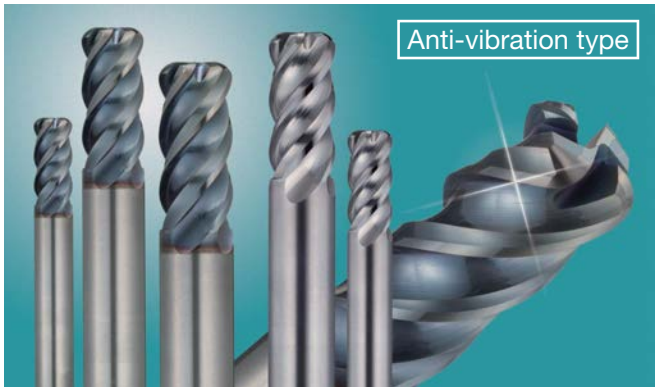
High surface quality with no burrs

Competitor's Product

Burrs are formed.
Low surface quality

SSEH series

I108, I110, I119



I104, I106, I118

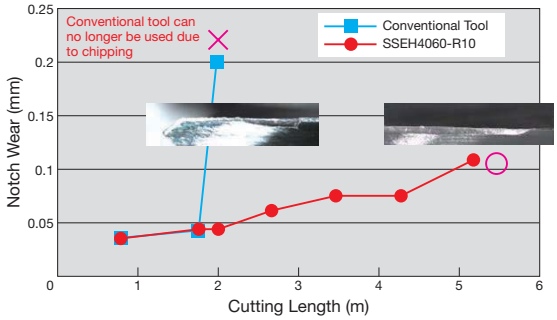
SSEH type Radius

■ Features and Applications

- High helix (45° helix) improves sharpness.
- Combination of unique flute design and semi-mirrored rake face improves chip evacuation and adhesion resistance.
- Ultra-smooth coating with improved hardness and thermal resistance combined with tough carbide substrate improves tool life when working with heat-resistant alloys.
- Unique, smooth radius shape mitigates cutting impact and improves fracture resistance.
- Both coated and uncoated types are in stock to meet various conditions.

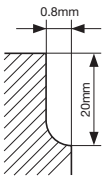
■ Application Examples

- Inconel 718 (Side Milling)



Tool Diameter: ø6 x R1
Cutting Conditions: vc = 20m/min, fz = 0.025mm/t,
ap = 5mm, ae = 0.5mm Wet

- Inconel 713 (Side Milling)

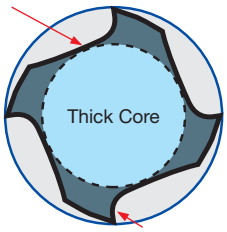


In Sumitomo Electric Hardmetal tests, the special coating with excellent adhesion resistance provided less cutting edge adhesion than the competitor's product and enabled fracture-free machining. The competitor's product suffered from edge adhesion leading to breakage.

Tool Diameter: ø10 x R1 Number of Workpieces: 150pcs./unit
Cutting Conditions: vc=32m/min, fz=0.018mm/t,
ap=20mm, ae=0.8mm Dry

Unique, smooth radius design

Original wide arc flute



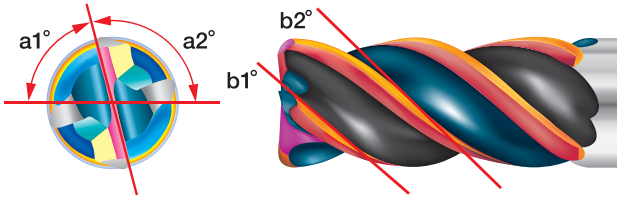
Semi-mirrored Rake Face

SSEH Radius Anti-vibration type

■ Features and Applications

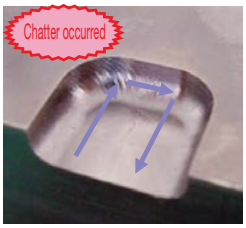
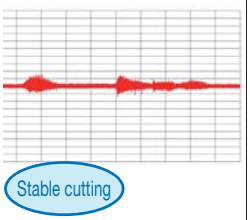
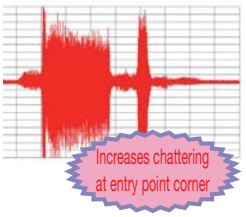
- New anti-vibration type added to the SSEH type endmill for exotic alloys.
- Builds on the same features of existing endmills by adding an irregular lead for exceptional anti-vibration performance.
- Compatible with a wide range of milling for exotic alloys including SUS, Inconel and Titanium.
- Reduces chattering for high-speed, high-feed cutting.
- Both coated and uncoated types are in stock to meet various conditions.

Irregular Pitch + Irregular Lead



■ Application Examples

- Corner Finishing for Titanium Alloy

	SSEH Radius Anti-Vibration Endmill SSEHVL 4120W-30	No Anti-Vibration Mechanism Endmill ø12 x R3.0
Machined Surface		
Vibration Data		
Tool Breakage		

Cutting Conditions: vc = 42.4m/min (n = 1,125min^{-1})
vf = 200mm/min (fz = 0.044min/t)
ap = 5.0mm, ae = 12mm Wet

Safe-Lock™ Compatible Endmill series (License by HAIMER®)

☞I106, I110

■ Features and Applications

- Combination with SAFE-λOCK™ SAFE-LOCK prevents tools from coming off even during high load milling such as groove milling and roughing, and enables highly efficient machining.
- Defects are prevented because there will be no damage to workpieces from tools falling off.
- Endmill can be pushed out after regrinding so that the same tool height can be maintained. No need for overall length adjustment for milling unit.

■ SAFE-λOCK™ Applicable Products

Cat. No.	No. of Flutes	Shape	Diameter (mm)
SSEHVL 4000WS-R	4 Flutes	Radius ☞I106	ø12.0 to ø25.0

Cat. No.	No. of Flutes	Shape	Diameter (mm)
SSEH 4000WS-R	4 Flutes	Radius ☞I110	ø12.0 to ø25.0

■ SAFE-λOCK™ Applicable Holders

● Shrink-fit Chuck Holder

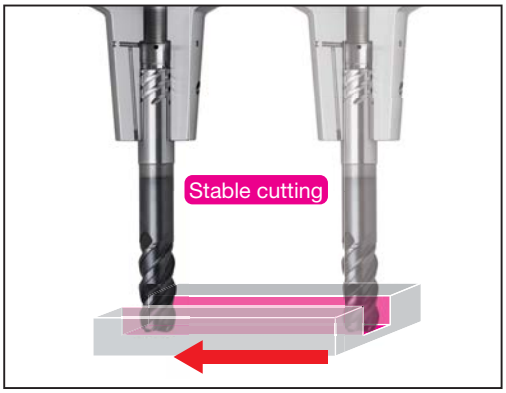
· High runout accuracy ensures long tool life.
· Easy setup with a dedicated shrink-fit unit.
· High rigidity provides high resistance to chattering.

● Collet Chuck Holder

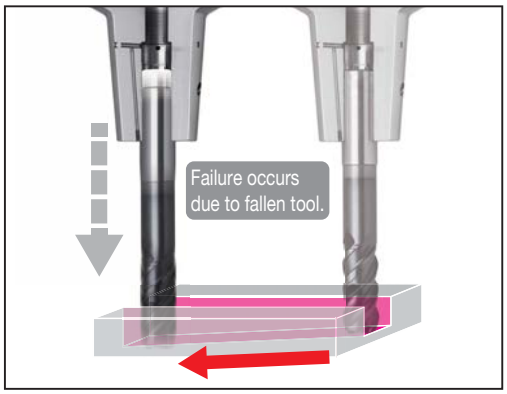
· Tool change-over is simple.
· Specially designed collet provides strong grip.
· High rigidity provides high resistance to chattering.

■ Concept Illustration of Groove Milling

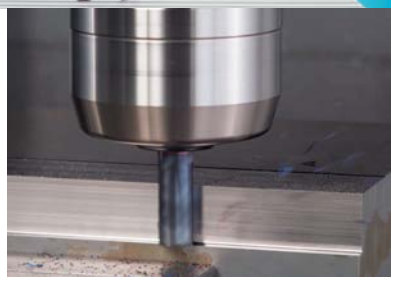
● SAFE-λOCK™ With Anti-fall Mechanism



● Without Anti-fall Mechanism



GS MILL Hard series

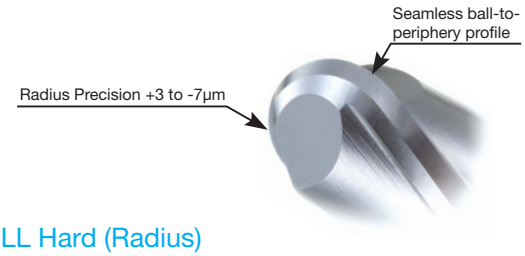


Side Milling of SKD61 (53HRC) with GS MILL Hard Radius

■ Features

GS MILL Hard (Square/Ballnose/Radius)

- With the high-Al content Al-Ti-Cr coating GS HARD Coat, oxidation resistance is now 3 times higher at 1,100°C, thereby improving thermal and wear resistance under ultra-high speed machining conditions.
- Coating surface roughness is similar to the standard GS Coat, which reduces cutting friction while enhancing smooth cutting.
- Ultra-fine grain high-hardness cemented carbide substrate with low cobalt content has been newly developed to improve substrate strength. This increases tool durability and prevents micro-plastic deformation of the cutting edge that occurs during ultra-high speed machining.
- New unique cross-sectional design achieves better chip evacuation and tool rigidity.
- Hard (Radius) / New endmill series with improved fracture resistance.
- Hard (Ballnose) / Utilises a new coating with excellent lubricity and thermal resistance. Achieves precision finishing of hardened steel, with a precise radial tolerance of +3 to -7µm and a seamless ball to periphery profile.



■ Product Range

● GS MILL Hard (Square/Ballnose)

Cat. No.	No. of Flutes	Shape	Diameter (mm)
GSH 4000SF **GSH 6000SF** **GSH 8000SF**	4 Flutes 6 Flutes 8 Flutes	I76, I77, I78	ø1 to ø20
GSBH 20000SF	2 Flutes	I126	R0.2 to R6.0 (ø0.4 to ø12)

● GS MILL Hard (Radius)

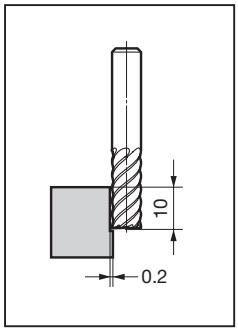
Cat. No.	No. of Flutes	Shape	Diameter (mm)
GSH 6000SF-R **GSH 8000SF-R**	6 Flutes 8 Flutes	I116, I117	ø6 to ø20

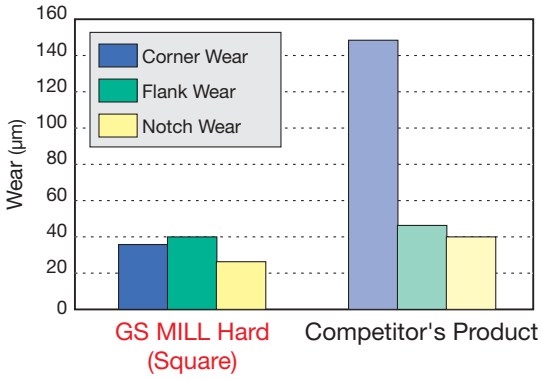
■ GS MILL Hard (Square)

● Cutting Performance (6 Flutes, ø10 Side Milling)

Work Material: SKD61(53HRC)
Tool: GSH 6100SF (ø10)
Cutting Length: 75m
Cutting Conditions: vc = 800m/min (n = 25,460min^{-1})
fz = 0.07 mm/t (f = 10,500mm/min)
ap = 10mm, ae = 0.2mm
Dry (Air Blow), Down Cut

Dimensions (mm)



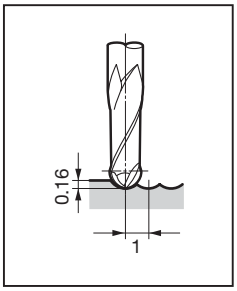


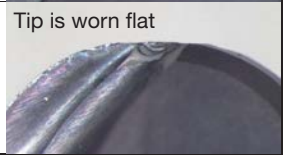
■ GS MILL Hard (Ballnose)

● Application Example (Precision Forging Die for Automotive Components)

Work Material: SKH51(62HRC)
Tool: GSBH 20300SF (R3)
Cutting Length: Approx. 150m
Cutting Conditions: vc = 75m/min (n = 4,000min^{-1})
n = 4,000min^{-1}
fz = 0.075 mm/t (f = 600mm/min)
ap = 0.16mm, pf = 1mm

Dimensions (mm)



GS MILL Hard (Ballnose)	Very small amount of wear
Competitor's Product	Tip is worn flat 

AURORA Coat Endmills

I90, I91, I127

I128

■ Features and Applications

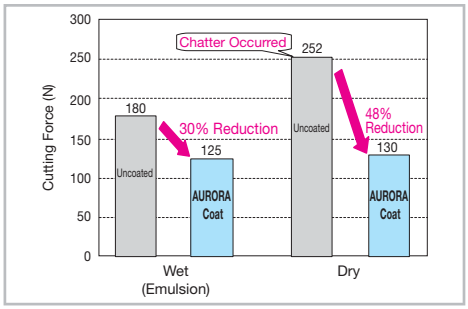
- Very smooth AURORA Coat results in low adhesion as well as a good surface finish
- With lower cutting forces and high rigidity, this series is suitable for low rigidity machines
- Available in 2- and 4-flute square type as well as ballnose type endmills
- Added R0.05 to R2.00mm long neck ballnose endmills for machining copper electrodes

■ Product Range

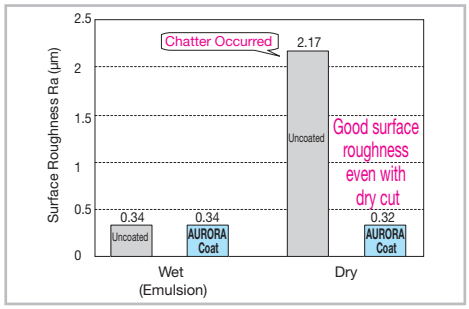
Cat. No.	No. of Flutes	Shape	Diameter (mm)
ASM 2000DL	2 Flutes	Square I90	ø2 to ø16
ASM 4000DL	4 Flutes	Square I91	ø2 to ø16
SNB 2000DL	2 Flutes	Ballnose I127	R1 to R8 (ø2 to ø16)
SNB2	2 Flutes	Long Neck Ballnose I128	R0.05 to R2 (ø0.1 to ø4)

■ Performance

● Comparison of Cutting Force



● Surface Roughness Comparison

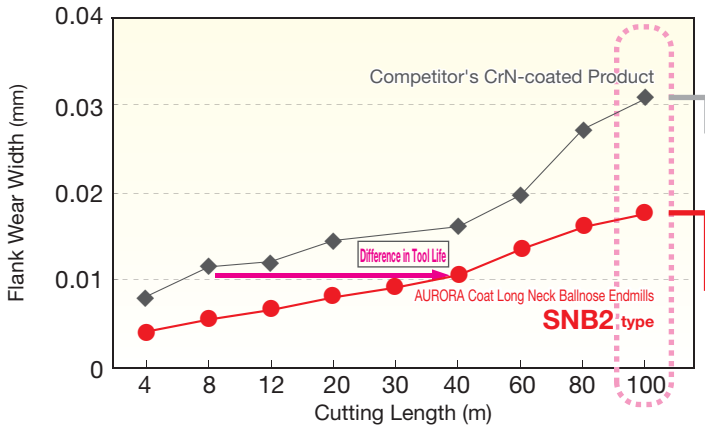


Work Material: A5052
Tool: ASM4100DL
ø10 (4 Flutes)
Cutting Conditions:
vc = 200m/min
n = 6,300min^{-1}
fz = 0.05mm/t
vf = 1,300mm/min
ap = 10mm
ae = 1mm
Down-cut

■ AURORA Coat Long Neck Ballnose Endmill SNB 2 type

- Achieves longer tool life compared with chromium nitride (CrN)-coated carbide tools
- Products with ballnose radii of 0.05 to 2.00mm
- Reduced coefficient of friction
- Extremely smooth coating layer

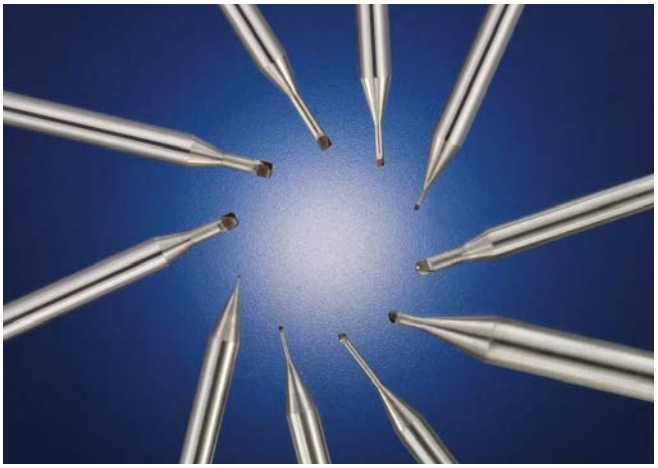
● Tool Wear Comparison



Tool	Cutting Length 100m	Cutting Conditions
Competitor's CrN-coated Product		Work Material: Tough-pitch Copper Tool: R0.3mm Ballnose Endmill Cutting Conditions: vc = 57m/min n = 30,000min^{-1} vf = 700mm/min ap = 0.035mm ae = 0.03mm Oil Mist
SNB2 type		

Excellent adhesion resistance in copper alloy milling with long tool life!

Mold Finish Master series



MOLD FINISH MASTER

MOLD FINISH MASTER

SUMIDIA BINDERLESS Endmills

NPDRS type/NPDBS type/NPDB type

SUMIDIA Coated Endmills

SDCB type

SUMIBORON Endmills

BNBR type/BNBP type/BNBC type

SUMIDIA BINDERLESS Radius Endmills

NPDRS type

Radius r

Binderless PCD

For Standard Finishing

I120

For Finishing of Cemented Carbide and Hard Brittle Materials

SUMIDIA BINDERLESS Ballnose Endmills

NPDBS type/NPDB type

Ballnose R

Binderless PCD

For Standard Finishing

For Precision Finishing

I130, I131

For Finishing of Cemented Carbide and Hard Brittle Materials

- Nano-polycrystalline diamond, which is harder than single-crystal diamond, is used for the cutting edge
- Enables direct engraving of cemented carbide, which is impossible for existing single-crystal or polycrystalline diamonds
- Ideal for finishing hard brittle materials, including cemented carbide. Realizes high-precision machining and long tool life
- Standard finish NPDBS type dramatically reduces machining cost
- Precision finish NPDB type prevents deformation by eliminating polishing process

SUMIDIA Coat Ballnose Endmills

SDCB type

Ballnose R

SUMIDIA Coat

For Rough/Medium-Finishing

I132

For Rough/Medium Finishing of Cemented Carbide and Hard Brittle Materials

- Realizes high-efficiency rough/medium finishing of carbide molds
- Newly developed diamond coating exhibits stable tool life
- Achieves the highest level of precision when used in combination with SUMIDIA BINDERLESS endmills

SUMIBORON Radius Endmills

BNBR type

Radius r

CBN

I122

For Hardened Steel

SUMIBORON Ballnose Endmills

BNBP type

Ballnose R

CBN

I134

For Hardened Steel

- Achieves longer tool life in high-speed, high-precision machining from pre-hardened steel to high-hardness steel in excess of 60HRC.
- Excellent machined surface quality drastically reduces the grinding process.
- Edge design suited for profiling and face milling plus an extensive selection of grades allows a wide range of machining applications.

SUMIBORON Ballnose Endmills

BNBC type

Ballnose R

CBN

I136

For Copper Electrodes

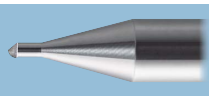
- Ballnose radii of R0.1mm to R0.5mm are available in this series
- Utilising a high CBN content grade provides excellent edge sharpness and wear resistance
- Achieves high quality milling with high precision cutting edge

Mold Finish Master series

SUMIDIA BINDERLESS Radius Endmills
NPDRS type

Hard Brittle Material

SUMIDIA BINDERLESS Ballnose Endmills
NPDBS type/NPDB type



Hard Brittle Material

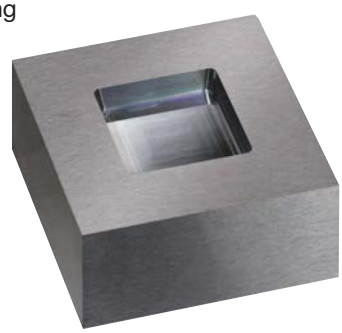
■ General Features

SUMIDIA BINDERLESS is polycrystalline diamond that directly binds nano-sized diamond particles with high strength without using any binders. Harder than single-crystal diamond, it has no cleavability, enabling machining of hard brittle material such as cemented carbide and making new machining methods possible.

■ Features

- SUMIDIA BINDERLESS is a pure diamond material, but unlike single-crystal diamonds, it has no anisotropy. It therefore displays excellent wear resistance with less uneven wear.
- Thanks to its polycrystalline structure, SUMIDIA BINDERLESS does not have the cleavability peculiar to single-crystal diamonds and displays excellent fracture resistance.

● Pocketing

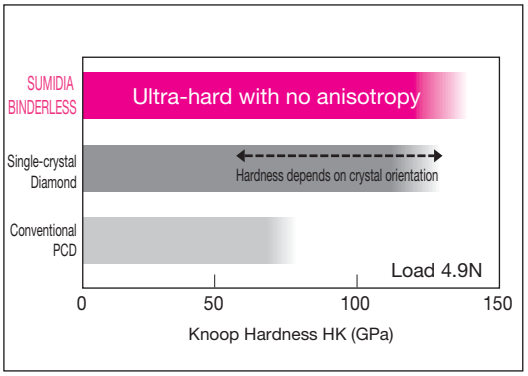


Work Material	: Cemented Carbide VF20 (Ultra-fine Grain AF1, 92.5HRA)
Machining Application	: 10mm x 10mm x depth 2mm
Tool	: NPDRS 1100R005-030 (ø1 x Corner Radius R0.05mm)
Cutting Conditions	: n = 40,000min^{-1}, vf = 200mm/min pf = 0.005mm Oil Mist
Surface Roughness	: Ra 0.015μm
Cutting Time	: 2 Hours

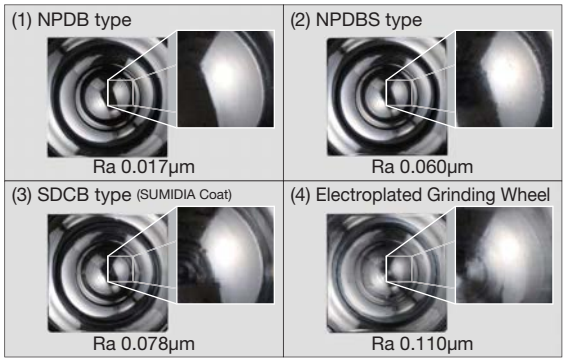
● Application to Medical Use (μ-TAS Mold)

Work Material	: Cemented Carbide VF20 (Ultra-fine Grain AF1, 92.5HRA)
Tool	: NPDB 1030-010 (Ballnose Radius R0.3mm)
Cutting Conditions	: n = 38,000min^{-1}, vf = 95mm/min pf = 0.001mm Wet (Oil-based)
Machining Allowance	: 0.003mm
Surface Roughness	: Ra 0.016 to 0.020μm
Machining Distance	: 8.3m
Cutting Time	: Finishing 1 Hour 28 Minutes

■ Hardness



● Hemispherical Surface Milling



Work Material	: Cemented Carbide VF20 (Ultra-fine Grain AF1, 92.5HRA)
Machining Application	: ø6 (Hemispherical Surface Milling)
Tool	: (1) NPDB 1050-020 (Ballnose Radius R0.5mm) (2) NPDBS 1050-020 (Ballnose Radius R0.5mm) (3) SDCB 2R050-020 (Ballnose Radius R0.5mm) (4) R0.5, #400
Cutting Conditions	: n = 40,000min^{-1}, vf = 120mm/min pf = 0.005mm Oil Mist
Cutting Time	: 1 Hour 30 Minutes

● Application to Optical Use (Fly-Eye Lens Mold)

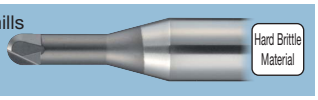
Work Material	: Cemented Carbide VF20 (Ultra-fine Grain AF1, 92.5HRA)
Tool	: Finishing: NPDB 1050-020 (Ballnose Radius R0.5mm) Roughing: Diamond-Coated Endmill (Ballnose Radius R0.5mm)
Cutting Conditions	: n = 60,000min^{-1}, vf = 300mm/min pf = 0.005mm Oil Mist
Surface Roughness	: Ra 0.015μm
Cutting Time	: Finishing 2 Hours 40 Minutes Roughing 55 Minutes

Mold Finish Master series

Ballnose R

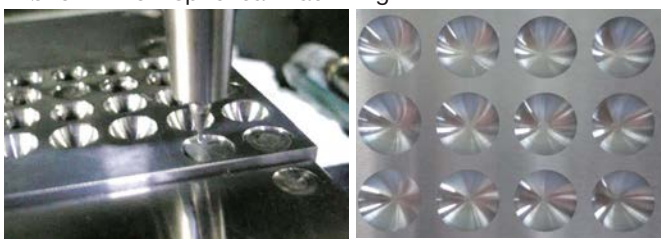
SUMIDIA Coat Ballnose Endmills

SDCB type



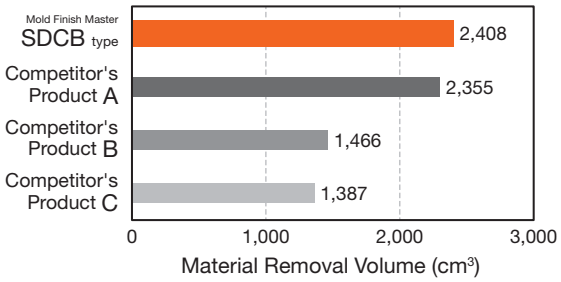
- Realizes high-efficiency roughing/medium finishing of carbide molds
- Newly developed diamond coating exhibits stable tool life
- Achieves the highest level of precision when used in combination with SUMIDIA BINDERLESS endmills

● ø10mm hemispherical machining

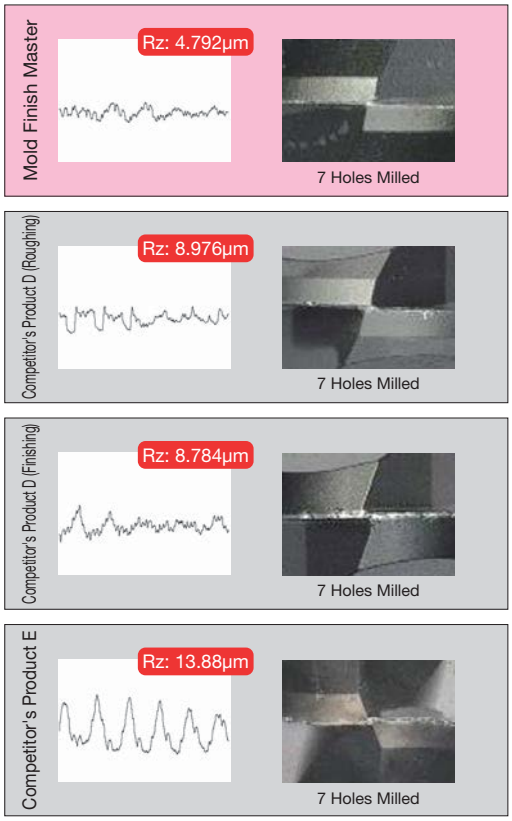


Work Material: Cemented Carbide AF1 (Ultra-Fine Grained Carbide)
Tool: SDCB 2R100-060
Cutting Conditions: n = 30,000min^{-1}, vf = 300mm/min
ae = 0.3mm, ap = 0.1mm Air Blow

Tool Life



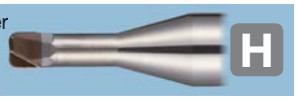
● ø2.0 (ball radius R1.0mm) number of workpieces and tool damage (delamination)



Radius r

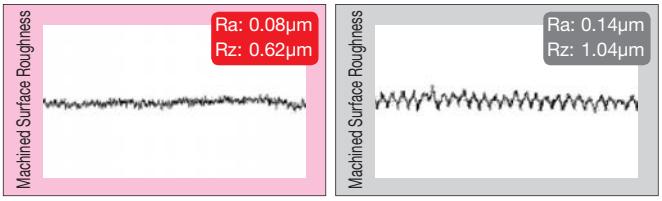
SUMIBORON Mold Finish Master

BNBR type

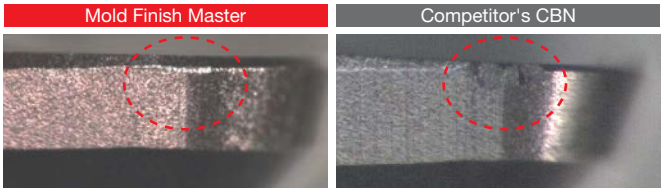


- Improved machined surface quality through use of a wiper edge (available on ø1.0mm drills and larger).

Machined Surface Comparison

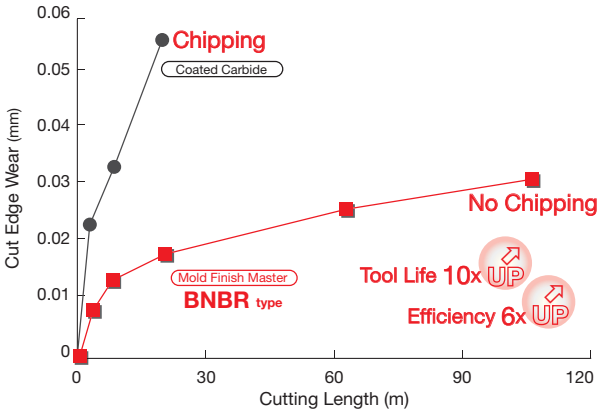


- Achieving longer tool life with the combination of SUMIBORON BNX20, which has excellent wear resistance, and an optimised cutting edge design.

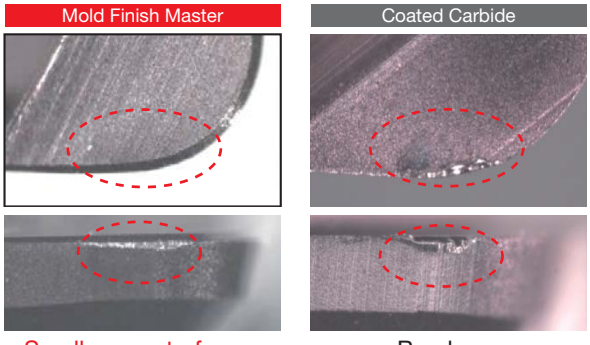


Work Material: STAVAX (52HRC)
Tool: BNBR 2D200R050-0604 (ø2 x Corner Radius R0.5mm)
Cutting Conditions: n = 20,000min^{-1}, vf = 400mm/min
ap = 0.03mm, pf = 0.70mm Oil Mist

- Excellent wear resistance delivers almost 10 times longer tool life than carbide endmills.



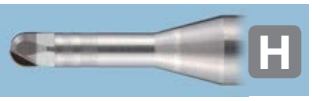
Tool Wear Comparison



Work Material: STAVAX (52HRC)
Tool: BNBR 2D200R050-0604 (ø2 x Corner Radius R0.5mm)
Mold Finish Master
Cutting Conditions: n = 20,000min^{-1}, vf = 800mm/min
ap = 0.03mm, pf = 0.70mm Oil Mist
Coated Carbide
Cutting Conditions: n = 4,800min^{-1}, vf = 120mm/min
ap = 0.03mm, pf = 0.70mm Oil Mist

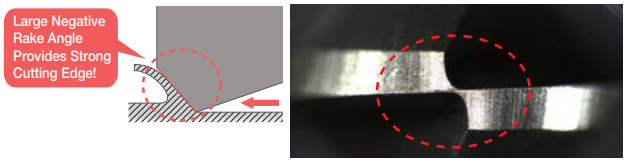
Mold Finish Master series

SUMIBORON Mold Finish Master BNBP type



H

- Achieves high-precision machining with precise ball radius of ±0.005mm.
- Achieving stable interrupted milling with the combination of SUMIBORON BN350, which has excellent fracture resistance, and a cutting edge with a negative rake angle design.



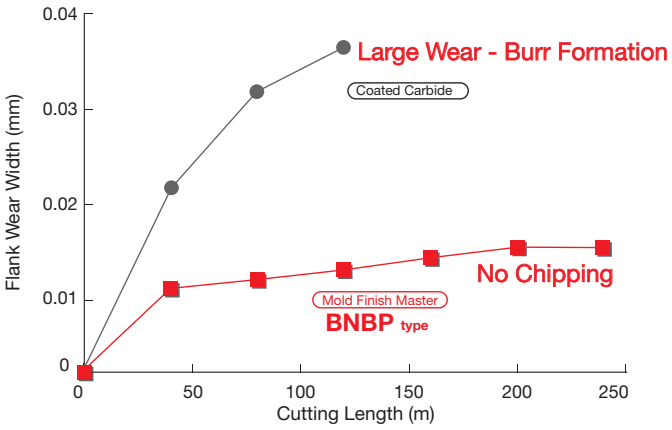
Center cutting edge, stable machined surface quality

- Strong cutting edge enables use in roughing applications

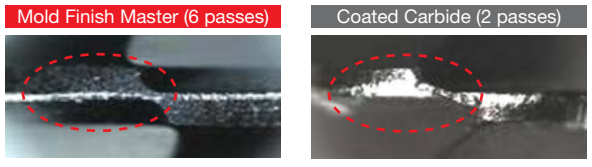
No fracture　　Chipping at center cutting edge

Work Material: STAVAX (52HRC)
Tool: BNBP 2R100-0554 (Ballnose Radius R0.1mm)
Cutting Conditions: n = 25,000min^{-1}, vf = 1,500mm/min
ap = 0.10mm, pf = 0.20mm Oil Mist

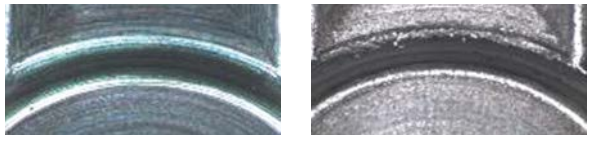
- Excellent wear resistance and machined surface quality



Tool Wear Comparison



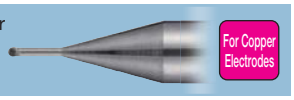
Small amount of wear　　Large amount of wear



Good machined surface　　Burr formation

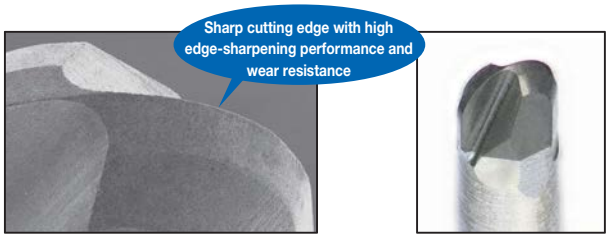
Work Material: STAVAX (52HRC)
Tool: BNBP 2R030-0154 (Ballnose Radius R0.3mm)
Cutting Conditions: n = 25,000min^{-1}, vf = 1,500mm/min
ap = 0.05mm, pf = 0.10mm Oil Mist

SUMIBORON Mold Finish Master BNBC type

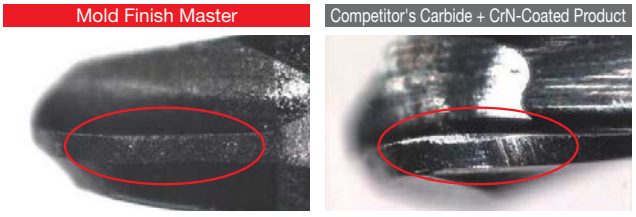


For Copper Electrodes

- Ballnose radii of 0.1 to 0.5mm are available in this series.
- Achieves high quality milling with high precision cutting edge.



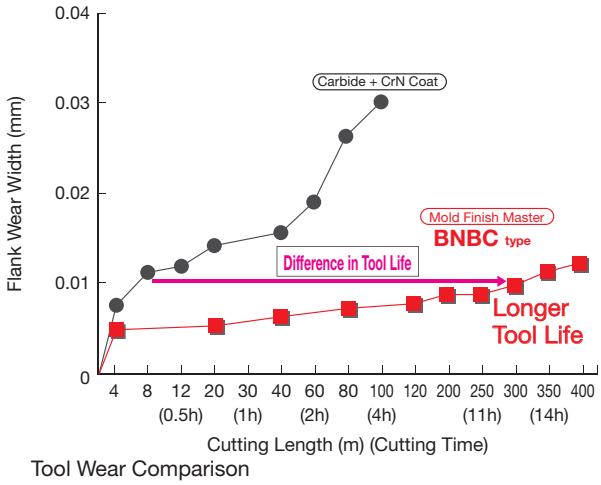
- Achieves further improved tool life



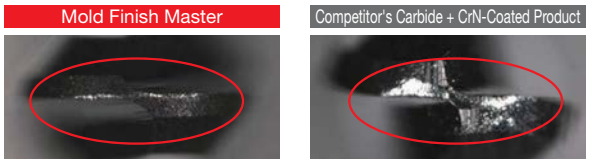
Low Wear (Cutting Length 400mm)　　High Wear (Cutting Length 100mm)

Work Material: Tough-pitch Copper (Side Milling)
Tool: BNBC 2R030-0304 (Ballnose Radius R0.3mm)
Cutting Conditions: n = 30,000min^{-1}, vf = 700mm/min
ap = 0.035mm, ae = 0.03mm Oil Mist

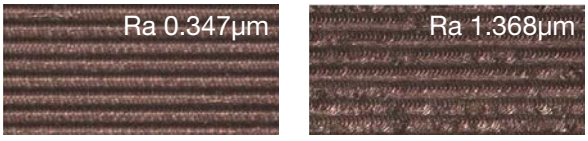
- Utilisation of high CBN content grade promotes excellent edge sharpness and wear resistance



Tool Wear Comparison



Microwear, can still be used　　Large amount of wear



Good cutter marked surface with BNBC type

Work Material: Tough-pitch Copper
Tool: BNBC 2R030-0304 (Ballnose Radius R0.3mm)
Cutting Conditions: vc = 57m/min, n = 30,000min^{-1}
fz = 0.007mm/t, vf = 400mm/min
ap = 0.005mm, ae = 0.05mm Oil Mist

GSX 20000C-1.5D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing | Helical Milling | Ramping

Fig 1

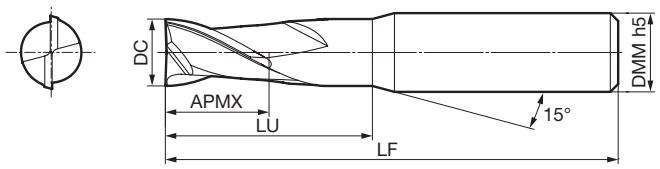
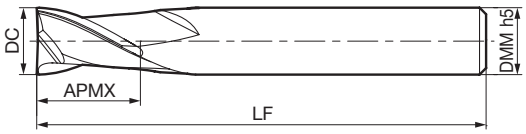


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20050C-1.5D	●	**0.5**	1.0	1.4	40	4	1
20100C-1.5D	●	**1.0**	1.5	2.5	40	4	1
20150C-1.5D	●	**1.5**	2.3	3.3	40	4	1
20200C-1.5D	●	**2.0**	3.0	4.0	40	4	1
20250C-1.5D	●	**2.5**	3.8	4.8	40	4	1
GSX 20300C-1.5D	●	**3.0**	4.5	6.0	45	6	1
20350C-1.5D	●	**3.5**	5.3	6.8	45	6	1
20400C-1.5D	●	**4.0**	6.0	7.5	45	6	1
20450C-1.5D	●	**4.5**	6.8	8.3	50	6	1
20500C-1.5D	●	**5.0**	7.5	9.5	50	6	1
GSX 20550C-1.5D	●	**5.5**	8.3	10.3	50	6	1
20600C-1.5D	●	**6.0**	9.0	—	50	6	2
20650C-1.5D	●	**6.5**	10.0	12.0	60	8	1
20700C-1.5D	●	**7.0**	11.0	13.0	60	8	1
20750C-1.5D	●	**7.5**	12.0	14.0	60	8	1
GSX 20800C-1.5D	●	**8.0**	12.0	—	60	8	2
20850C-1.5D	●	**8.5**	13.0	15.0	70	10	1
20900C-1.5D	●	**9.0**	14.0	16.0	70	10	1
20950C-1.5D	●	**9.5**	15.0	17.0	70	10	1
21000C-1.5D	●	**10.0**	15.0	—	70	10	2
GSX 21050C-1.5D	●	**10.5**	16.0	18.5	75	12	1
21100C-1.5D	●	**11.0**	17.0	19.5	75	12	1
21150C-1.5D	●	**11.5**	18.0	20.5	75	12	1
21200C-1.5D	●	**12.0**	18.0	—	75	12	2
21300C-1.5D	●	**13.0**	20.0	23.5	90	16	1
GSX 21400C-1.5D	●	**14.0**	21.0	24.5	90	16	1
21500C-1.5D	●	**15.0**	23.0	26.5	90	16	1
21600C-1.5D	●	**16.0**	24.0	—	90	16	2
21700C-1.5D	●	**17.0**	26.0	30.5	100	20	1
21800C-1.5D	●	**18.0**	27.0	31.5	100	20	1
GSX 21900C-1.5D	●	**19.0**	29.0	33.5	100	20	1
22000C-1.5D	●	**20.0**	30.0	—	100	20	2
22500C-1.5D	●	**25.0**	38.0	—	120	25	2

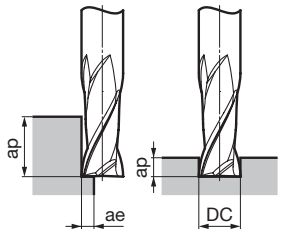
Grade: ACF20

Identification Code

GSX 2 1000 C - 1.5D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 20000C-1.5D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
1.0		19,600	250	19,600	250	19,600	250	18,300	180	12,700	100	9,000	60	11,000	70	9,000	50
2.0		11,200	340	11,200	340	11,200	340	10,500	240	7,300	130	5,300	80	6,400	90	5,300	70
4.0		6,400	460	6,400	460	6,400	460	6,000	320	4,200	180	3,000	110	3,600	120	3,000	90
6.0		4,600	560	4,600	560	4,600	560	4,300	400	3,000	210	2,200	130	2,700	140	2,200	100
8.0		3,400	560	3,400	560	3,400	560	3,200	400	2,200	210	1,600	130	2,000	140	1,600	100
10.0		2,800	560	2,800	560	2,800	560	2,600	400	1,800	210	1,300	130	1,600	140	1,300	100
12.0		2,300	560	2,300	560	2,300	560	2,200	400	1,500	210	1,100	130	1,300	140	1,100	100
16.0		1,700	450	1,700	450	1,700	450	1,600	320	1,100	180	800	100	1,000	110	800	85
20.0		1,350	380	1,350	380	1,350	380	1,300	280	900	160	650	90	800	100	650	75
25.0		1,080	300	1,080	300	1,080	300	1,040	220	720	130	520	70	640	80	520	60
Standard Depth of Cut	ap	1.5DC										1.0DC					
	ae	0.05DC										0.02DC					

Groove Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
1.0		19,600	200	19,600	250	19,600	250	18,300	180	12,700	100	9,000	60	11,000	50	4,500	20
2.0		11,200	270	11,200	340	11,200	340	10,500	240	7,300	130	5,300	80	6,400	65	2,650	25
4.0		6,400	370	6,400	460	6,400	460	6,000	320	4,200	180	3,000	110	3,600	80	1,500	35
6.0		4,600	450	4,600	560	4,600	560	4,300	400	3,000	210	2,200	130	2,700	100	1,100	40
8.0		3,400	450	3,400	560	3,400	560	3,200	400	2,200	210	1,600	130	2,000	100	800	40
10.0		2,800	450	2,800	560	2,800	560	2,600	400	1,800	210	1,300	130	1,600	100	650	40
12.0		2,300	450	2,300	560	2,300	560	2,200	400	1,500	210	1,100	130	1,300	100	500	40
16.0		1,700	360	1,700	450	1,700	450	1,600	320	1,100	180	800	100	1,000	80	400	35
20.0		1,350	300	1,350	380	1,350	380	1,300	280	900	160	650	90	800	70	320	30
25.0		1,080	240	1,080	304	1,080	304	1,040	224	720	128	520	72	640	56	256	24
Standard Depth of Cut	ap	0.2DC		0.5DC						0.2DC		0.05DC		0.2DC			

GSX 20000S-2D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

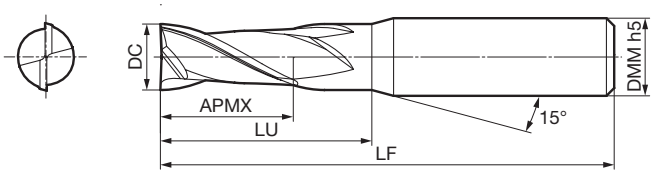
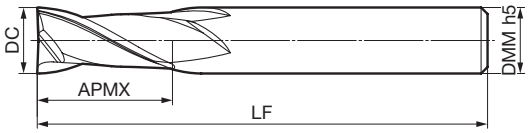


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body (Diameter ø0.3 to 4.3mm)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20030S-2D	●	**0.3**	0.6	1.0	40	4	1
20040S-2D	●	**0.4**	0.8	1.2	40	4	1
20050S-2D	●	**0.5**	1.3	1.7	40	4	1
20060S-2D	●	**0.6**	1.3	1.8	40	4	1
20070S-2D	●	**0.7**	1.4	1.9	40	4	1
GSX 20080S-2D	●	**0.8**	1.6	2.1	40	4	1
20090S-2D	●	**0.9**	1.8	2.3	40	4	1
20100S-2D	●	**1.0**	2.5	3.5	40	4	1
20110S-2D	●	**1.1**	2.5	3.5	40	4	1
20120S-2D	●	**1.2**	2.5	3.5	40	4	1
GSX 20130S-2D	●	**1.3**	2.6	3.6	40	4	1
20140S-2D	●	**1.4**	2.8	3.8	40	4	1
20150S-2D	●	**1.5**	3.8	4.8	40	4	1
20150S-2D-S3	●	**1.5**	3.8	4.8	38	3	1
20160S-2D	●	**1.6**	3.8	4.8	40	4	1
GSX 20170S-2D	●	**1.7**	3.8	4.8	40	4	1
20180S-2D	●	**1.8**	3.8	4.8	40	4	1
20190S-2D	●	**1.9**	3.8	4.8	40	4	1
20200S-2D	●	**2.0**	5.0	6.0	40	4	1
20200S-2D-S3	●	**2.0**	5.0	6.0	38	3	1
GSX 20210S-2D	●	**2.1**	6.0	7.0	40	4	1
20220S-2D	●	**2.2**	6.0	7.0	40	4	1
20230S-2D	●	**2.3**	6.0	7.0	40	4	1
20240S-2D	●	**2.4**	6.0	7.0	40	4	1
20250S-2D	●	**2.5**	6.3	7.3	40	4	1
GSX 20260S-2D	●	**2.6**	7.0	8.0	40	4	1
20270S-2D	●	**2.7**	7.0	8.0	40	4	1
20280S-2D	●	**2.8**	7.0	8.0	40	4	1
20290S-2D	●	**2.9**	7.0	8.0	40	4	1
20300S-2D	●	**3.0**	7.5	9.0	45	6	1
GSX 20300S-2D-S3	●	**3.0**	7.5	—	38	3	2
20310S-2D	●	**3.1**	7.5	9.0	45	6	1
20320S-2D	●	**3.2**	7.5	9.0	45	6	1
20330S-2D	●	**3.3**	7.5	9.0	45	6	1
20340S-2D	●	**3.4**	7.5	9.0	45	6	1
GSX 20350S-2D	●	**3.5**	8.8	10.3	45	6	1
20360S-2D	●	**3.6**	8.8	10.3	45	6	1
20370S-2D	●	**3.7**	8.8	10.3	45	6	1
20380S-2D	●	**3.8**	8.8	10.3	45	6	1
20390S-2D	●	**3.9**	8.8	10.3	45	6	1
GSX 20400S-2D	●	**4.0**	11.0	14.0	45	6	1
20400S-2D-S4	●	**4.0**	11.0	—	45	4	2
20410S-2D	●	**4.1**	11.0	14.0	45	6	1
20420S-2D	●	**4.2**	11.0	14.0	45	6	1
20430S-2D	●	**4.3**	11.0	14.0	45	6	1

Grade: ACF20

GSX 20000S-2D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

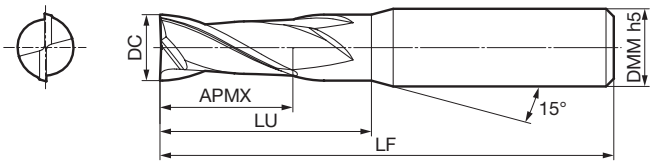
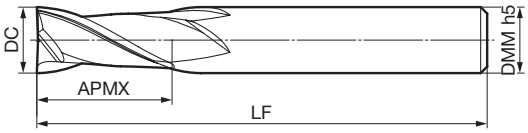


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body (Diameter ø4.4 to 8.8mm)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20440S-2D	●	**4.4**	11.0	14.0	45	6	1
20450S-2D	●	**4.5**	11.3	12.8	50	6	1
20460S-2D	●	**4.6**	11.3	12.8	50	6	1
20470S-2D	●	**4.7**	11.3	12.8	50	6	1
20480S-2D	●	**4.8**	11.3	12.8	50	6	1
GSX 20490S-2D	●	**4.9**	11.3	12.8	50	6	1
20500S-2D	●	**5.0**	13.0	19.6	50	6	1
20510S-2D	●	**5.1**	13.0	19.6	50	6	1
20520S-2D	●	**5.2**	13.0	19.6	50	6	1
20530S-2D	●	**5.3**	13.0	19.6	50	6	1
GSX 20540S-2D	●	**5.4**	13.0	19.6	50	6	1
20550S-2D	●	**5.5**	13.0	19.6	50	6	1
20560S-2D	●	**5.6**	13.0	19.6	50	6	1
20570S-2D	●	**5.7**	13.0	19.6	50	6	1
20580S-2D	●	**5.8**	13.0	19.6	50	6	1
GSX 20590S-2D	●	**5.9**	13.0	19.6	50	6	1
20600S-2D	●	**6.0**	13.0	—	50	6	2
20610S-2D	●	**6.1**	13.0	19.6	50	8	1
20620S-2D	●	**6.2**	13.0	19.6	50	8	1
20630S-2D	●	**6.3**	13.0	19.6	50	8	1
GSX 20640S-2D	●	**6.4**	13.0	19.6	50	8	1
20650S-2D	●	**6.5**	13.0	19.6	60	8	1
20660S-2D	●	**6.6**	13.2	19.8	60	8	1
20670S-2D	●	**6.7**	13.4	20.0	60	8	1
20680S-2D	●	**6.8**	13.6	20.2	60	8	1
GSX 20690S-2D	●	**6.9**	13.8	20.4	60	8	1
20700S-2D	●	**7.0**	16.0	21.1	60	8	1
20710S-2D	●	**7.1**	16.0	21.1	60	8	1
20720S-2D	●	**7.2**	16.0	21.1	60	8	1
20730S-2D	●	**7.3**	16.0	21.1	60	8	1
GSX 20740S-2D	●	**7.4**	16.0	21.1	60	8	1
20750S-2D	●	**7.5**	16.0	21.1	60	8	1
20760S-2D	●	**7.6**	16.0	21.1	60	8	1
20770S-2D	●	**7.7**	16.0	21.1	60	8	1
20780S-2D	●	**7.8**	16.0	21.1	60	8	1
GSX 20790S-2D	●	**7.9**	16.0	21.1	60	8	1
20800S-2D	●	**8.0**	19.0	—	60	8	2
20810S-2D	●	**8.1**	19.0	24.1	60	10	1
20820S-2D	●	**8.2**	19.0	24.1	60	10	1
20830S-2D	●	**8.3**	19.0	24.1	60	10	1
GSX 20840S-2D	●	**8.4**	19.0	24.1	60	10	1
20850S-2D	●	**8.5**	19.0	24.1	70	10	1
20860S-2D	●	**8.6**	19.0	24.1	70	10	1
20870S-2D	●	**8.7**	19.0	24.1	70	10	1
20880S-2D	●	**8.8**	19.0	24.1	70	10	1

Grade: ACF20

GSX 20000S-2D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

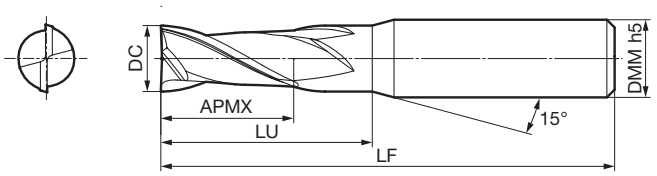
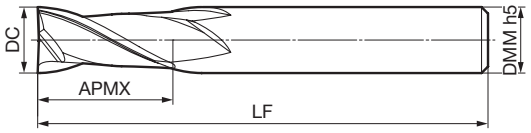


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body (Diameter ø8.9 to 25.0mm)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20890S-2D	●	**8.9**	19.0	24.1	70	10	1
20900S-2D	●	**9.0**	19.0	24.1	70	10	1
20910S-2D	●	**9.1**	19.0	24.1	70	10	1
20920S-2D	●	**9.2**	19.0	24.1	70	10	1
20930S-2D	●	**9.3**	19.0	24.1	70	10	1
GSX 20940S-2D	●	**9.4**	19.0	24.1	70	10	1
20950S-2D	●	**9.5**	20.0	25.1	70	10	1
20960S-2D	●	**9.6**	20.0	25.1	70	10	1
20970S-2D	●	**9.7**	20.0	25.1	70	10	1
20980S-2D	●	**9.8**	20.0	25.1	70	10	1
GSX 20990S-2D	●	**9.9**	20.0	25.1	70	10	1
21000S-2D	●	**10.0**	22.0	—	70	10	2
21050S-2D	●	**10.5**	22.0	24.5	75	12	1
21100S-2D	●	**11.0**	22.0	24.5	75	12	1
21150S-2D	●	**11.5**	23.0	25.5	75	12	1
GSX 21200S-2D	●	**12.0**	26.0	—	75	12	2
21250S-2D	●	**12.5**	26.0	29.5	75	16	1
21300S-2D	●	**13.0**	26.0	29.5	90	16	1
21400S-2D	●	**14.0**	28.0	31.5	90	16	1
21500S-2D	●	**15.0**	30.0	33.5	90	16	1
GSX 21600S-2D	●	**16.0**	32.0	—	90	16	2
21700S-2D	●	**17.0**	35.0	39.5	100	20	1
21800S-2D	●	**18.0**	40.0	44.5	100	20	1
21900S-2D	●	**19.0**	40.0	44.5	100	20	1
22000S-2D	●	**20.0**	40.0	—	100	20	2
GSX 22100S-2D	●	**21.0**	42.0	47.0	110	25	1
22200S-2D	●	**22.0**	44.0	49.0	110	25	1
22300S-2D	●	**23.0**	46.0	51.0	120	25	1
22400S-2D	●	**24.0**	48.0	53.0	120	25	1
22500S-2D	●	**25.0**	50.0	—	120	25	2

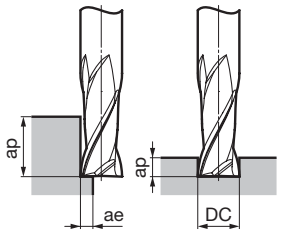
Grade: ACF20

Identification Code

GSX 2 0150 S - 2D - S3

Series Code	No. of Flutes	Dia.	Corner Style S: Sharp Edge	Cutting Edge Length	Shank Dia.

GSX 20000S-2D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. This series is not recommended for groove milling.
6. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		16,600	180	16,600	180	16,600	180	15,500	130	10,500	70	7,500	45	9,400	50	7,500	35
2.0		9,500	250	9,500	250	9,500	250	9,000	200	6,200	100	4,500	60	5,400	70	4,500	50
4.0		5,400	330	5,400	330	5,400	330	5,000	250	3,400	120	2,500	75	3,000	90	2,500	65
6.0		4,000	400	4,000	400	4,000	400	3,700	300	2,550	150	1,900	100	2,300	110	1,900	80
8.0		3,000	400	3,000	400	3,000	400	2,800	300	1,900	150	1,400	100	1,700	110	1,400	80
10.0		2,400	400	2,400	400	2,400	400	2,200	300	1,500	150	1,100	100	1,300	110	1,100	80
12.0		2,000	400	2,000	400	2,000	400	1,850	300	1,300	150	950	100	1,100	110	950	80
16.0		1,500	330	1,500	330	1,500	330	1,400	250	950	120	700	75	850	85	700	60
20.0		1,200	280	1,200	280	1,200	280	1,100	220	750	110	550	65	650	75	550	55
25.0		960	220	960	220	960	220	880	170	600	85	440	50	520	60	440	45
Standard Depth of Cut	ap	2.0DC															
	ae	0.02DC										0.01DC					

Groove Finishing

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		16,600	180	16,600	180	16,600	180	15,500	130	10,500	70	7,500	45	9,400	50	7,500	35
2.0		9,500	250	9,500	250	9,500	250	9,000	200	6,200	100	4,500	60	5,400	70	4,500	50
4.0		5,400	330	5,400	330	5,400	330	5,000	250	3,400	120	2,500	75	3,000	90	2,500	65
6.0		4,000	400	4,000	400	4,000	400	3,700	300	2,550	150	1,900	100	2,300	110	1,900	80
8.0		3,000	400	3,000	400	3,000	400	2,800	300	1,900	150	1,400	100	1,700	110	1,400	80
10.0		2,400	400	2,400	400	2,400	400	2,200	300	1,500	150	1,100	100	1,300	110	1,100	80
12.0		2,000	400	2,000	400	2,000	400	1,850	300	1,300	150	950	100	1,100	110	950	80
16.0		1,500	330	1,500	330	1,500	330	1,400	250	950	120	700	75	850	85	700	60
20.0		1,200	280	1,200	280	1,200	280	1,100	220	750	110	550	65	650	75	550	55
25.0		960	220	960	220	960	220	880	170	600	85	440	50	520	60	440	45
Standard Depth of Cut	ap	1.5DC															
	ae	Below 0.02DC															

GSX 20000C-2D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing | Helical Milling | Ramping

Fig 1

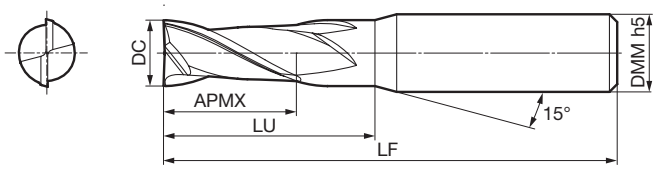
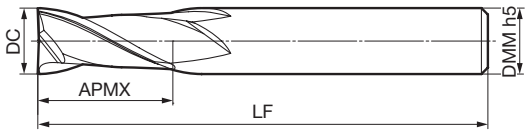


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20050C-2D	●	**0.5**	1.0	1.4	40	4	1
20100C-2D	●	**1.0**	2.0	3.0	40	4	1
20150C-2D	●	**1.5**	3.0	4.0	40	4	1
20200C-2D	●	**2.0**	4.0	5.0	40	4	1
20250C-2D	●	**2.5**	5.0	6.0	40	4	1
GSX 20300C-2D	●	**3.0**	6.0	7.5	45	6	1
20350C-2D	●	**3.5**	7.0	8.5	45	6	1
20400C-2D	●	**4.0**	8.0	9.5	45	6	1
20450C-2D	●	**4.5**	9.0	10.5	50	6	1
20500C-2D	●	**5.0**	10.0	12.0	50	6	1
GSX 20550C-2D	●	**5.5**	11.0	13.0	50	6	1
20600C-2D	●	**6.0**	12.0	—	50	6	2
20650C-2D	●	**6.5**	13.0	15.0	60	8	1
20700C-2D	●	**7.0**	14.0	16.0	60	8	1
20750C-2D	●	**7.5**	15.0	17.0	60	8	1
GSX 20800C-2D	●	**8.0**	16.0	—	60	8	2
20850C-2D	●	**8.5**	17.0	19.0	70	10	1
20900C-2D	●	**9.0**	18.0	20.0	70	10	1
20950C-2D	●	**9.5**	19.0	21.0	70	10	1
21000C-2D	●	**10.0**	20.0	—	70	10	2
GSX 21050C-2D	●	**10.5**	21.0	23.5	75	12	1
21100C-2D	●	**11.0**	22.0	24.5	75	12	1
21150C-2D	●	**11.5**	23.0	25.5	75	12	1
21200C-2D	●	**12.0**	24.0	—	75	12	2
21300C-2D	●	**13.0**	26.0	29.5	90	16	1
GSX 21400C-2D	●	**14.0**	28.0	31.5	90	16	1
21500C-2D	●	**15.0**	30.0	33.5	90	16	1
21600C-2D	●	**16.0**	32.0	—	90	16	2
21700C-2D	●	**17.0**	34.0	38.5	100	20	1
21800C-2D	●	**18.0**	36.0	40.5	100	20	1
GSX 21900C-2D	●	**19.0**	38.0	42.5	100	20	1
22000C-2D	●	**20.0**	40.0	—	100	20	2
22500C-2D	●	**25.0**	50.0	—	120	25	2

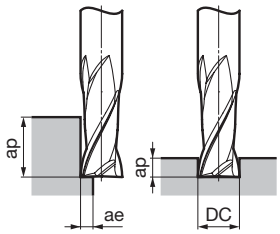
Grade: ACF20

Identification Code

GSX 2 0050 C - 2D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 20000C-2D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
Dc (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		19,600	250	19,600	250	19,600	250	18,300	180	12,700	100	9,000	60	11,000	70	9,000	50
2.0		11,200	340	11,200	340	11,200	340	10,500	240	7,300	130	5,300	80	6,400	90	5,300	70
4.0		6,400	460	6,400	460	6,400	460	6,000	320	4,200	180	3,000	110	3,600	120	3,000	90
6.0		4,600	560	4,600	560	4,600	560	4,300	400	3,000	210	2,200	130	2,700	140	2,200	100
8.0		3,400	560	3,400	560	3,400	560	3,200	400	2,200	210	1,600	130	2,000	140	1,600	100
10.0		2,800	560	2,800	560	2,800	560	2,600	400	1,800	210	1,300	130	1,600	140	1,300	100
12.0		2,300	560	2,300	560	2,300	560	2,200	400	1,500	210	1,100	130	1,300	140	1,100	100
16.0		1,700	450	1,700	450	1,700	450	1,600	320	1,100	180	800	100	1,000	110	800	85
20.0		1,350	380	1,350	380	1,350	380	1,300	280	900	160	650	90	800	100	650	75
25.0		1,000	300	1,000	300	1,000	300	1,000	220	700	120	500	70	640	80	500	60
Standard Depth of Cut	ap	1.5DC										1.0DC					
	ae	0.05DC										0.02DC					

Groove Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC(mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		19,600	200	19,600	250	19,600	250	18,300	180	12,700	100	9,000	60	11,000	50	4,500	20
2.0		11,200	270	11,200	340	11,200	340	10,500	240	7,300	130	5,300	80	6,400	65	2,650	25
4.0		6,400	370	6,400	460	6,400	460	6,000	320	4,200	180	3,000	110	3,600	80	1,500	35
6.0		4,600	450	4,600	560	4,600	560	4,300	400	3,000	210	2,200	130	2,700	100	1,100	40
8.0		3,400	450	3,400	560	3,400	560	3,200	400	2,200	210	1,600	130	2,000	100	800	40
10.0		2,800	450	2,800	560	2,800	560	2,600	400	1,800	210	1,300	130	1,600	100	650	40
12.0		2,300	450	2,300	560	2,300	560	2,200	400	1,500	210	1,100	130	1,300	100	500	40
16.0		1,700	360	1,700	450	1,700	450	1,600	320	1,100	180	800	100	1,000	80	400	35
20.0		1,350	300	1,350	380	1,350	380	1,300	280	900	160	650	90	800	70	320	30
25.0		1,000	240	1,000	300	1,000	300	1,000	220	700	120	500	70	640	55	250	25
Standard Depth of Cut	ap	0.2DC		0.5DC						0.2DC		0.05DC		0.2DC			

GSX 20000S-3D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

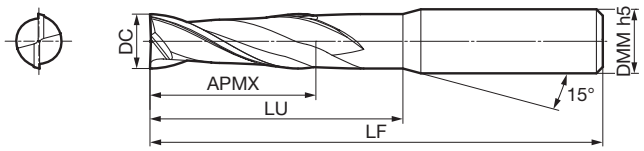
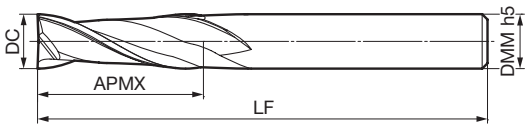


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20050S-3D	●	**0.5**	1.5	1.9	40	4	1
20100S-3D	●	**1.0**	3.0	4.0	40	4	1
20150S-3D	●	**1.5**	4.5	5.5	40	4	1
20200S-3D	●	**2.0**	6.0	7.0	40	4	1
20250S-3D	●	**2.5**	7.5	8.5	40	4	1
GSX 20260S-3D	●	**2.6**	8.0	9.5	50	4	1
20270S-3D	●	**2.7**	8.5	10.0	50	4	1
20280S-3D	●	**2.8**	9.0	10.5	50	4	1
20290S-3D	●	**2.9**	9.0	10.5	50	4	1
20300S-3D	●	**3.0**	9.0	10.5	50	6	1
GSX 20350S-3D	●	**3.5**	12.0	13.5	50	6	1
20400S-3D	●	**4.0**	12.0	13.5	50	6	1
20450S-3D	●	**4.5**	15.0	16.5	50	6	1
20500S-3D	●	**5.0**	15.0	17.0	50	6	1
20550S-3D	●	**5.5**	18.0	20.0	50	6	1
GSX 20600S-3D	●	**6.0**	18.0	—	50	6	2
20650S-3D	●	**6.5**	20.0	22.0	70	8	1
20700S-3D	●	**7.0**	21.0	23.0	70	8	1
20750S-3D	●	**7.5**	23.0	25.0	70	8	1
20800S-3D	●	**8.0**	24.0	—	70	8	2
GSX 20850S-3D	●	**8.5**	26.0	28.0	75	10	1
20900S-3D	●	**9.0**	27.0	29.0	75	10	1
20950S-3D	●	**9.5**	29.0	31.0	75	10	1
21000S-3D	●	**10.0**	30.0	—	90	10	2
21050S-3D	●	**10.5**	32.0	34.5	90	12	1
GSX 21100S-3D	●	**11.0**	33.0	35.5	90	12	1
21150S-3D	●	**11.5**	35.0	37.5	90	12	1
21200S-3D	●	**12.0**	36.0	—	90	12	2
21300S-3D	●	**13.0**	39.0	42.5	100	16	1
21400S-3D	●	**14.0**	42.0	45.5	110	16	1
GSX 21500S-3D	●	**15.0**	45.0	48.5	110	16	1
21600S-3D	●	**16.0**	48.0	—	110	16	2
21700S-3D	●	**17.0**	51.0	55.5	110	20	1
21800S-3D	●	**18.0**	54.0	58.5	120	20	1
21900S-3D	●	**19.0**	57.0	61.5	120	20	1
GSX 22000S-3D	●	**20.0**	60.0	—	120	20	2
22400S-3D	●	**24.0**	72.0	77.0	130	25	1
22500S-3D	●	**25.0**	75.0	—	130	25	2

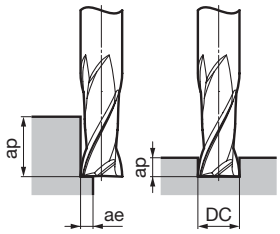
Grade: ACF20

Identification Code

GSX 2 0050 S - 3D

Series Code	No. of Flutes	Dia.	Corner Style S: Sharp Edge	Cutting Edge Length

GSX 20000S-3D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. This series is not recommended for groove milling.
6. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		14,000	140	14,000	140	14,000	140	13,200	100	8,900	50	6,300	30	8,000	35	6,300	25
2.0		8,100	180	8,100	180	8,100	180	7,600	150	5,300	90	3,700	45	4,400	50	3,800	40
4.0		4,400	240	4,400	240	4,400	240	4,000	150	2,900	110	1,900	55	2,200	65	1,900	50
6.0		2,900	260	2,900	260	2,900	260	2,700	180	2,100	130	1,200	65	1,400	75	1,200	60
8.0		2,200	230	2,200	230	2,200	230	2,000	180	1,600	130	900	65	1,100	75	900	60
10.0		1,800	220	1,800	220	1,800	220	1,600	170	1,300	130	750	65	850	75	750	60
12.0		1,500	200	1,500	200	1,500	200	1,300	170	1,000	130	630	65	700	75	600	60
16.0		1,100	170	1,100	170	1,100	170	1,000	150	800	110	450	55	550	65	450	50
20.0		850	160	850	160	850	160	800	130	600	100	350	50	400	55	350	45
25.0		680	130	680	130	680	130	640	100	480	80	280	40	320	45	280	35
Standard Depth of Cut	ap	2.5DC								2.0DC							
	ae	Below ø3: 0.02DC Above ø3: 0.05DC								0.01DC							

Groove Finishing

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		14,000	140	14,000	140	14,000	140	13,200	100	8,900	50	6,300	30	8,000	35	6,300	25
2.0		8,100	180	8,100	180	8,100	180	7,600	150	5,300	90	3,700	45	4,400	50	3,800	40
4.0		4,400	240	4,400	240	4,400	240	4,000	150	2,900	110	1,900	55	2,200	65	1,900	50
6.0		2,900	260	2,900	260	2,900	260	2,700	180	2,100	130	1,200	65	1,400	75	1,200	60
8.0		2,200	230	2,200	230	2,200	230	2,000	180	1,600	130	900	65	1,100	75	900	60
10.0		1,800	220	1,800	220	1,800	220	1,600	170	1,300	130	750	65	850	75	750	60
12.0		1,500	200	1,500	200	1,500	200	1,300	170	1,000	130	630	65	700	75	600	60
16.0		1,100	170	1,100	170	1,100	170	1,000	150	800	110	450	55	550	65	450	50
20.0		850	160	850	160	850	160	800	130	600	100	350	50	400	55	350	45
25.0		680	130	680	130	680	130	640	100	480	80	280	40	320	45	280	35
Standard Depth of Cut	ap	1.5DC															
	ae	Below 0.02DC															

GSX 20000C-3D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing

Fig 1

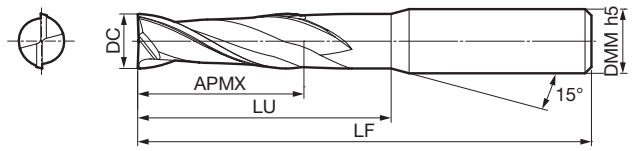
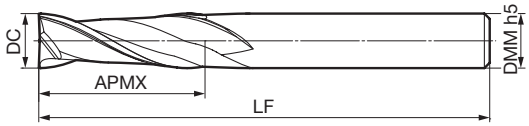


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20050C-3D	●	**0.5**	1.5	1.9	40	4	1
20100C-3D	●	**1.0**	3.0	4.0	40	4	1
20150C-3D	●	**1.5**	4.5	5.5	40	4	1
20200C-3D	●	**2.0**	6.0	7.0	40	4	1
20250C-3D	●	**2.5**	7.5	8.5	40	4	1
GSX 20300C-3D	●	**3.0**	9.0	10.5	50	6	1
20350C-3D	●	**3.5**	11.0	12.5	50	6	1
20400C-3D	●	**4.0**	12.0	13.5	50	6	1
20450C-3D	●	**4.5**	14.0	15.5	50	6	1
20500C-3D	●	**5.0**	15.0	17.0	50	6	1
GSX 20550C-3D	●	**5.5**	17.0	19.0	50	6	1
20600C-3D	●	**6.0**	18.0	—	50	6	2
20650C-3D	●	**6.5**	20.0	22.0	70	8	1
20700C-3D	●	**7.0**	21.0	23.0	70	8	1
20750C-3D	●	**7.5**	23.0	25.0	70	8	1
GSX 20800C-3D	●	**8.0**	24.0	—	70	8	2
20850C-3D	●	**8.5**	26.0	28.0	75	10	1
20900C-3D	●	**9.0**	27.0	29.0	75	10	1
20950C-3D	●	**9.5**	29.0	31.0	75	10	1
21000C-3D	●	**10.0**	30.0	—	90	10	2
GSX 21050C-3D	●	**10.5**	32.0	34.5	90	12	1
21100C-3D	●	**11.0**	33.0	35.5	90	12	1
21150C-3D	●	**11.5**	35.0	37.5	90	12	1
21200C-3D	●	**12.0**	36.0	—	90	12	2
21300C-3D	●	**13.0**	39.0	42.5	100	16	1
GSX 21400C-3D	●	**14.0**	42.0	45.5	110	16	1
21500C-3D	●	**15.0**	45.0	48.5	110	16	1
21600C-3D	●	**16.0**	48.0	—	110	16	2
21700C-3D	●	**17.0**	51.0	55.5	110	20	1
21800C-3D	●	**18.0**	54.0	58.5	120	20	1
GSX 21900C-3D	●	**19.0**	57.0	61.5	120	20	1
22000C-3D	●	**20.0**	60.0	—	120	20	2
22500C-3D	●	**25.0**	75.0	—	130	25	2

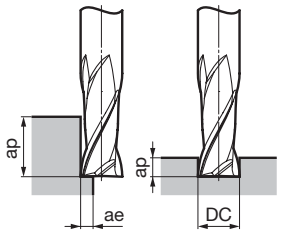
Grade: ACF20

Identification Code

GSX 2 0100 C - 3D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 20000C-3D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. In some cases, chattering may occur in early stages of milling but will cease after 2m of cutting.
5. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		16,600	190	16,600	190	16,600	190	15,500	140	10,500	70	7,500	45	9,400	50	7,500	35
2.0		9,500	250	9,500	250	9,500	250	9,000	200	6,200	120	4,500	60	5,200	70	4,500	50
4.0		5,200	330	5,200	330	5,200	330	4,800	200	3,400	150	2,250	75	2,600	90	2,250	65
6.0		3,500	360	3,500	360	3,500	360	3,200	250	2,550	170	1,500	90	1,700	100	1,500	80
8.0		2,600	320	2,600	320	2,600	320	2,400	240	1,900	170	1,100	90	1,300	100	1,100	80
10.0		2,100	300	2,100	300	2,100	300	1,900	230	1,500	170	900	90	1,000	100	900	80
12.0		1,750	280	1,750	280	1,750	280	1,600	230	1,250	170	750	90	850	100	750	80
16.0		1,300	240	1,300	240	1,300	240	1,200	200	950	150	550	75	650	85	550	65
20.0		1,050	220	1,050	220	1,050	220	950	180	750	140	450	70	500	75	450	60
25.0		840	180	840	180	840	180	760	140	600	110	360	55	400	60	360	45
Standard Depth of Cut	ap	2.5DC								2.0DC							
	ae	Below ø3: 0.05DC Above ø3: 0.1DC								0.02DC							

Groove Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		16,600	70	16,600	80	16,600	80	15,500	50	10,500	50	7,500	35	9,400	30	3,750	10
2.0		9,500	80	9,500	100	9,500	100	9,000	90	6,200	60	4,500	45	5,200	40	2,250	15
4.0		5,200	120	5,200	150	5,200	150	4,800	120	3,400	80	2,200	50	2,600	50	1,250	20
6.0		3,500	140	3,500	170	3,500	170	3,200	130	2,550	100	1,500	50	1,700	60	950	25
8.0		2,600	140	2,600	160	2,600	160	2,400	130	1,900	100	1,100	50	1,300	60	700	25
10.0		2,100	130	2,100	150	2,100	150	1,900	120	1,500	90	900	50	1,000	60	550	25
12.0		1,750	130	1,750	150	1,750	150	1,600	120	1,250	90	750	50	850	60	450	25
16.0		1,300	110	1,300	130	1,300	130	1,200	110	950	80	550	45	650	50	350	20
20.0		1,050	100	1,050	120	1,050	120	950	100	750	70	450	40	500	40	280	15
25.0		840	80	840	96	840	96	760	80	600	56	360	32	400	32	224	12
Standard Depth of Cut	ap	0.1DC		0.2DC								0.05DC		0.1DC			

GSX 20000S-4D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

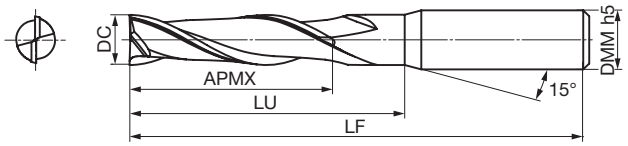
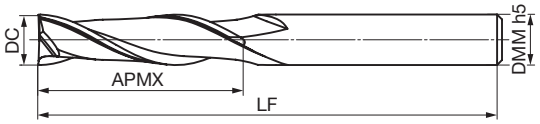


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20050S-4D	●	**0.5**	2.0	2.4	40	4	1
20100S-4D	●	**1.0**	5.0	6.0	40	4	1
20150S-4D	●	**1.5**	7.0	8.0	40	4	1
20200S-4D	●	**2.0**	9.0	10.0	40	4	1
20250S-4D	●	**2.5**	12.0	13.0	50	4	1
GSX 20300S-4D	●	**3.0**	12.0	13.5	50	6	1
20350S-4D	●	**3.5**	14.0	15.5	50	6	1
20400S-4D	●	**4.0**	16.0	17.5	50	6	1
20450S-4D	●	**4.5**	18.0	19.5	60	6	1
20500S-4D	●	**5.0**	20.0	22.0	60	6	1
GSX 20550S-4D	●	**5.5**	22.0	24.0	60	6	1
20600S-4D	●	**6.0**	24.0	—	60	6	2
20650S-4D	●	**6.5**	26.0	28.0	70	8	1
20700S-4D	●	**7.0**	28.0	30.0	80	8	1
20750S-4D	●	**7.5**	30.0	32.0	80	8	1
GSX 20800S-4D	●	**8.0**	32.0	—	80	8	2
20850S-4D	●	**8.5**	34.0	36.0	90	10	1
20900S-4D	●	**9.0**	36.0	38.0	90	10	1
20950S-4D	●	**9.5**	38.0	40.0	90	10	1
21000S-4D	●	**10.0**	40.0	—	90	10	2
GSX 21050S-4D	●	**10.5**	42.0	44.5	100	12	1
21100S-4D	●	**11.0**	44.0	46.5	100	12	1
21150S-4D	●	**11.5**	46.0	48.5	100	12	1
21200S-4D	●	**12.0**	48.0	—	100	12	2
21300S-4D	●	**13.0**	52.0	55.5	110	16	1
GSX 21400S-4D	●	**14.0**	56.0	59.5	110	16	1
21500S-4D	●	**15.0**	60.0	63.5	120	16	1
21600S-4D	●	**16.0**	64.0	—	120	16	2
21700S-4D	●	**17.0**	68.0	72.5	130	20	1
21800S-4D	●	**18.0**	72.0	76.5	130	20	1
GSX 21900S-4D	●	**19.0**	76.0	80.5	140	20	1
22000S-4D	●	**20.0**	80.0	—	140	20	2
22500S-4D	●	**25.0**	100.0	—	160	25	2

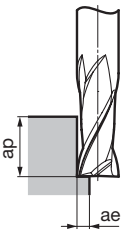
Grade: ACF20

Identification Code

GSX 2 0100 S - 4D

Series Code	No. of Flutes	Dia.	Corner Style S: Sharp Edge	Cutting Edge Length

GSX 20000S-4D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. This series is not recommended for groove milling.
6. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		7,600	110	7,600	110	7,600	110	6,000	80	5,500	40	3,800	25	4,600	35	3,800	20
2.0		3,850	150	3,850	150	3,850	150	2,950	100	2,750	60	1,900	30	2,300	40	1,950	30
4.0		1,900	200	1,900	200	1,900	200	1,450	130	1,350	80	1,000	50	1,150	55	1,000	35
6.0		1,250	250	1,250	250	1,250	250	970	140	860	90	640	60	740	60	640	40
8.0		930	220	930	220	930	220	700	140	670	90	500	60	560	60	490	40
10.0		770	210	770	210	770	210	190	130	560	95	380	60	460	60	380	40
12.0		650	200	650	200	650	200	470	130	420	85	330	60	370	60	320	40
16.0		450	170	450	170	450	170	370	120	340	80	250	45	280	50	250	35
20.0		360	140	360	140	360	140	300	100	260	70	190	35	220	40	190	30
25.0		190	120	190	120	190	120	230	80	200	55	150	30	170	30	150	25
Standard Depth of Cut	ap	2.5DC								2.0DC							
	ae	Below ø3: 0.02DC Above ø3: 0.05DC								0.01DC							

GSX 20000C-4D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling | Spot Facing

Fig 1

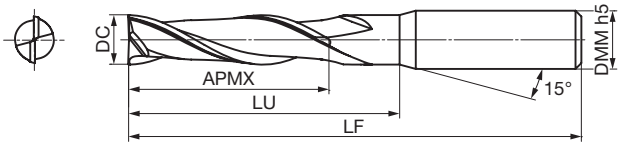
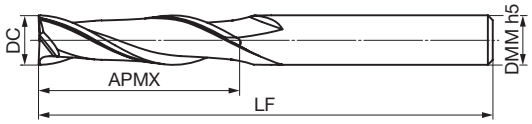


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 20050C-4D	●	**0.5**	2.0	2.4	40	4	1
20100C-4D	●	**1.0**	4.0	5.0	40	4	1
20150C-4D	●	**1.5**	6.0	7.0	40	4	1
20200C-4D	●	**2.0**	8.0	9.0	40	4	1
20250C-4D	●	**2.5**	10.0	11.0	50	4	1
GSX 20300C-4D	●	**3.0**	12.0	13.5	50	6	1
20350C-4D	●	**3.5**	14.0	15.5	50	6	1
20400C-4D	●	**4.0**	16.0	17.5	50	6	1
20450C-4D	●	**4.5**	18.0	19.5	60	6	1
20500C-4D	●	**5.0**	20.0	22.0	60	6	1
GSX 20550C-4D	●	**5.5**	22.0	24.0	60	6	1
20600C-4D	●	**6.0**	24.0	—	60	6	2
20650C-4D	●	**6.5**	26.0	28.0	70	8	1
20700C-4D	●	**7.0**	28.0	30.0	80	8	1
20750C-4D	●	**7.5**	30.0	32.0	80	8	1
GSX 20800C-4D	●	**8.0**	32.0	—	80	8	2
20850C-4D	●	**8.5**	34.0	36.0	90	10	1
20900C-4D	●	**9.0**	36.0	38.0	90	10	1
20950C-4D	●	**9.5**	38.0	40.0	90	10	1
21000C-4D	●	**10.0**	40.0	—	90	10	2
GSX 21050C-4D	●	**10.5**	42.0	44.5	100	12	1
21100C-4D	●	**11.0**	44.0	46.5	100	12	1
21150C-4D	●	**11.5**	46.0	48.5	100	12	1
21200C-4D	●	**12.0**	48.0	—	100	12	2
21300C-4D	●	**13.0**	52.0	55.5	110	16	1
GSX 21400C-4D	●	**14.0**	56.0	59.5	110	16	1
21500C-4D	●	**15.0**	60.0	63.5	120	16	1
21600C-4D	●	**16.0**	64.0	—	120	16	2
21700C-4D	●	**17.0**	68.0	72.5	130	20	1
21800C-4D	●	**18.0**	72.0	76.5	130	20	1
GSX 21900C-4D	●	**19.0**	76.0	80.5	140	20	1
22000C-4D	●	**20.0**	80.0	—	140	20	2
22500C-4D	●	**25.0**	100.0	—	160	25	2

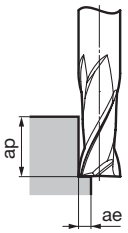
Grade: ACF20

Identification Code

GSX 2 0100 C - 4D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 20000C-4D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. In some cases, chattering may occur in early stages of milling but will cease after 2m of cutting.
5. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. This series is not recommended for groove milling.
7. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		9,000	130	9,000	130	9,000	130	7,000	95	6,500	50	4,500	30	5,400	40	4,500	25
2.0		4,500	180	4,500	180	4,500	180	3,500	120	3,200	70	2,300	40	2,700	50	2,300	35
4.0		2,250	240	2,250	240	2,250	240	1,750	160	1,600	95	1,200	60	1,350	65	1,200	40
6.0		1,500	300	1,500	300	1,500	300	1,150	170	1,050	110	800	70	900	70	800	50
8.0		1,100	260	1,100	260	1,100	260	850	170	800	110	600	70	660	70	600	50
10.0		900	250	900	250	900	250	700	160	650	110	460	70	540	70	460	50
12.0		750	240	750	240	750	240	580	160	520	110	400	70	450	70	400	50
16.0		550	200	550	200	550	200	440	140	400	95	300	55	330	60	300	45
20.0		450	180	450	180	450	180	350	120	320	85	240	45	270	50	240	40
25.0		360	140	360	140	360	140	280	95	250	65	190	35	210	40	192	30
Standard Depth of Cut	ap	3.5DC										3.0DC					
	ae	0.08DC						0.04DC									

GSX 30000C-1.5D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

3 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing | Helical Milling | Ramping

Fig 1

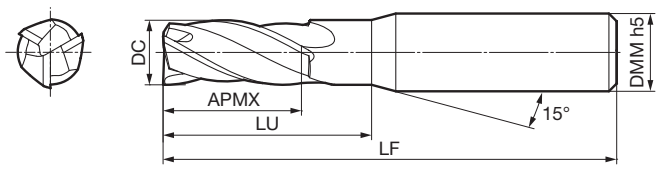
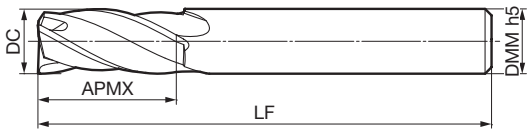


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 30100C-1.5D	●	**1.0**	1.5	2.5	40	4	1
30150C-1.5D	●	**1.5**	2.3	3.3	40	4	1
30200C-1.5D	●	**2.0**	3.0	4.0	40	4	1
30250C-1.5D	●	**2.5**	3.8	4.8	40	4	1
30300C-1.5D	●	**3.0**	4.5	6.0	45	6	1
GSX 30400C-1.5D	●	**4.0**	6.0	7.5	45	6	1
30500C-1.5D	●	**5.0**	7.5	9.5	50	6	1
30600C-1.5D	●	**6.0**	9.0	—	50	6	2
30700C-1.5D	●	**7.0**	11.0	13.0	60	8	1
30800C-1.5D	●	**8.0**	12.0	—	60	8	2
GSX 30900C-1.5D	●	**9.0**	14.0	16.0	70	10	1
31000C-1.5D	●	**10.0**	15.0	—	70	10	2
31200C-1.5D	●	**12.0**	18.0	—	75	12	2

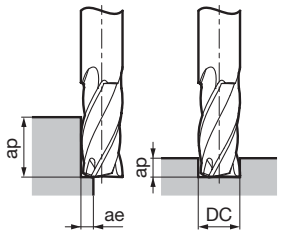
Grade: ACF20

Identification Code

GSX 3 0100 C - 1.5D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 30000C-1.5D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		19,600	300	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	90	9,000	65
2.0		11,200	410	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	120	5,300	90
4.0		6,400	550	6,400	550	6,400	550	6,000	370	4,200	230	3,000	140	3,600	150	3,000	120
6.0		4,600	670	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,700	180	2,200	130
8.0		3,400	670	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	180	1,600	130
10.0		2,800	670	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	180	1,300	130
12.0		2,300	670	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	180	1,100	130
Standard Depth of Cut	ap	1.5DC										1.0DC					
	ae	0.05DC										0.02DC					

Groove Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		19,600	240	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	65	4,500	25
2.0		11,200	320	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	85	2,650	35
4.0		6,400	450	6,400	550	6,400	550	6,000	370	4,200	230	3,000	140	3,600	100	1,500	50
6.0		4,600	540	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,650	130	1,150	55
8.0		3,400	540	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	130	800	55
10.0		2,800	540	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	130	650	55
12.0		2,300	540	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	130	500	55
Standard Depth of Cut	ap	0.2DC		0.5DC						0.2DC		0.05DC		0.2DC			

GSX 30000C-2D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

3 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing | Helical Milling | Ramping

Fig 1

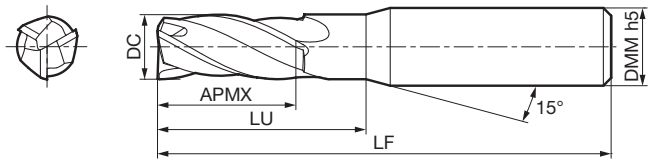
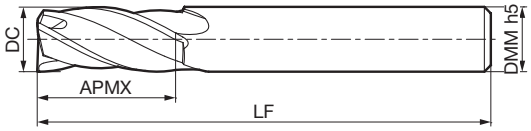


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 30100C-2D	●	**1.0**	2.5	3.5	40	4	1
30150C-2D	●	**1.5**	3.8	4.8	40	4	1
30200C-2D	●	**2.0**	5.0	6.0	40	4	1
30250C-2D	●	**2.5**	6.3	7.3	40	4	1
30300C-2D	●	**3.0**	7.5	9.0	45	6	1
GSX 30400C-2D	●	**4.0**	11.0	12.5	45	6	1
30500C-2D	●	**5.0**	13.0	15.0	50	6	1
30600C-2D	●	**6.0**	13.0	—	50	6	2
30700C-2D	●	**7.0**	16.0	18.0	60	8	1
30800C-2D	●	**8.0**	19.0	—	60	8	2
GSX 30900C-2D	●	**9.0**	19.0	21.0	70	10	1
31000C-2D	●	**10.0**	22.0	—	70	10	2
31200C-2D	●	**12.0**	26.0	—	75	12	2

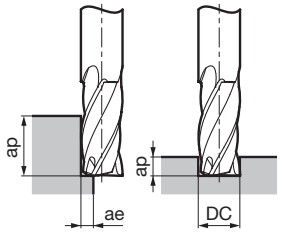
Grade: ACF20

Identification Code

GSX 3 0100 C - 2D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 30000C-2D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		19,600	300	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	90	9,000	65
2.0		11,200	410	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	120	5,300	90
4.0		6,400	550	6,400	550	6,400	550	6,000	370	4,200	230	3,000	140	3,600	150	3,000	120
6.0		4,600	670	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,700	180	2,200	130
8.0		3,400	670	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	180	1,600	130
10.0		2,800	670	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	180	1,300	130
12.0		2,300	670	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	180	1,100	130
Standard Depth of Cut	ap	1.5DC										1.0DC					
	ae	0.05DC										0.02DC					

Groove Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		19,600	240	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	65	4,500	25
2.0		11,200	320	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	85	2,650	35
4.0		6,400	450	6,400	550	6,400	550	6,000	370	4,200	230	3,000	140	3,600	100	1,500	50
6.0		4,600	540	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,650	130	1,150	55
8.0		3,400	540	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	130	800	55
10.0		2,800	540	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	130	650	55
12.0		2,300	540	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	130	500	55
Standard Depth of Cut	ap	0.2DC		0.5DC						0.2DC		0.05DC		0.2DC			

GSX 40000C-1.5D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping

Fig 1

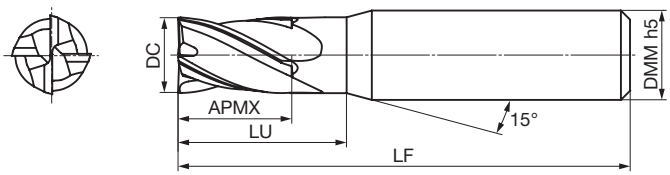
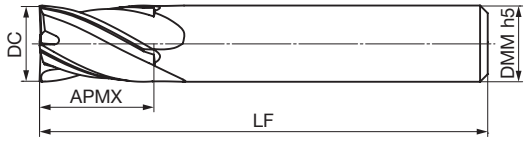


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 40100C-1.5D	●	**1.0**	1.5	2.5	40	4	1
40150C-1.5D	●	**1.5**	2.3	3.3	40	4	1
40200C-1.5D	●	**2.0**	3.0	4.0	40	4	1
40250C-1.5D	●	**2.5**	3.8	4.8	40	4	1
40300C-1.5D	●	**3.0**	4.5	6.0	45	6	1
GSX 40350C-1.5D	●	**3.5**	5.3	6.8	45	6	1
40400C-1.5D	●	**4.0**	6.0	7.5	45	6	1
40450C-1.5D	●	**4.5**	6.8	8.3	50	6	1
40500C-1.5D	●	**5.0**	7.5	9.5	50	6	1
40550C-1.5D	●	**5.5**	8.3	10.3	50	6	1
GSX 40600C-1.5D	●	**6.0**	9.0	—	50	6	2
40650C-1.5D	●	**6.5**	10.0	12.0	60	8	1
40700C-1.5D	●	**7.0**	11.0	13.0	60	8	1
40750C-1.5D	●	**7.5**	12.0	14.0	60	8	1
40800C-1.5D	●	**8.0**	12.0	—	60	8	2
GSX 40850C-1.5D	●	**8.5**	13.0	15.0	70	10	1
40900C-1.5D	●	**9.0**	14.0	16.0	70	10	1
40950C-1.5D	●	**9.5**	15.0	17.0	70	10	1
41000C-1.5D	●	**10.0**	15.0	—	70	10	2
41050C-1.5D	●	**10.5**	16.0	18.5	75	12	1
GSX 41100C-1.5D	●	**11.0**	17.0	19.5	75	12	1
41150C-1.5D	●	**11.5**	18.0	20.5	75	12	1
41200C-1.5D	●	**12.0**	18.0	—	75	12	2
41300C-1.5D	●	**13.0**	20.0	23.5	90	16	1
41400C-1.5D	●	**14.0**	21.0	24.5	90	16	1
GSX 41500C-1.5D	●	**15.0**	23.0	26.5	90	16	1
41600C-1.5D	●	**16.0**	24.0	—	90	16	2
41700C-1.5D	●	**17.0**	26.0	30.5	100	20	1
41800C-1.5D	●	**18.0**	27.0	31.5	100	20	1
41900C-1.5D	●	**19.0**	29.0	33.5	100	20	1
GSX 42000C-1.5D	●	**20.0**	30.0	—	100	20	2
42500C-1.5D	●	**25.0**	38.0	—	120	25	2

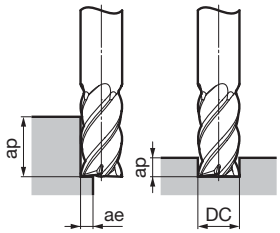
Grade: ACF20

Identification Code

GSX 4 0100 C - 1.5D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 40000C-1.5D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
1.0		24,000	470	24,000	470	24,000	470	21,000	290	14,500	180	10,500	120	12,600	120	10,500	85
2.0		12,800	570	12,800	570	12,800	570	12,000	380	8,300	230	6,000	150	7,200	160	6,000	110
4.0		6,800	730	6,800	730	6,800	730	6,400	490	4,400	300	3,200	200	3,800	210	3,200	130
6.0		4,600	780	4,600	780	4,600	780	4,300	520	3,000	320	2,200	210	2,650	220	2,200	150
8.0		3,400	780	3,400	780	3,400	780	3,200	520	2,200	320	1,600	210	2,000	220	1,600	150
10.0		2,800	780	2,800	780	2,800	780	2,600	520	1,800	320	1,300	210	1,500	220	1,300	150
12.0		2,300	780	2,300	780	2,300	780	2,200	520	1,500	320	1,100	210	1,300	220	1,100	150
16.0		1,700	650	1,700	650	1,700	650	1,600	420	1,100	280	800	170	1,000	180	800	120
20.0		1,350	600	1,350	600	1,350	600	1,300	380	900	260	650	150	800	160	650	100
25.0		1,050	470	1,050	470	1,050	470	1,050	300	720	210	520	120	640	130	520	80
Standard Depth of Cut	ap	1.5DC										1.0DC					
	ae	0.05DC										0.02DC					

Side Milling (Using High Speed Machining Centre)

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
1.0		60,000	1,200	60,000	1,200	60,000	1,200	60,000	850	60,000	720	48,000	500	32,000	300	—	—
2.0		47,800	2,200	47,800	2,200	47,800	2,200	47,800	1,600	39,800	1,200	31,800	900	15,900	400	—	—
4.0		23,900	2,600	23,900	2,600	23,900	2,600	23,900	1,900	19,900	1,400	15,900	1,100	8,000	490	—	—
6.0		16,000	2,700	16,000	2,700	16,000	2,700	16,000	2,000	13,300	1,500	10,600	1,200	5,300	520	—	—
8.0		12,000	2,700	12,000	2,700	12,000	2,700	12,000	2,000	10,000	1,500	8,000	1,200	4,000	520	—	—
10.0		9,600	2,700	9,600	2,700	9,600	2,700	9,600	2,000	8,000	1,500	6,400	1,200	3,200	520	—	—
12.0		8,000	2,700	8,000	2,700	8,000	2,700	8,000	2,000	6,700	1,500	5,300	1,200	2,700	520	—	—
16.0		6,000	2,200	6,000	2,200	6,000	2,200	6,000	1,600	5,000	1,200	4,000	900	2,000	450	—	—
20.0		4,800	2,000	4,800	2,000	4,800	2,000	4,800	1,400	4,000	1,100	3,200	750	1,600	380	—	—
25.0		3,800	1,500	3,800	1,500	3,800	1,500	3,800	1,150	3,200	850	2,600	600	1,300	300	—	—
Standard Depth of Cut	ap	1.5DC										1.0DC				—	
	ae	0.05DC										0.02DC				—	

Groove Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
1.0		24,000	380	24,000	470	24,000	470	21,000	290	14,500	180	10,500	120	12,600	85	5,200	30
2.0		12,800	460	12,800	570	12,800	570	12,000	380	8,300	230	6,000	150	7,200	110	3,000	40
4.0		6,800	580	6,800	730	6,800	730	5,400	490	4,400	300	3,200	200	3,800	130	1,600	55
6.0		4,600	620	4,600	780	4,600	780	4,300	520	3,000	320	2,200	210	2,650	160	1,100	65
8.0		3,400	620	3,400	780	3,400	780	3,200	520	2,200	320	1,600	210	2,000	160	800	65
10.0		2,800	620	2,800	780	2,800	780	2,600	520	1,800	320	1,300	210	1,600	160	650	65
12.0		2,300	620	2,300	780	2,300	780	2,200	520	1,500	320	1,100	210	1,300	160	550	65
16.0		1,700	520	1,700	560	1,700	560	1,600	420	1,100	280	800	170	1,000	130	400	55
20.0		1,350	480	1,350	600	1,350	600	1,300	380	900	260	650	150	800	110	320	50
25.0		1,080	384	1,080	480	1,080	480	1,040	304	720	208	520	120	640	88	256	40
Standard Depth of Cut	ap	0.2DC		0.5DC						0.2DC		0.05DC		0.2DC			

GSX 40000S-2D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

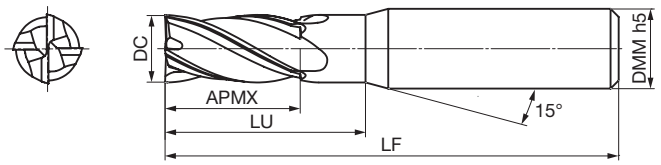
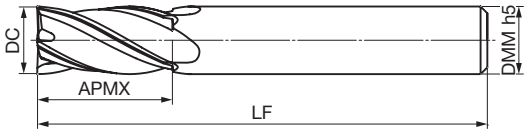


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 40100S-2D	●	**1.0**	2.5	3.5	40	4	1
40100S-2D-S3	●	**1.0**	2.5	3.5	38	3	1
40150S-2D	●	**1.5**	3.8	4.8	40	4	1
40200S-2D	●	**2.0**	5.0	6.0	40	4	1
40200S-2D-S3	●	**2.0**	5.0	6.0	38	3	1
GSX 40250S-2D	●	**2.5**	6.3	7.3	40	4	1
40300S-2D	●	**3.0**	7.5	9.0	45	6	1
40300S-2D-S3	●	**3.0**	7.5	—	38	3	2
40350S-2D	●	**3.5**	8.8	10.0	45	6	1
40400S-2D	●	**4.0**	11.0	14.0	45	6	1
GSX 40400S-2D-S4	●	**4.0**	11.0	—	45	4	2
40450S-2D	●	**4.5**	11.3	12.8	50	6	1
40500S-2D	●	**5.0**	13.0	19.6	50	6	1
40550S-2D	●	**5.5**	13.0	19.6	50	6	1
40600S-2D	●	**6.0**	13.0	—	50	6	2
GSX 40650S-2D	●	**6.5**	13.0	19.6	60	8	1
40700S-2D	●	**7.0**	16.0	21.1	60	8	1
40750S-2D	●	**7.5**	16.0	21.1	60	8	1
40800S-2D	●	**8.0**	19.0	—	60	8	2
40850S-2D	●	**8.5**	19.0	24.1	70	10	1
GSX 40900S-2D	●	**9.0**	19.0	24.1	70	10	1
40950S-2D	●	**9.5**	19.0	24.1	70	10	1
41000S-2D	●	**10.0**	22.0	—	70	10	2
41050S-2D	●	**10.5**	22.0	24.5	75	12	1
41100S-2D	●	**11.0**	22.0	24.5	75	12	1
GSX 41150S-2D	●	**11.5**	23.0	25.5	75	12	1
41200S-2D	●	**12.0**	26.0	—	75	12	2
41300S-2D	●	**13.0**	26.0	29.5	90	16	1
41350S-2D	●	**13.5**	27.0	30.5	90	16	1
41400S-2D	●	**14.0**	28.0	31.5	90	16	1
GSX 41500S-2D	●	**15.0**	30.0	33.5	90	16	1
41600S-2D	●	**16.0**	32.0	—	90	16	2
41700S-2D	●	**17.0**	35.0	39.5	100	20	1
41800S-2D	●	**18.0**	40.0	44.5	100	20	1
41900S-2D	●	**19.0**	40.0	44.5	100	20	1
GSX 42000S-2D	●	**20.0**	40.0	—	100	20	2
42200S-2D	●	**22.0**	44.0	49.0	110	25	1
42400S-2D	●	**24.0**	48.0	53.0	120	25	1
42500S-2D	●	**25.0**	50.0	—	120	25	2

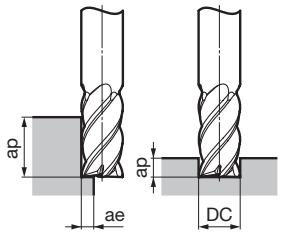
Grade: ACF20

Identification Code

GSX 4 0100 S - 2D - S3

Series Code	No. of Flutes	Dia.	Corner Style S: Sharp Edge	Cutting Edge Length	Shank Dia.

GSX 40000S-2D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. This series is not recommended for groove milling.
6. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		22,000	360	22,000	360	22,000	360	19,000	220	13,000	140	9,500	90	11,300	90	9,500	65
2.0		11,500	440	11,500	440	11,500	440	11,000	290	7,500	180	5,400	110	6,500	120	5,400	85
4.0		6,000	560	6,000	560	6,000	560	5,800	370	4,000	230	2,900	150	3,400	160	2,900	100
6.0		4,200	600	4,200	600	4,200	600	4,000	400	2,700	240	2,000	160	2,400	170	2,000	120
8.0		3,000	600	3,000	600	3,000	600	2,800	400	2,000	240	1,450	160	1,800	170	1,450	120
10.0		2,500	600	2,500	600	2,500	600	2,350	400	1,600	240	1,200	160	1,450	170	1,200	120
12.0		2,100	600	2,100	600	2,100	600	2,000	400	1,350	240	1,000	160	1,200	170	1,000	120
16.0		1,500	500	1,500	500	1,500	500	1,450	320	1,000	210	750	130	900	140	750	90
20.0		1,200	460	1,200	460	1,200	460	1,150	290	800	200	600	110	700	120	600	75
25.0		960	370	960	370	960	370	920	230	640	160	480	85	560	95	480	60
Standard Depth of Cut	ap	2.0DC															
	ae	0.03DC										0.01DC					

Groove Finishing

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		22,000	360	22,000	360	22,000	360	19,000	220	13,000	140	9,500	90	11,300	90	9,500	65
2.0		11,500	440	11,500	440	11,500	440	11,000	290	7,500	180	5,400	110	6,500	120	5,400	85
4.0		6,000	560	6,000	560	6,000	560	5,800	370	4,000	230	2,900	150	3,400	160	2,900	100
6.0		4,200	600	4,200	600	4,200	600	4,000	400	2,700	240	2,000	160	2,400	170	2,000	120
8.0		3,000	600	3,000	600	3,000	600	2,800	400	2,000	240	1,450	160	1,800	170	1,450	120
10.0		2,500	600	2,500	600	2,500	600	2,350	400	1,600	240	1,200	160	1,450	170	1,200	120
12.0		2,100	600	2,100	600	2,100	600	2,000	400	1,350	240	1,000	160	1,200	170	1,000	120
16.0		1,500	500	1,500	500	1,500	500	1,450	320	1,000	210	750	130	900	140	750	90
20.0		1,200	460	1,200	460	1,200	460	1,150	290	800	200	600	110	700	120	600	75
25.0		960	370	960	370	960	370	920	230	640	160	480	85	560	95	480	60
Standard Depth of Cut	ap	1.5DC															
	ae	Below 0.02DC															

GSX 40000C-2D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping

Fig 1

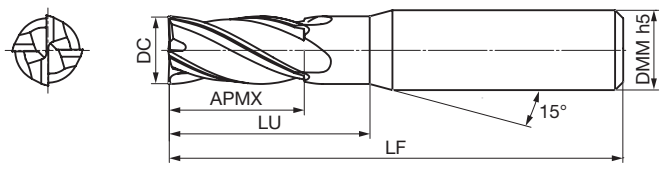
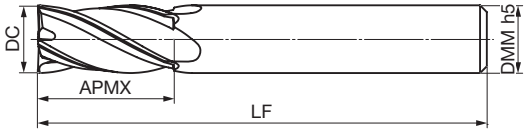


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 40100C-2D	●	**1.0**	2.0	3.0	40	4	1
40150C-2D	●	**1.5**	3.0	4.0	40	4	1
40200C-2D	●	**2.0**	4.0	5.0	40	4	1
40250C-2D	●	**2.5**	5.0	6.0	40	4	1
40300C-2D	●	**3.0**	6.0	7.5	45	6	1
GSX 40350C-2D	●	**3.5**	7.0	8.5	45	6	1
40400C-2D	●	**4.0**	8.0	9.5	45	6	1
40450C-2D	●	**4.5**	9.0	10.5	50	6	1
40500C-2D	●	**5.0**	10.0	12.0	50	6	1
40550C-2D	●	**5.5**	11.0	13.0	50	6	1
GSX 40600C-2D	●	**6.0**	12.0	—	50	6	2
40650C-2D	●	**6.5**	13.0	15.0	60	8	1
40700C-2D	●	**7.0**	14.0	16.0	60	8	1
40750C-2D	●	**7.5**	15.0	17.0	60	8	1
40800C-2D	●	**8.0**	16.0	—	60	8	2
GSX 40850C-2D	●	**8.5**	17.0	19.0	70	10	1
40900C-2D	●	**9.0**	18.0	20.0	70	10	1
40950C-2D	●	**9.5**	19.0	21.0	70	10	1
41000C-2D	●	**10.0**	20.0	—	70	10	2
41050C-2D	●	**10.5**	21.0	23.5	75	12	1
GSX 41100C-2D	●	**11.0**	22.0	24.5	75	12	1
41150C-2D	●	**11.5**	23.0	25.5	75	12	1
41200C-2D	●	**12.0**	24.0	—	75	12	2
41300C-2D	●	**13.0**	26.0	29.5	90	16	1
41400C-2D	●	**14.0**	28.0	31.5	90	16	1
GSX 41500C-2D	●	**15.0**	30.0	33.5	90	16	1
41600C-2D	●	**16.0**	32.0	—	90	16	2
41700C-2D	●	**17.0**	34.0	39.5	100	20	1
41800C-2D	●	**18.0**	36.0	40.5	100	20	1
41900C-2D	●	**19.0**	38.0	42.5	100	20	1
GSX 42000C-2D	●	**20.0**	40.0	—	100	20	2
42500C-2D	●	**25.0**	50.0	—	120	25	2

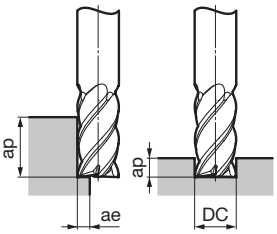
Grade: ACF20

Identification Code

GSX 4 0100 C - 2D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 40000C-2D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		24,000	470	24,000	470	24,000	470	21,000	290	14,500	180	10,500	120	12,600	120	10,500	85
2.0		12,800	570	12,800	570	12,800	570	12,000	380	8,300	230	6,000	150	7,200	160	6,000	110
4.0		6,800	730	6,800	730	6,800	730	6,400	490	4,400	300	3,200	200	3,800	210	3,200	130
6.0		4,600	780	4,600	780	4,600	780	4,300	520	3,000	320	2,200	210	2,650	220	2,200	150
8.0		3,400	780	3,400	780	3,400	780	3,200	520	2,200	320	1,600	210	2,000	220	1,600	150
10.0		2,800	780	2,800	780	2,800	780	2,600	520	1,800	320	1,300	210	1,500	220	1,300	150
12.0		2,300	780	2,300	780	2,300	780	2,200	520	1,500	320	1,100	210	1,300	220	1,100	150
16.0		1,700	650	1,700	650	1,700	650	1,600	420	1,100	280	800	170	1,000	180	800	120
20.0		1,350	600	1,350	600	1,350	600	1,300	380	900	260	650	150	800	160	650	100
25.0		1,000	480	1,000	480	1,000	480	1,000	300	700	200	500	120	640	120	500	80
Standard Depth of Cut	ap	1.5DC										1.0DC					
	ae	0.05DC										0.02DC					

Side Milling (Using High Speed Machining Centre)

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		60,000	1,200	60,000	1,200	60,000	1,200	60,000	850	60,000	720	48,000	500	32,000	300	—	—
2.0		47,800	2,200	47,800	2,200	47,800	2,200	47,800	1,600	39,800	1,200	31,800	900	15,900	400	—	—
4.0		23,900	2,600	23,900	2,600	23,900	2,600	23,900	1,900	19,900	1,400	15,900	1,100	8,000	490	—	—
6.0		16,000	2,700	16,000	2,700	16,000	2,700	16,000	2,000	13,300	1,500	10,600	1,200	5,300	520	—	—
8.0		12,000	2,700	12,000	2,700	12,000	2,700	12,000	2,000	10,000	1,500	8,000	1,200	4,000	520	—	—
10.0		9,600	2,700	9,600	2,700	9,600	2,700	9,600	2,000	8,000	1,500	6,400	1,200	3,200	520	—	—
12.0		8,000	2,700	8,000	2,700	8,000	2,700	8,000	2,000	6,700	1,500	5,300	1,200	2,700	520	—	—
16.0		6,000	2,200	6,000	2,200	6,000	2,200	6,000	1,600	5,000	1,200	4,000	900	2,000	450	—	—
20.0		4,800	2,000	4,800	2,000	4,800	2,000	4,800	1,400	4,000	1,100	3,200	750	1,600	380	—	—
25.0		3,800	1,500	3,800	1,500	3,800	1,500	3,800	1,100	3,200	900	2,500	600	1,300	300	—	—
Standard Depth of Cut	ap	1.5DC										1.0DC					
	ae	0.05DC										0.02DC					

Groove Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		24,000	380	24,000	470	24,000	470	21,000	290	14,500	180	10,500	120	12,600	85	5,200	30
2.0		12,800	460	12,800	570	12,800	570	12,000	380	8,300	230	6,000	150	7,200	110	3,000	40
4.0		6,800	580	6,800	730	6,800	730	5,400	490	4,400	300	3,200	200	3,800	130	1,600	55
6.0		4,600	620	4,600	780	4,600	780	4,300	520	3,000	320	2,200	210	2,650	160	1,100	65
8.0		3,400	620	3,400	780	3,400	780	3,200	520	2,200	320	1,600	210	2,000	160	800	65
10.0		2,800	620	2,800	780	2,800	780	2,600	520	1,800	320	1,300	210	1,600	160	650	65
12.0		2,300	620	2,300	780	2,300	780	2,200	520	1,500	320	1,100	210	1,300	160	550	65
16.0		1,700	520	1,700	560	1,700	560	1,600	420	1,100	280	800	170	1,000	130	400	55
20.0		1,350	480	1,350	600	1,350	600	1,300	380	900	260	650	150	800	110	320	50
25.0		1,000	380	1,000	450	1,000	450	1,000	300	700	200	500	120	640	80	250	40
Standard Depth of Cut	ap	0.2DC		0.5DC						0.2DC		0.05DC		0.2DC			

GSX 40000S-3D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

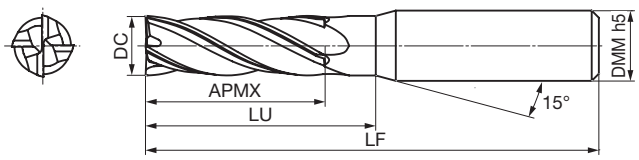
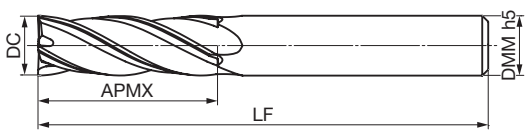


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 40100S-3D	●	**1.0**	3.0	4.0	40	4	1
40150S-3D	●	**1.5**	4.5	5.5	40	4	1
40200S-3D	●	**2.0**	6.0	7.0	40	4	1
40250S-3D	●	**2.5**	8.0	9.0	40	4	1
40300S-3D	●	**3.0**	9.0	10.5	50	6	1
GSX 40350S-3D	●	**3.5**	11.0	12.5	50	6	1
40400S-3D	●	**4.0**	12.0	13.5	50	6	1
40450S-3D	●	**4.5**	15.0	16.5	50	6	1
40500S-3D	●	**5.0**	15.0	17.0	50	6	1
40550S-3D	●	**5.5**	18.0	20.0	50	6	1
GSX 40600S-3D	●	**6.0**	18.0	—	50	6	2
40650S-3D	●	**6.5**	20.0	22.0	70	8	1
40700S-3D	●	**7.0**	21.0	23.0	70	8	1
40750S-3D	●	**7.5**	23.0	25.0	70	8	1
40800S-3D	●	**8.0**	24.0	—	70	8	2
GSX 40850S-3D	●	**8.5**	26.0	28.0	75	10	1
40900S-3D	●	**9.0**	27.0	29.0	75	10	1
40950S-3D	●	**9.5**	29.0	31.0	75	10	1
41000S-3D	●	**10.0**	30.0	—	90	10	2
41050S-3D	●	**10.5**	32.0	34.5	90	12	1
GSX 41100S-3D	●	**11.0**	33.0	35.5	90	12	1
41150S-3D	●	**11.5**	35.0	37.5	90	12	1
41200S-3D	●	**12.0**	36.0	—	90	12	2
41300S-3D	●	**13.0**	39.0	42.5	100	16	1
41400S-3D	●	**14.0**	42.0	45.5	110	16	1
GSX 41500S-3D	●	**15.0**	45.0	48.5	110	16	1
41600S-3D	●	**16.0**	48.0	—	110	16	2
41700S-3D	●	**17.0**	51.0	55.5	110	20	1
41800S-3D	●	**18.0**	54.0	58.5	120	20	1
41900S-3D	●	**19.0**	57.0	61.5	120	20	1
GSX 42000S-3D	●	**20.0**	60.0	—	120	20	2
42200S-3D	●	**22.0**	66.0	71.0	130	25	1
42500S-3D	●	**25.0**	75.0	—	130	25	2

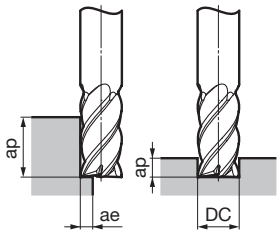
Grade: ACF20

Identification Code

GSX 4 0100 S - 3D

Series Code	No. of Flutes	Dia.	Corner Style S: Sharp Edge	Cutting Edge Length

GSX 40000S-3D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. In some cases, chattering may occur in early stages of milling but will cease after 2m of cutting.
5. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		18,500	250	18,500	250	18,500	250	17,000	150	11,500	100	8,000	65	9,400	65	8,000	45
2.0		9,400	250	9,400	250	9,400	250	8,500	200	6,700	130	4,000	65	4,600	90	4,000	60
4.0		4,500	350	4,500	350	4,500	350	4,300	250	3,500	210	2,000	110	2,300	110	2,000	70
6.0		3,100	400	3,100	400	3,100	400	2,800	300	2,400	220	1,300	120	1,500	120	1,300	90
8.0		2,300	380	2,300	380	2,300	380	2,100	300	1,800	220	950	120	1,100	120	900	90
10.0		1,800	350	1,800	350	1,800	350	1,700	300	1,400	220	700	120	900	120	800	90
12.0		1,500	350	1,500	350	1,500	350	1,400	300	1,200	220	650	110	750	120	650	90
16.0		1,100	300	1,100	300	1,100	300	1,000	240	900	190	480	90	550	100	490	70
20.0		900	280	900	280	900	280	850	210	700	170	400	80	440	90	400	60
25.0		720	220	720	220	720	220	680	170	560	130	320	60	352	70	320	50
Standard Depth of Cut	ap	2.5DC								2.0DC							
	ae	Below ø3: 0.02DC , Above ø3 to Below ø8: 0.05DC, Above ø8: 0.07DC								0.01DC							

Groove Finishing

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		18,500	250	18,500	250	18,500	250	17,000	150	11,500	100	8,000	65	9,400	65	8,000	45
2.0		9,400	250	9,400	250	9,400	250	8,500	200	6,700	130	4,000	65	4,600	90	4,000	60
4.0		4,500	350	4,500	350	4,500	350	4,300	250	3,500	210	2,000	110	2,300	110	2,000	70
6.0		3,100	400	3,100	400	3,100	400	2,800	300	2,400	220	1,300	120	1,500	120	1,300	90
8.0		2,300	380	2,300	380	2,300	380	2,100	300	1,800	220	950	120	1,100	120	900	90
10.0		1,800	350	1,800	350	1,800	350	1,700	300	1,400	220	700	120	900	120	800	90
12.0		1,500	350	1,500	350	1,500	350	1,400	300	1,200	220	650	110	750	120	650	90
16.0		1,100	300	1,100	300	1,100	300	1,000	240	900	190	480	90	550	100	490	70
20.0		900	280	900	280	900	280	850	210	700	170	400	80	440	90	400	60
25.0		720	220	720	220	720	220	680	170	560	130	320	60	352	70	320	50
Standard Depth of Cut	ap	1.5DC															
	ae	Below 0.02DC															

GSX 40000C-3D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling

Fig 1

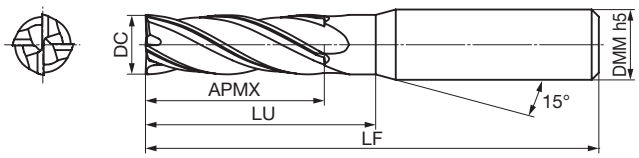
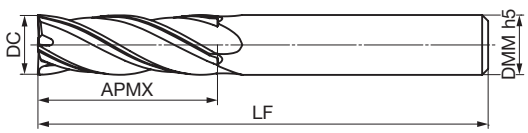


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 40100C-3D	●	**1.0**	3.0	4.0	40	4	1
40150C-3D	●	**1.5**	4.5	5.5	40	4	1
40200C-3D	●	**2.0**	6.0	7.0	40	4	1
40250C-3D	●	**2.5**	7.5	8.5	40	4	1
40300C-3D	●	**3.0**	9.0	10.5	50	6	1
GSX 40350C-3D	●	**3.5**	11.0	12.5	50	6	1
40400C-3D	●	**4.0**	12.0	13.5	50	6	1
40450C-3D	●	**4.5**	14.0	15.5	50	6	1
40500C-3D	●	**5.0**	15.0	17.0	50	6	1
40550C-3D	●	**5.5**	17.0	19.0	50	6	1
GSX 40600C-3D	●	**6.0**	18.0	—	50	6	2
40650C-3D	●	**6.5**	20.0	22.0	70	8	1
40700C-3D	●	**7.0**	21.0	23.0	70	8	1
40750C-3D	●	**7.5**	23.0	25.0	70	8	1
40800C-3D	●	**8.0**	24.0	—	70	8	2
GSX 40850C-3D	●	**8.5**	26.0	28.0	75	10	1
40900C-3D	●	**9.0**	27.0	29.0	75	10	1
40950C-3D	●	**9.5**	29.0	31.0	75	10	1
41000C-3D	●	**10.0**	30.0	—	90	10	2
41050C-3D	●	**10.5**	32.0	34.5	90	12	1
GSX 41100C-3D	●	**11.0**	33.0	35.5	90	12	1
41150C-3D	●	**11.5**	35.0	37.5	90	12	1
41200C-3D	●	**12.0**	36.0	—	90	12	2
41300C-3D	●	**13.0**	39.0	42.5	100	16	1
41400C-3D	●	**14.0**	42.0	45.5	110	16	1
GSX 41500C-3D	●	**15.0**	45.0	48.5	110	16	1
41600C-3D	●	**16.0**	48.0	—	110	16	2
41700C-3D	●	**17.0**	51.0	55.5	110	20	1
41800C-3D	●	**18.0**	54.0	58.5	120	20	1
41900C-3D	●	**19.0**	57.0	61.5	120	20	1
GSX 42000C-3D	●	**20.0**	60.0	—	120	20	2
42500C-3D	●	**25.0**	75.0	—	130	25	2

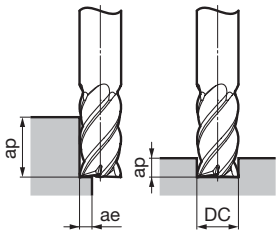
Grade: ACF20

Identification Code

GSX 4 0100 C - 3D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 40000C-3D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. In some cases, chattering may occur in early stages of milling but will cease after 2m of cutting.
5. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		21,000	360	21,000	360	21,000	360	19,000	220	13,000	140	9,000	90	10,500	90	9,000	65
2.0		10,500	360	10,500	360	10,500	360	9,600	290	7,500	180	4,500	110	5,200	120	4,500	85
4.0		5,200	500	5,200	500	5,200	500	4,800	370	4,000	280	2,250	150	2,600	160	2,250	100
6.0		3,500	560	3,500	560	3,500	560	3,200	400	2,700	300	1,500	160	1,700	170	1,500	120
8.0		2,600	520	2,600	520	2,600	520	2,400	400	2,000	300	1,100	160	1,300	170	1,100	120
10.0		2,100	500	2,100	500	2,100	500	1,900	400	1,600	300	900	160	1,000	160	900	120
12.0		1,750	500	1,750	500	1,750	500	1,600	400	1,350	300	750	150	850	160	750	120
16.0		1,300	420	1,300	420	1,300	420	1,200	330	1,000	260	550	120	650	140	550	100
20.0		1,050	380	1,050	380	1,050	380	950	290	800	230	450	110	500	120	450	90
25.0		840	300	840	300	840	300	760	230	640	180	360	85	400	95	360	70
Standard Depth of Cut	ap	2.5DC										2.0DC					
	ae	Below ø3: 0.05DC , Above ø3 to Below ø8: 0.1DC, Above ø8: 0.15DC								0.02DC							

Groove Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		16,600	140	16,600	140	16,600	140	15,500	100	10,500	100	7,500	70	9,400	60	3,750	20
2.0		9,500	160	9,500	160	9,500	160	9,000	180	6,200	120	4,500	90	5,200	80	2,250	30
4.0		5,200	160	5,200	180	5,200	180	4,800	160	3,400	110	2,200	65	2,600	70	1,250	25
6.0		3,500	160	3,500	200	3,500	200	3,200	160	2,550	120	1,500	65	1,700	70	950	25
8.0		2,600	160	2,600	200	2,600	200	2,400	160	1,900	120	1,100	65	1,300	70	700	25
10.0		2,100	160	2,100	200	2,100	200	1,900	160	1,500	120	900	65	1,000	70	550	25
12.0		1,750	160	1,750	200	1,750	200	1,600	160	1,250	120	750	65	850	70	450	25
16.0		1,300	160	1,300	200	1,300	200	1,200	160	950	120	550	65	650	70	350	25
20.0		1,050	160	1,050	200	1,050	200	950	160	750	120	450	65	500	70	280	55
25.0		840	128	840	160	840	160	760	128	600	96	360	52	400	56	224	44
Standard Depth of Cut	ap	0.1DC		0.2DC								0.05DC		0.1DC			

GSX 40000S-4D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

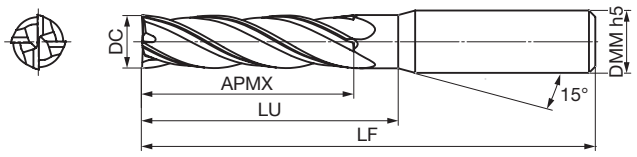
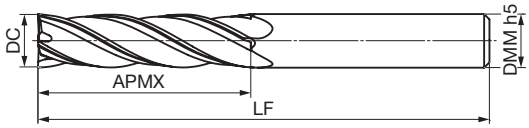


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 40100S-4D	●	**1.0**	4.0	5.0	40	4	1
40150S-4D	●	**1.5**	6.0	7.0	40	4	1
40200S-4D	●	**2.0**	8.0	9.0	40	4	1
40250S-4D	●	**2.5**	10.0	11.0	50	4	1
40300S-4D	●	**3.0**	12.0	13.5	50	6	1
GSX 40350S-4D	●	**3.5**	14.0	15.5	50	6	1
40400S-4D	●	**4.0**	16.0	17.5	50	6	1
40450S-4D	●	**4.5**	18.0	19.5	60	6	1
40500S-4D	●	**5.0**	20.0	22.0	60	6	1
40550S-4D	●	**5.5**	22.0	24.0	60	6	1
GSX 40600S-4D	●	**6.0**	24.0	—	60	6	2
40650S-4D	●	**6.5**	26.0	28.0	70	8	1
40700S-4D	●	**7.0**	28.0	30.0	80	8	1
40750S-4D	●	**7.5**	30.0	32.0	80	8	1
40800S-4D	●	**8.0**	32.0	—	80	8	2
GSX 40850S-4D	●	**8.5**	34.0	36.0	90	10	1
40900S-4D	●	**9.0**	36.0	38.0	90	10	1
40950S-4D	●	**9.5**	39.0	41.0	90	10	1
41000S-4D	●	**10.0**	40.0	—	90	10	2
41050S-4D	●	**10.5**	42.0	44.5	100	12	1
GSX 41100S-4D	●	**11.0**	44.0	46.5	100	12	1
41150S-4D	●	**11.5**	46.0	48.5	100	12	1
41200S-4D	●	**12.0**	48.0	—	100	12	2
41300S-4D	●	**13.0**	52.0	55.5	110	16	1
41400S-4D	●	**14.0**	56.0	59.5	110	16	1
GSX 41500S-4D	●	**15.0**	60.0	63.5	120	16	1
41600S-4D	●	**16.0**	64.0	—	120	16	2
41700S-4D	●	**17.0**	68.0	72.5	130	20	1
41800S-4D	●	**18.0**	72.0	76.5	130	20	1
41900S-4D	●	**19.0**	76.0	80.5	140	20	1
GSX 42000S-4D	●	**20.0**	80.0	—	140	20	2
42500S-4D	●	**25.0**	100.0	—	160	25	2

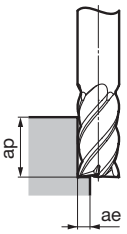
Grade: ACF20

Identification Code

GSX 4 0100 S - 4D

Series Code	No. of Flutes	Dia.	Corner Style S: Sharp Edge	Cutting Edge Length

GSX 40000S-4D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. In some cases, chattering may occur in early stages of milling but will cease after 2m of cutting.
5. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		7,950	120	7,950	120	7,950	120	6,250	70	5,750	50	4,000	35	4,850	35	4,000	35
2.0		4,050	120	4,050	120	4,050	120	3,100	90	2,850	70	2,050	50	2,400	50	2,050	35
4.0		1,950	170	1,950	170	1,950	170	1,650	100	1,400	90	710	35	1,200	45	1,050	30
6.0		1,350	130	1,350	130	1,350	130	1,000	140	930	120	700	55	800	40	700	30
8.0		970	190	970	190	970	190	740	140	720	120	520	55	560	40	490	30
10.0		770	180	770	180	770	180	630	120	570	100	360	50	490	40	410	30
12.0		640	170	640	170	640	170	500	120	460	100	350	55	400	40	350	30
16.0		460	140	460	140	460	140	370	100	360	90	260	50	280	40	270	30
20.0		390	130	390	130	390	130	310	90	280	70	210	45	240	40	210	30
25.0		310	100	310	100	310	100	250	70	220	55	170	35	190	30	170	25
Standard Depth of Cut	ap	2.5DC								2.0DC							
	ae	Below ø3: 0.02DC , Above ø3 to Below ø8: 0.05DC, Above ø8: 0.07DC								0.01DC							

GSX 40000C-4D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling

Fig 1

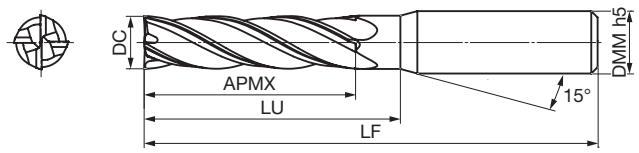
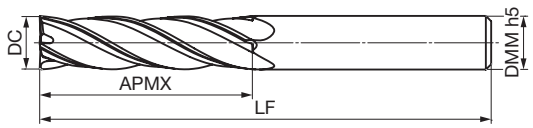


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 40100C-4D	●	**1.0**	4.0	5.0	40	4	1
40150C-4D	●	**1.5**	6.0	7.0	40	4	1
40200C-4D	●	**2.0**	8.0	9.0	40	4	1
40250C-4D	●	**2.5**	10.0	11.0	50	4	1
40300C-4D	●	**3.0**	12.0	13.5	50	6	1
GSX 40350C-4D	●	**3.5**	14.0	15.5	50	6	1
40400C-4D	●	**4.0**	16.0	17.5	50	6	1
40450C-4D	●	**4.5**	18.0	19.5	60	6	1
40500C-4D	●	**5.0**	20.0	22.0	60	6	1
40550C-4D	●	**5.5**	22.0	24.0	60	6	1
GSX 40600C-4D	●	**6.0**	24.0	—	60	6	2
40650C-4D	●	**6.5**	26.0	28.0	70	8	1
40700C-4D	●	**7.0**	28.0	30.0	80	8	1
40750C-4D	●	**7.5**	30.0	32.0	80	8	1
40800C-4D	●	**8.0**	32.0	—	80	8	2
GSX 40850C-4D	●	**8.5**	34.0	36.0	90	10	1
40900C-4D	●	**9.0**	36.0	28.0	90	10	1
40950C-4D	●	**9.5**	39.0	41.0	90	10	1
41000C-4D	●	**10.0**	40.0	—	90	10	2
41050C-4D	●	**10.5**	42.0	44.5	100	12	1
GSX 41100C-4D	●	**11.0**	44.0	46.5	100	12	1
41150C-4D	●	**11.5**	46.0	48.5	100	12	1
41200C-4D	●	**12.0**	48.0	—	100	12	2
41300C-4D	●	**13.0**	52.0	55.5	110	16	1
41400C-4D	●	**14.0**	56.0	59.5	110	16	1
GSX 41500C-4D	●	**15.0**	60.0	63.5	120	16	1
41600C-4D	●	**16.0**	64.0	—	120	16	2
41700C-4D	●	**17.0**	68.0	72.5	130	20	1
41800C-4D	●	**18.0**	72.0	76.5	130	20	1
41900C-4D	●	**19.0**	76.0	80.5	140	20	1
GSX 42000C-4D	●	**20.0**	80.0	—	140	20	2
42500C-4D	●	**25.0**	100.0	—	160	25	2

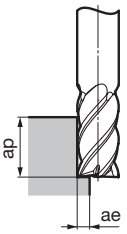
Grade: ACF20

Identification Code

GSX 4 0100 C - 4D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSX 40000C-4D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. In some cases, chattering may occur in early stages of milling but will cease after 2m of cutting.
5. If chatter is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. This series is not recommended for groove milling.
7. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

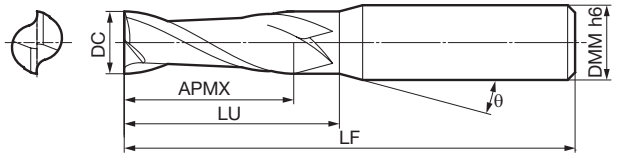
Work Material / Cutting Conditions		Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		9,000	140	9,000	140	9,000	140	7,000	80	6,500	60	4,500	40	5,400	40	4,500	40
2.0		4,500	140	4,500	140	4,500	140	3,500	100	3,200	80	2,300	55	2,700	55	2,300	40
4.0		2,250	200	2,250	200	2,250	200	1,750	120	1,600	100	1,200	60	1,350	50	1,200	35
6.0		1,500	250	1,500	250	1,500	250	1,150	160	1,050	140	800	65	900	45	800	35
8.0		1,100	220	1,100	220	1,100	220	850	160	800	130	600	65	660	45	600	35
10.0		900	210	900	210	900	210	700	140	650	120	460	65	540	45	460	35
12.0		750	200	750	200	750	200	580	140	520	110	400	65	450	45	400	35
16.0		550	170	550	170	550	170	440	120	400	95	300	55	330	45	300	35
20.0		450	150	450	150	450	150	350	100	320	80	240	50	270	45	240	35
25.0		360	120	360	120	360	120	280	80	250	60	190	40	210	35	190	30
Standard Depth of Cut	ap	3.5DC										3.0DC					
	ae	Below ø3: 0.04DC , Above ø3 to Below ø8: 0.08DC, Above ø8: 0.1DC										0.02DC					

SSM 2000 type

General Steel | Carbon Steel | Cast Iron | Aluminum Alloy

2 Flutes | Uncoated Carbide | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1



DC	θ
< ø3	10°
≥ ø3 < ø6	15°
> ø6	20°

DC	Tolerance
D ≤ 6.0	-0.010 -0.030
6.0 < D ≤ 10.0	-0.015 -0.040
10.0 < D	-0.020 -0.050

Body (Diameter ø0.2 to 4.6mm)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSM 2002	▲	**0.2**	0.5	0.5	40	3	1
2003	▲	**0.3**	1.0	1.0	40	3	1
2004	▲	**0.4**	1.0	1.0	40	3	1
2005	▲	**0.5**	1.5	1.5	40	3	1
2006	▲	**0.6**	1.5	1.5	40	3	1
SSM 2007	▲	**0.7**	1.5	1.5	40	3	1
2008	▲	**0.8**	2.0	2.0	40	3	1
2009	▲	**0.9**	2.0	2.0	40	3	1
2010	▲	**1.0**	3.0	3.9	40	4	1
2011	▲	**1.1**	3.0	4.2	40	4	1
SSM 2012	▲	**1.2**	3.0	4.0	40	4	1
2013	▲	**1.3**	3.0	4.3	40	4	1
2014	▲	**1.4**	3.0	4.1	40	4	1
2015	▲	**1.5**	5.0	5.9	40	4	1
2016	▲	**1.6**	5.0	6.1	40	4	1
SSM 2017	▲	**1.7**	5.0	5.9	40	4	1
2018	▲	**1.8**	5.0	6.2	40	4	1
2019	▲	**1.9**	5.0	6.0	40	4	1
2020	▲	**2.0**	6.0	6.8	40	4	1
2021	▲	**2.1**	6.0	7.1	40	4	1
SSM 2022	▲	**2.2**	6.0	6.8	40	4	1
2023	▲	**2.3**	6.0	7.1	40	4	1
2024	▲	**2.4**	6.0	6.9	40	4	1
2025	▲	**2.5**	8.0	8.7	40	4	1
2026	▲	**2.6**	8.0	9.0	40	4	1
SSM 2027	▲	**2.7**	8.0	8.8	40	4	1
2028	▲	**2.8**	8.0	9.0	40	4	1
2029	▲	**2.9**	8.0	8.8	40	4	1
2030	▲	**3.0**	8.0	12.9	45	6	1
2031	▲	**3.1**	8.0	12.0	45	6	1
SSM 2032	▲	**3.2**	8.0	12.2	45	6	1
2033	▲	**3.3**	8.0	12.4	45	6	1
2034	▲	**3.4**	8.0	12.6	45	6	1
2035	▲	**3.5**	8.0	12.8	45	6	1
2036	▲	**3.6**	10.0	14.0	45	6	1
SSM 2037	▲	**3.7**	10.0	14.2	45	6	1
2038	▲	**3.8**	10.0	14.3	45	6	1
2039	▲	**3.9**	10.0	14.5	45	6	1
2040	▲	**4.0**	10.0	14.7	45	6	1
2041	▲	**4.1**	10.0	14.4	45	6	1
SSM 2042	▲	**4.2**	10.0	14.6	45	6	1
2043	▲	**4.3**	10.0	14.8	45	6	1
2044	▲	**4.4**	10.0	15.0	45	6	1
2045	▲	**4.5**	10.0	15.2	45	6	1
2046	▲	**4.6**	12.0	17.8	50	6	1

Grade: A1

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SSM 2000 type

General Steel | Carbon Steel | Cast Iron | Aluminum Alloy

2 Flutes | Uncoated Carbide | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

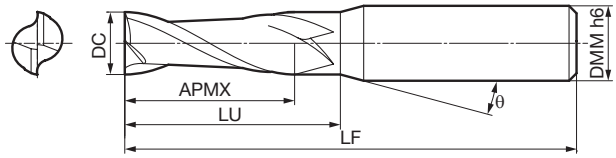
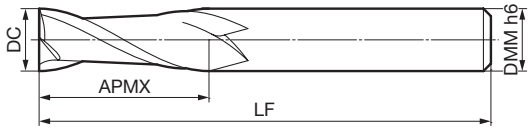


Fig 2



DC	θ
< ø3	10°
≥ ø3 < ø6	15°
> ø6	20°

DC	Tolerance
D ≤ 6.0	-0.010 -0.030
6.0 < D ≤ 10.0	-0.015 -0.040
10.0 < D	-0.020 -0.050

Body (Diameter ø4.7 to 9.1mm)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSM 2047	▲	**4.7**	12.0	18.0	50	6	1
2048	▲	**4.8**	12.0	18.2	50	6	1
2049	▲	**4.9**	12.0	18.4	50	6	1
2050	▲	**5.0**	12.0	18.6	50	6	1
2051	▲	**5.1**	12.0	18.3	50	6	1
SSM 2052	▲	**5.2**	12.0	18.5	50	6	1
2053	▲	**5.3**	12.0	18.6	50	6	1
2054	▲	**5.4**	12.0	18.8	50	6	1
2055	▲	**5.5**	12.0	19.0	50	6	1
2056	▲	**5.6**	12.0	19.2	50	6	1
SSM 2057	▲	**5.7**	12.0	19.4	50	6	1
2058	▲	**5.8**	12.0	19.6	50	6	1
2059	▲	**5.9**	12.0	19.8	50	6	1
2060	▲	**6.0**	12.0	—	50	6	2
2061	▲	**6.1**	12.0	16.3	50	8	1
SSM 2062	▲	**6.2**	12.0	16.5	50	8	1
2063	▲	**6.3**	12.0	16.6	50	8	1
2064	▲	**6.4**	12.0	16.8	50	8	1
2065	▲	**6.5**	12.0	16.9	50	8	1
2066	▲	**6.6**	15.0	23.0	55	8	1
SSM 2067	▲	**6.7**	15.0	23.2	55	8	1
2068	▲	**6.8**	15.0	23.3	55	8	1
2069	▲	**6.9**	15.0	23.4	55	8	1
2070	▲	**7.0**	15.0	23.6	55	8	1
2071	▲	**7.1**	15.0	23.7	55	8	1
SSM 2072	▲	**7.2**	15.0	23.9	55	8	1
2073	▲	**7.3**	15.0	24.0	55	8	1
2074	▲	**7.4**	15.0	24.1	55	8	1
2075	▲	**7.5**	15.0	24.3	55	8	1
2076	▲	**7.6**	15.0	23.9	55	8	1
SSM 2077	▲	**7.7**	15.0	24.0	55	8	1
2078	▲	**7.8**	15.0	24.2	55	8	1
2079	▲	**7.9**	15.0	24.3	55	8	1
2080	▲	**8.0**	15.0	—	55	8	2
2081	▲	**8.1**	15.0	22.2	55	10	1
SSM 2082	▲	**8.2**	15.0	22.5	55	10	1
2083	▲	**8.3**	15.0	22.6	55	10	1
2084	▲	**8.4**	15.0	22.8	55	10	1
2085	▲	**8.5**	15.0	22.9	55	10	1
2086	▲	**8.6**	15.0	23.0	55	10	1
SSM 2087	▲	**8.7**	15.0	23.2	55	10	1
2088	▲	**8.8**	15.0	23.3	55	10	1
2089	▲	**8.9**	15.0	23.4	55	10	1
2090	▲	**9.0**	15.0	23.6	55	10	1
2091	▲	**9.1**	15.0	23.7	55	10	1

Grade: A1

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SSM 2000 type

General Steel | Carbon Steel | Cast Iron | Aluminum Alloy

2 Flutes | Uncoated Carbide | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

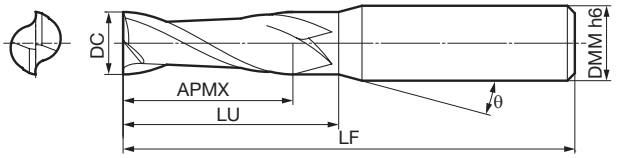
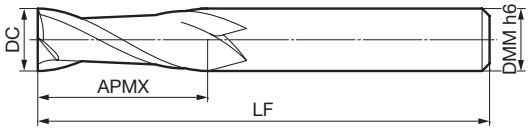


Fig 2



DC	θ
< ø3	10°
≥ ø3 < ø6	15°
> ø6	20°

DC	Tolerance
D ≤ 6.0	-0.010 -0.030
6.0 < D ≤ 10.0	-0.015 -0.040
10.0 < D	-0.020 -0.050

Body (Diameter ø9.2 to 30.0mm)

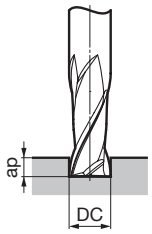
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSM 2092	▲	**9.2**	15.0	23.9	55	10	1
2093	▲	**9.3**	15.0	24.0	55	10	1
2094	▲	**9.4**	15.0	24.1	55	10	1
2095	▲	**9.5**	15.0	24.3	55	10	1
2096	▲	**9.6**	18.0	28.9	65	10	1
SSM 2097	▲	**9.7**	18.0	29.0	65	10	1
2098	▲	**9.8**	18.0	29.2	65	10	1
2099	▲	**9.9**	18.0	29.3	65	10	1
2100	▲	**10.0**	18.0	—	65	10	2
2105	▲	**10.5**	18.0	29.4	70	12	1
SSM 2110	▲	**11.0**	18.0	30.1	70	12	1
2115	▲	**11.5**	18.0	29.8	70	12	1
2120	▲	**12.0**	18.0	—	70	12	2
2125	▲	**12.5**	20.0	31.1	80	16	1
2130	▲	**13.0**	20.0	31.8	80	16	1
SSM 2135	▲	**13.5**	20.0	31.5	80	16	1
2140	▲	**14.0**	20.0	32.2	80	16	1
2145	▲	**14.5**	25.0	37.9	80	16	1
2150	▲	**15.0**	25.0	38.6	80	16	1
2155	▲	**15.5**	35.0	49.8	90	16	1
SSM 2160	▲	**16.0**	35.0	—	90	16	2
2165	▲	**16.5**	35.0	45.1	90	20	1
2170	▲	**17.0**	35.0	45.8	90	20	1
2175	▲	**17.5**	40.0	56	105	20	1
2180	▲	**18.0**	40.0	56.7	105	20	1
SSM 2185	▲	**18.5**	40.0	56.9	105	20	1
2190	▲	**19.0**	40.0	57.6	105	20	1
2195	▲	**19.5**	40.0	58.3	105	20	1
2200	▲	**20.0**	40.0	—	105	20	2
2210	▲	**21.0**	40.0	54.5	105	25	1
SSM 2220	▲	**22.0**	40.0	55.8	105	25	1
2230	▲	**23.0**	45.0	65.2	115	25	1
2240	▲	**24.0**	45.0	63.6	115	25	1
2250	▲	**25.0**	50.0	—	120	25	2
2300	▲	**30.0**	55.0	—	130	32	1

Grade: A1

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SSM 2000 type



Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Groove Milling

Work Material / Cutting Conditions		Carbon Steel / Alloy Steel (Below 30HRC)		Carbon Steel / Alloy Steel (Below 40HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Cast Iron Special Cast Iron	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
0.2		35,000	30	35,000	20	28,000	15	35,000	30
0.6		20,000	45	16,000	30	13,000	20	26,000	80
1.0		12,000	45	9,600	35	7,800	30	15,600	150
2.0		6,000	70	4,800	35	3,900	30	7,800	165
3.0		4,000	90	3,200	35	2,600	30	5,200	170
4.0		3,000	90	2,400	35	1,950	30	3,900	170
6.0		2,000	90	1,600	35	1,300	30	2,600	210
8.0		1,500	90	1,200	35	980	30	1,950	250
10.0		1,200	90	960	35	780	30	1,560	250
12.0		1,000	90	800	35	650	30	1,300	250
16.0		750	90	600	40	490	30	970	260
20.0		600	90	480	40	390	30	780	260
25.0		480	90	380	40	310	30	620	250
30.0		400	90	320	40	260	30	520	250
Standard Depth of Cut	ap ø1 or less	0.1DC		0.1DC		0.1DC		0.1DC	
	ø1.1 to ø2.9 ap	0.3DC		0.3DC		0.3DC		0.3DC	
	ap ø3 and above	0.5DC		0.5DC		0.5DC		0.5DC	

SSM 4000 type

General Steel | Carbon Steel | Cast Iron | Aluminum Alloy

4 Flutes | Uncoated Carbide | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing

Fig 1

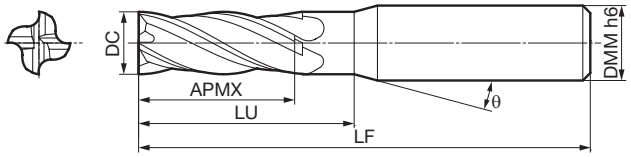
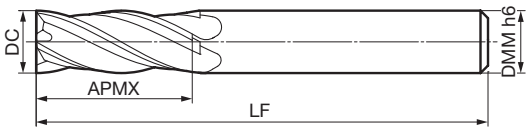


Fig 2



DC	θ
< ø3	10°
≥ ø3 < ø6	15°
> ø6	20°

DC	Tolerance
D ≤ 6.0	-0.010 -0.030
6.0 < D ≤ 10.0	-0.015 -0.040
10.0 < D	-0.020 -0.050

Body

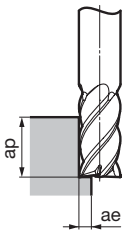
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSM 4015	▲	**1.5**	5.0	5.9	40	4	1
4020	▲	**2.0**	6.0	6.8	40	4	1
4025	▲	**2.5**	8.0	8.7	40	4	1
4030	▲	**3.0**	8.0	11.4	45	6	1
4035	▲	**3.5**	8.0	11.8	45	6	1
SSM 4040	▲	**4.0**	10.0	13.7	45	6	1
4045	▲	**4.5**	10.0	14.2	45	6	1
4050	▲	**5.0**	12.0	17.1	50	6	1
4055	▲	**5.5**	12.0	17.5	50	6	1
4060	▲	**6.0**	12.0	—	50	6	2
SSM 4065	▲	**6.5**	12.0	16.9	50	8	1
4070	▲	**7.0**	15.0	21.1	55	8	1
4075	▲	**7.5**	15.0	21.3	55	8	1
4080	▲	**8.0**	15.0	—	55	8	2
4085	▲	**8.5**	15.0	21.9	55	10	1
SSM 4090	▲	**9.0**	15.0	22.1	55	10	1
4095	▲	**9.5**	15.0	22.3	55	10	1
4100	▲	**10.0**	18.0	—	65	10	2
4105	*	**10.5**	18.0	19.9	65	12	1
4110	▲	**11.0**	18.0	20.6	70	12	1
SSM 4120	▲	**12.0**	18.0	—	70	12	2
4130	▲	**13.0**	20.0	28.8	80	16	1
4140	▲	**14.0**	20.0	29.2	80	16	1
4150	▲	**15.0**	25.0	34.6	80	16	1
4160	▲	**16.0**	35.0	—	90	16	2
SSM 4170	*	**17.0**	35.0	42.8	90	20	1
4180	▲	**18.0**	40.0	51.2	105	20	1
4190	*	**19.0**	40.0	51.6	105	20	1
4200	▲	**20.0**	40.0	—	105	20	2
4210	*	**21.0**	40.0	52.5	105	25	1
SSM 4220	*	**22.0**	40.0	52.8	105	25	1
4230	*	**23.0**	45.0	58.2	115	25	1
4240	*	**24.0**	45.0	58.6	115	25	1
4250	▲	**25.0**	50.0	—	120	25	2

Grade: A1

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)

SSM 4000 type



Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Side Milling

Work Material / Cutting Conditions		Carbon Steel / Alloy Steel (Below 30HRC)		Carbon Steel / Alloy Steel (Below 40HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Cast Iron Special Cast Iron	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.5		7,600	250	7,000	100	5,600	85	9,800	550
2.0		5,720	250	5,250	100	4,200	85	7,350	550
3.0		3,800	250	3,500	100	2,800	80	4,900	550
6.0		1,900	280	1,750	100	1,400	80	2,450	650
8.0		1,430	280	1,310	100	1,050	80	1,840	650
10.0		1,140	280	1,050	100	840	80	1,470	670
12.0		950	280	880	100	700	80	1,230	680
16.0		710	320	660	100	525	80	920	830
20.0		570	300	530	95	420	80	740	920
25.0		460	260	420	80	335	65	590	740
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC		1.5DC	
	ae	0.1DC		0.1DC		0.1DC		0.1DC	

GSV 4000-2.5D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | 40° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping

Fig 1

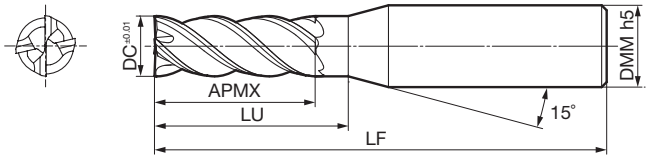
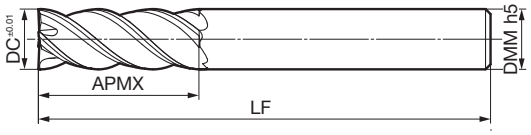


Fig 2



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSV 4020-2.5D	●	**2.0**	5	6.5	50	4	1
4030-2.5D	●	**3.0**	8	9.5	50	6	1
4040-2.5D	●	**4.0**	10	11.5	50	6	1
4050-2.5D	●	**5.0**	13	14.5	60	6	1
4060-2.5D	●	**6.0**	15	—	60	6	2
GSV 4070-2.5D	●	**7.0**	18	20.0	70	8	1
4080-2.5D	●	**8.0**	20	—	80	8	2
4090-2.5D	●	**9.0**	23	25.0	90	10	1
4100-2.5D	●	**10.0**	25	—	90	10	2
4110-2.5D	●	**11.0**	28	30.5	90	12	1
GSV 4120-2.5D	●	**12.0**	30	—	90	12	2
4140-2.5D	●	**14.0**	35	37.5	110	16	1
4150-2.5D	●	**15.0**	38	41.0	110	16	1
4160-2.5D	●	**16.0**	40	—	115	16	2
4180-2.5D	●	**18.0**	45	48.0	120	20	1
GSV 4200-2.5D	●	**20.0**	50	—	125	20	2
4250-2.5D	●	**25.0**	63	—	140	25	2

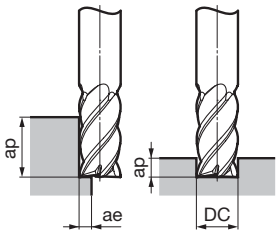
Grade: ACF20

Identification Code

GSV 4 120 - 2.5D

Series Code | No. of Flutes | Dia. | Cutting Edge Length

GSV 4000-2.5D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		13,000	1,000	10,000	800	8,000	700	10,000	580	5,000	200
4.0		9,600	1,200	8,000	1,000	6,000	800	5,500	650	3,000	230
6.0		6,800	1,500	5,600	1,200	4,200	900	3,800	680	2,100	240
8.0		5,200	1,600	4,400	1,300	3,200	950	2,800	650	1,600	250
10.0		4,200	1,500	3,500	1,200	2,600	800	2,300	600	1,300	210
12.0		3,500	1,400	3,000	1,200	2,200	700	1,900	550	1,100	180
14.0		3,000	1,200	2,600	1,100	1,800	600	1,600	500	900	150
16.0		2,700	1,100	2,200	1,000	1,600	600	1,400	480	760	130
18.0		2,400	1,000	2,000	900	1,400	570	1,300	450	680	120
20.0		2,200	900	1,700	800	1,200	550	1,100	400	600	100
25.0		1,700	680	1,400	630	1,000	450	890	310	480	82
Standard Depth of Cut	ap	1.5DC									
	ae	0.2DC				0.05DC		0.1DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		13,000	750	10,000	550	8,400	500	6,500	300	4,000	140
4.0		8,200	800	6,000	600	5,200	500	4,000	330	2,000	130
6.0		6,100	1,100	4,000	600	3,500	580	2,700	350	1,350	150
8.0		4,600	1,000	3,000	580	2,600	570	2,000	330	1,000	140
10.0		3,600	1,000	2,400	550	2,100	510	1,600	200	800	130
12.0		3,100	920	2,000	500	1,700	450	1,300	280	660	110
14.0		2,600	750	1,700	450	1,500	400	1,100	250	570	100
16.0		2,300	670	1,500	420	1,300	350	1,000	230	500	90
18.0		2,000	620	1,300	380	1,100	330	900	200	430	80
20.0		1,900	600	1,200	360	1,000	320	800	180	380	70
25.0		1,500	470	1,000	300	790	250	640	140	300	55
Standard Depth of Cut	ap	0.8DC				0.16DC		0.4DC		0.16DC	

GSXVL 4000-2.5D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Corner | Helix Angle 40° 43° | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping

Fig 1

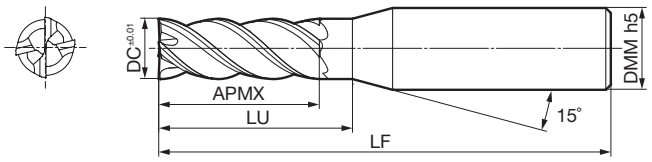
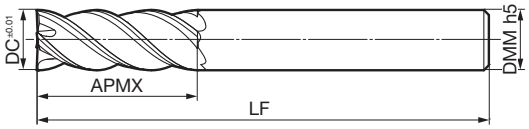


Fig 2



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSXVL 4020-2.5D	●	**2.0**	5	6.5	50	4	1
4030-2.5D	●	**3.0**	8	9.5	50	6	1
4040-2.5D	●	**4.0**	10	11.5	50	6	1
4050-2.5D	●	**5.0**	13	14.5	60	6	1
4060-2.5D	●	**6.0**	15	—	60	6	2
GSXVL 4070-2.5D	●	**7.0**	18	20.0	70	8	1
4080-2.5D	●	**8.0**	20	—	80	8	2
4090-2.5D	●	**9.0**	23	25.0	90	10	1
4100-2.5D	●	**10.0**	25	—	90	10	2
4110-2.5D	●	**11.0**	28	30.5	90	12	1
GSXVL 4120-2.5D	●	**12.0**	30	—	90	12	2
4140-2.5D	●	**14.0**	35	37.5	110	16	1
4150-2.5D	●	**15.0**	38	41.0	110	16	1
4160-2.5D	●	**16.0**	40	—	115	16	2
4180-2.5D	●	**18.0**	45	48.0	120	20	1
GSXVL 4200-2.5D	●	**20.0**	50	—	125	20	2
4250-2.5D		**25.0**	63	—	140	25	2

Grade: ACF20

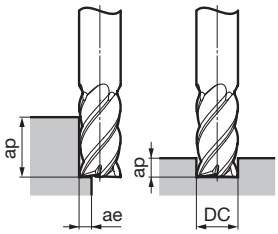
Identification Code

GSXVL 4 020 - 2.5D

- GSXVL — Series Code
- 4 — No. of Flutes
- 020 — Dia.
- 2.5D — Cutting Edge Length

For the regrinding procedure, please download the details from our website.
https://www.sumitool.com/en/products/cutting-tools/endmills/pdf/gsxvl-regrinding_en.pdf

GSXVL 4000-2.5D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		13,000	1,000	10,000	800	8,000	700	10,000	580	5,000	200
4.0		9,600	1,200	8,000	1,000	6,000	800	5,500	650	3,000	230
6.0		6,800	1,500	5,600	1,200	4,200	900	3,800	680	2,100	240
8.0		5,200	1,600	4,400	1,300	3,200	950	2,800	650	1,600	250
10.0		4,200	1,500	3,500	1,200	2,600	800	2,300	600	1,300	210
12.0		3,500	1,400	3,000	1,200	2,200	700	1,900	550	1,100	180
14.0		3,000	1,200	2,600	1,100	1,800	600	1,600	500	900	150
16.0		2,700	1,100	2,200	1,000	1,600	600	1,400	480	760	130
18.0		2,400	1,000	2,000	900	1,400	570	1,300	450	680	120
20.0		2,200	900	1,700	800	1,200	550	1,100	400	600	100
25.0		1,700	680	1,400	630	1,000	450	890	310	480	82
Standard Depth of Cut	ap	1.5DC									
	ae	0.2DC				0.05DC		0.1DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		13,000	750	10,000	550	8,400	500	6,500	300	4,000	140
4.0		8,200	800	6,000	600	5,200	500	4,000	330	2,000	130
6.0		6,100	1,100	4,000	600	3,500	580	2,700	350	1,350	150
8.0		4,600	1,000	3,000	580	2,600	570	2,000	330	1,000	140
10.0		3,600	1,000	2,400	550	2,100	510	1,600	200	800	130
12.0		3,100	920	2,000	500	1,700	450	1,300	280	660	110
14.0		2,600	750	1,700	450	1,500	400	1,100	250	570	100
16.0		2,300	670	1,500	420	1,300	350	1,000	230	500	90
18.0		2,000	620	1,300	380	1,100	330	900	200	430	80
20.0		1,900	600	1,200	360	1,000	320	800	180	380	70
25.0		1,500	470	1,000	300	790	250	640	140	300	55
Standard Depth of Cut	ap	1.0DC				0.2DC		0.5DC		0.2DC	

SSUP 4000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | ZX Coat | Corner | 40° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping

Fig 1

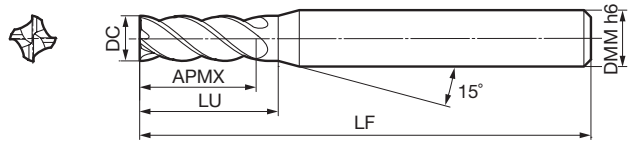
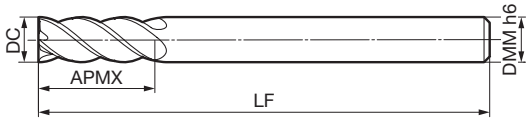


Fig 2



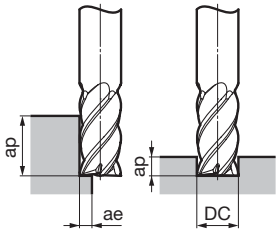
DC	Tolerance
D ≤ 3.0	-0.014 -0.028
3.0 < D ≤ 6.0	-0.020 -0.038
6.0 < D	-0.025 -0.047

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSUP 4020ZX	●	**2.0**	6.0	7.0	50	4	1
4030ZX	●	**3.0**	8.0	9.5	50	6	1
4040ZX	●	**4.0**	11.0	12.5	50	6	1
4050ZX	●	**5.0**	13.0	14.5	60	6	1
4060ZX	●	**6.0**	13.0	—	60	6	2
SSUP 4070ZX	●	**7.0**	16.0	18.0	70	8	1
4080ZX	●	**8.0**	19.0	—	80	8	2
4090ZX	●	**9.0**	19.0	21.5	90	10	1
4100ZX	●	**10.0**	22.0	—	90	10	2
4110ZX	●	**11.0**	22.0	24.5	90	12	1
SSUP 4120ZX	●	**12.0**	26.0	—	90	12	2
4140ZX	●	**14.0**	26.0	28.5	110	16	1
4150ZX	●	**15.0**	26.0	28.5	110	16	1
4160ZX	●	**16.0**	32.0	—	115	16	2
4180ZX	●	**18.0**	32.0	34.5	120	20	1
SSUP 4200ZX	●	**20.0**	38.0	—	125	20	2

Grade: ACZ50M



Recommended Cutting Conditions

1. For Groove milling of stainless steel, use 60% of the recommended spindle speed and 40% of the recommended feed rate. (*)
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Side Milling and Groove Milling

Work Material / Cutting Conditions / DC (mm)		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel (*)		Heat-Resistant Alloy Titanium Alloy (20 to 45HRC)	
		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
2.0		9,000	720	6,000	430	4,000	320	5,500	320	2,600	120
4.0		6,600	800	4,500	450	3,000	380	4,000	320	2,000	120
6.0		4,800	960	3,000	480	2,500	380	3,000	480	1,200	120
8.0		3,600	1,000	2,200	610	2,000	400	2,000	520	1,000	140
10.0		2,800	1,000	1,800	610	1,500	400	1,700	550	800	160
12.0		2,400	950	1,500	550	1,200	380	1,500	500	700	140
14.0		2,200	880	1,300	490	1,000	360	1,200	430	600	130
16.0		1,800	650	1,100	420	800	300	1,000	360	500	120
18.0		1,600	580	1,000	360	750	270	900	340	450	110
20.0		1,400	500	900	330	700	250	820	300	400	100
Side Milling	ap	1.5DC									
	ae	0.1DC				0.05DC		0.1DC		0.05DC	
Groove Milling	ap	1.0DC				0.2DC		0.3DC		0.2DC	

SSUPR 4000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling

Fig 1

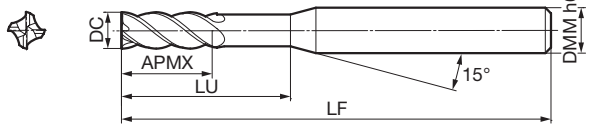


Fig 2

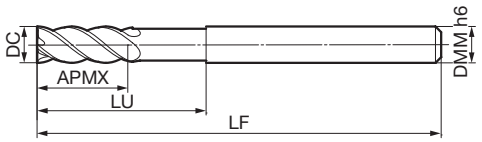
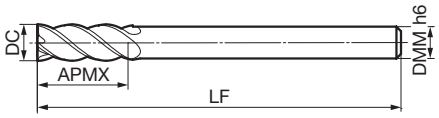


Fig 3



DC	Tolerance
D ≤ 3.0	-0.014 -0.028
3.0 < D ≤ 6.0	-0.020 -0.038
6.0 < D	-0.025 -0.047

Body

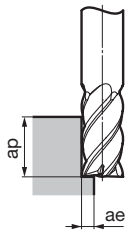
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSUPR 4030ZX	●	**3.0**	4.5	12	60	6	1
4040ZX	●	**4.0**	6.0	16	60	6	1
4050ZX	●	**5.0**	7.5	20	60	6	1
4060ZX	●	**6.0**	9.0	24	60	6	2
4070ZX	●	**7.0**	10.5	—	80	6	3
SSUPR 4080ZX	●	**8.0**	12.0	34	80	8	2
4090ZX	●	**9.0**	13.5	—	90	8	3
4100ZX	●	**10.0**	15.0	42	100	10	2
4110ZX	●	**11.0**	16.5	—	120	10	3
4120ZX	●	**12.0**	18.0	50	120	12	2
SSUPR 4130ZX	●	**13.0**	19.5	—	130	12	3
4160ZX	●	**16.0**	24.0	66	160	16	2
4170ZX	●	**17.0**	25.5	—	170	16	3
4200ZX	●	**20.0**	30.0	82	200	20	2

Grade: ACZ50M

Recommended Cutting Conditions

1. The conditions recommended are for endmills with standard overhang lengths of 4xD. For overhangs of 5xD or more, please use 70% (max) of recommended conditions.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

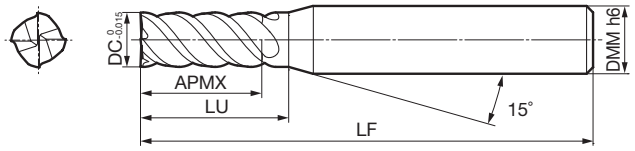
Work Material / Cutting Conditions		Carbon Steel, Cast Iron (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel		Heat-Resistant Alloy Titanium Alloy (20 to 45HRC)	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
3.0		9,000	600	5,300	400	3,100	200	4,200	350	2,600	160
4.0		6,600	600	4,000	400	2,400	200	3,200	350	2,000	160
6.0		4,200	600	2,600	400	1,600	200	2,100	350	1,300	160
8.0		3,200	650	2,000	450	1,200	200	1,600	350	1,000	160
10.0		2,500	650	1,600	450	950	200	1,200	400	800	180
12.0		2,100	650	1,300	450	800	200	1,000	400	650	180
13.0		1,900	650	1,200	450	700	200	950	400	600	180
16.0		1,600	650	1,000	400	600	200	800	350	500	160
17.0		1,500	600	900	400	550	200	750	350	450	160
20.0		1,200	600	800	400	500	200	650	350	400	160
Standard Depth of Cut	ap	1.2DC									
	ae	0.1DC				0.05DC		0.1DC		0.05DC	

GSH 4000SF type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

4 Flutes | GS HARD Coat | Corner | 50° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling

Fig 1



Body (4 Flutes)

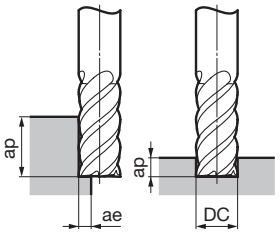
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSH 4010SF	●	**1.0**	3.0	4.0	50	6	1
4015SF	●	**1.5**	4.0	5.0	50	6	1
4020SF	●	**2.0**	6.0	7.0	50	6	1

Grade: ACF07C

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling and Groove Milling

Work Material / Cutting Conditions / DC (mm)		Low Hardened Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)		Hardened Steel SKH55 (65HRC up)	
		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
1.0		20,000	540	20,000	390	15,600	260	12,300	160	11,100	140	7,800	95
2.0		19,000	1,100	17,200	770	13,400	530	10,500	320	9,500	270	6,700	190
Side Milling	ap	1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC	
	ae	0.1DC		0.1DC		0.05DC		0.05DC		0.02DC		0.02DC	
Groove Milling	ap	0.1DC		0.1DC		0.05DC		0.05DC		Up to 0.05DC Max. 0.5mm		Up to 0.05DC Max. 0.5mm	

Side Milling (Using High Speed Machining Centre)

Work Material / Cutting Conditions / DC (mm)		Low Hardened Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)	
		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
1.0		48,000	1,250	48,000	1,250	48,000	1,250	48,000	930	38,000	700
2.0		48,000	2,850	48,000	2,850	48,000	2,850	36,000	1,600	24,000	1,000
Standard Depth of Cut	ap	1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC	
	ae	0.1DC		0.05DC		0.05DC		0.02DC		0.01DC	

GSH 6000SF type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

6 Flutes | GS HARD Coat | Corner | Helix Angle 50° | Shoulder Milling | Groove Finishing | Face Milling

Fig 1

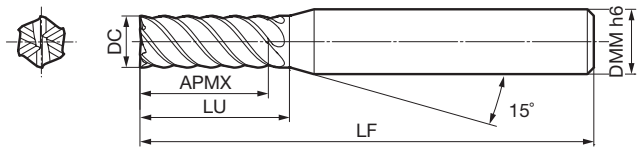
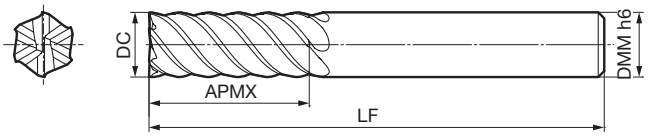


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D	0 -0.030

Body (6 Flutes)

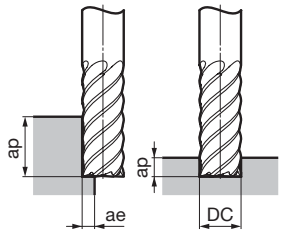
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSH 6030SF	●	**3.0**	8.0	9.0	50	6	1
6040SF	●	**4.0**	11.0	12.0	50	6	1
6050SF	●	**5.0**	13.0	14.0	50	6	1
6060SF	●	**6.0**	13.0	—	50	6	2
6080SF	●	**8.0**	19.0	—	60	8	2
GSH 6100SF	●	**10.0**	22.0	—	70	10	2
6120SF	●	**12.0**	26.0	—	75	12	2

Grade: ACF07C

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling and Groove Milling

Work Material / Cutting Conditions		Low Hardened Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)		Hardened Steel SKH55 (65HRC up)	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
3.0		15,000	2,150	13,400	1,540	10,400	1,050	8,200	650	7,400	540	5,200	380
4.0		11,200	2,400	10,000	1,740	7,800	1,180	6,100	730	5,600	600	3,900	420
5.0		9,000	2,700	8,000	1,930	6,200	1,300	4,900	810	4,400	670	3,100	470
6.0		7,500	2,700	6,700	1,930	5,200	1,300	4,100	810	3,700	670	2,600	470
8.0		5,600	2,700	5,000	1,930	3,900	1,300	3,050	810	2,800	670	1,950	470
10.0		4,500	2,700	4,000	1,930	3,100	1,300	2,450	810	2,200	670	1,550	470
12.0		3,750	2,700	3,350	1,930	2,600	1,300	2,050	810	1,850	670	1,300	470
Side Milling	ap	1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC	
	ae	0.1DC		0.1DC		0.05DC		0.05DC		0.02DC		0.02DC	
Groove Milling	ap	0.1DC		0.1DC		0.05DC		0.05DC		Up to 0.05DC Max. 0.5mm		Up to 0.05DC Max. 0.5mm	

Side Milling (Using High Speed Machining Centre)

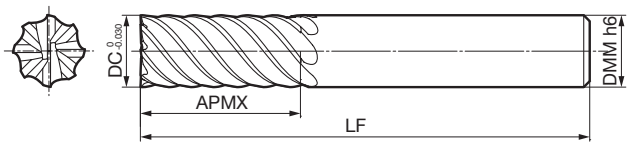
Work Material / Cutting Conditions		Low Hardened Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
3.0		32,000	4,900	32,000	4,900	32,000	4,900	24,000	2,740	16,000	1,700
4.0		24,000	5,200	24,000	5,200	24,000	5,200	18,000	2,900	12,000	1,800
5.0		19,200	5,800	19,200	5,800	19,200	5,800	14,300	3,200	9,600	2,000
6.0		16,000	5,800	16,000	5,800	16,000	5,800	12,000	3,200	8,000	2,000
8.0		12,000	5,800	12,000	5,800	12,000	5,800	9,000	3,200	6,000	2,000
10.0		9,600	5,800	9,600	5,800	9,600	5,800	7,200	3,200	4,800	2,000
12.0		8,000	5,800	8,000	5,800	8,000	5,800	6,000	3,200	4,000	2,000
Standard Depth of Cut	ap	1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC	
	ae	0.1DC		0.05DC		0.05DC		0.02DC		0.01DC	

GSH 8000SF type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

8 Flutes | GS HARD Coat | Corner | 50° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling

Fig 1



Body (8 Flutes)

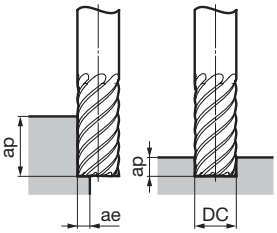
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
GSH 8160SF	●	**16.0**	32.0	90	16	1
8200SF	●	**20.0**	38.0	100	20	1

Grade: ACF07C

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling and Groove Milling

Work Material / Cutting Conditions		Low Hardened Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)		Hardened Steel SKH55 (65HRC up)	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
16.0		2,800	2,500	2,500	1,800	1,950	1,220	1,530	760	1,400	630	980	440
20.0		2,250	2,100	2,000	1,540	1,550	1,050	1,230	650	1,100	540	780	380
Side Milling	ap	1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC	
	ae	0.1DC		0.1DC		0.05DC		0.05DC		0.02DC		0.02DC	
Groove Milling	ap	0.1DC		0.1DC		0.05DC		0.05DC		Up to 0.05DC Max. 0.5mm		Up to 0.05DC Max. 0.5mm	

Side Milling (Using High Speed Machining Centre)

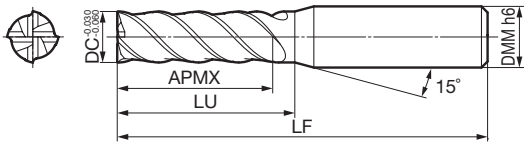
Work Material / Cutting Conditions		Low Hardened Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
16.0		6,000	5,400	6,000	5,400	6,000	5,400	4,500	3,000	3,000	1,900
20.0		4,800	4,600	4,800	4,600	4,800	4,600	3,600	2,580	2,400	1,600
Standard Depth of Cut	ap	1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC		1 to 1.5DC	
	ae	0.1DC		0.05DC		0.05DC		0.02DC		0.01DC	

HHM 4000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

4 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Face Milling

Fig 1



Body (4 Flutes)

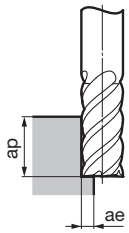
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
HHM 4030ZX	●	**3.0**	8.0	11.0	50	6	1
4040ZX	●	**4.0**	10.0	13.0	50	6	1
4050ZX	●	**5.0**	12.0	15.0	50	6	1

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

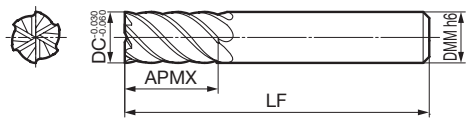
Work Material / Cutting Conditions / DC (mm)		Carbon Steel / Alloy Steel (Below 25HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Hardened Steel (Below 65HRC)		Cast Iron Special Cast Iron	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
3.0		16,500	2,000	14,700	1,750	8,200	600	16,500	2,000
4.0		12,300	2,000	11,000	1,750	6,100	600	12,300	2,000
5.0		9,800	2,000	8,800	1,750	4,900	600	9,800	2,000
Standard Depth of Cut	ap	1.5DC		1.5DC		1.0DC		1.5DC	
	ae	0.1DC		0.1DC		0.02DC		0.1DC	

HHM 6000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

6 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Face Milling

Fig 1



Body (6 Flutes)

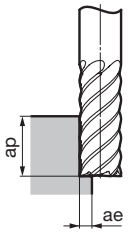
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
HHM 6060ZX	●	**6.0**	12.0	50	6	1
6080ZX	●	**8.0**	16.0	60	8	1
6100ZX	●	**10.0**	20.0	71	10	1
6120ZX	●	**12.0**	24.0	75	12	1

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

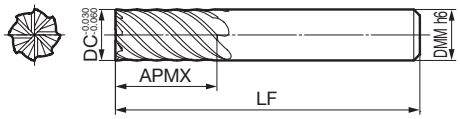
Work Material / Cutting Conditions		Carbon Steel / Alloy Steel (Below 25HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Hardened Steel (Below 65HRC)		Cast Iron Special Cast Iron	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
6.0		8,200	2,900	7,300	2,600	4,100	900	8,200	2,900
8.0		6,100	2,900	5,500	2,600	3,100	900	6,100	2,900
10.0		4,900	2,900	4,400	2,600	2,500	900	4,900	2,900
12.0		4,100	2,900	3,650	2,600	2,100	900	4,100	2,900
Standard Depth of Cut	ap	1.5DC		1.5DC		1.0DC		1.5DC	
	ae	0.1DC		0.1DC		0.02DC		0.1DC	

HHM 8000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

8 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Face Milling

Fig 1



Body (8 Flutes)

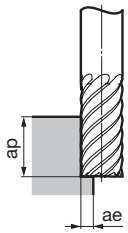
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
HHM 8160ZX	●	**16.0**	32	90	16	1
8200ZX	●	**20.0**	40	106	20	1
8320ZX	●	**32.0**	64	130	32	1

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

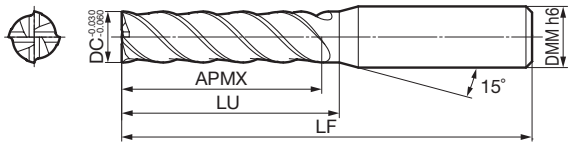
Work Material / Cutting Conditions / DC (mm)		Carbon Steel / Alloy Steel (Below 25HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Hardened Steel (Below 65HRC)		Cast Iron Special Cast Iron	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
16.0		3,100	3,500	2,750	3,200	1,550	1,100	3,100	3,500
20.0		2,500	3,150	2,200	2,800	1,250	950	2,500	3,150
32.0		1,550	2,400	1,350	1,950	780	700	1,550	2,400
Standard Depth of Cut	ap	1.5DC		1.5DC		1.0DC		1.5DC	
	ae	0.1DC		0.1DC		0.02DC		0.1DC	

LHHM 4000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

4 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Face Milling

Fig 1



Body (4 Flutes)

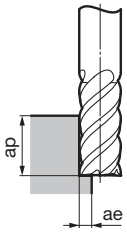
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
LHHM 4030ZX	●	**3.0**	12.0	15.0	55	6	1
4040ZX	●	**4.0**	15.0	17.9	60	6	1
4050ZX	●	**5.0**	18.0	21.0	60	6	1

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

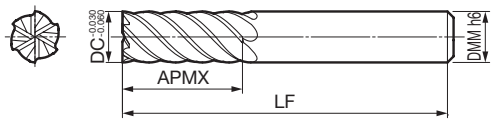
Work Material / Cutting Conditions		Carbon Steel / Alloy Steel (Below 25HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Hardened Steel (Below 65HRC)		Cast Iron Special Cast Iron	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
3.0		16,500	1,500	14,700	1,300	8,200	450	16,500	1,500
4.0		12,300	1,500	11,000	1,300	6,100	450	12,300	1,500
5.0		9,800	1,500	8,800	1,300	4,900	450	9,800	1,500
Standard Depth of Cut	ap	2.0DC		2.0DC		1.5DC		2.0DC	
	ae	0.1DC		0.1DC		0.02DC		0.1DC	

LHHM 6000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

6 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Face Milling

Fig 1



Body (6 Flutes)

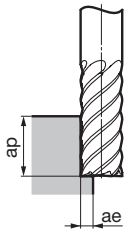
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
LHHM 6060ZX	●	**6.0**	18.0	60	6	1
6080ZX	●	**8.0**	25.0	75	8	1
6100ZX	●	**10.0**	30.0	80	10	1
6120ZX	●	**12.0**	30.0	100	12	1

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

Work Material / Cutting Conditions / DC (mm)		Carbon Steel / Alloy Steel (Below 25HRC) Spindle Speed (min⁻¹)	Carbon Steel / Alloy Steel (Below 25HRC) Feed Rate (mm/min)	Carbon Steel / Alloy Steel (Below 45HRC) Spindle Speed (min⁻¹)	Carbon Steel / Alloy Steel (Below 45HRC) Feed Rate (mm/min)	Hardened Steel (Below 65HRC) Spindle Speed (min⁻¹)	Hardened Steel (Below 65HRC) Feed Rate (mm/min)	Cast Iron Special Cast Iron Spindle Speed (min⁻¹)	Cast Iron Special Cast Iron Feed Rate (mm/min)
6.0		8,200	2,200	7,300	2,000	4,150	700	8,200	2,200
8.0		6,100	2,200	5,500	2,000	3,100	700	6,100	2,200
10.0		4,900	2,200	4,400	2,000	2,500	700	4,900	2,200
12.0		4,100	2,200	3,700	2,000	2,100	700	4,100	2,200
Standard Depth of Cut	ap	2.0DC		2.0DC		1.5DC		2.0DC	
	ae	0.1DC		0.1DC		0.02DC		0.1DC	

LHHM 8000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

8 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Face Milling

Fig 1

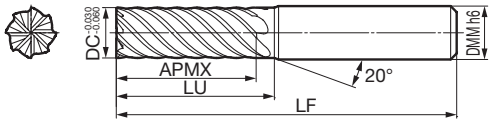
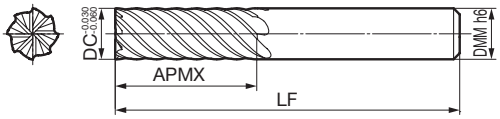


Fig 2



Body (8 Flutes)

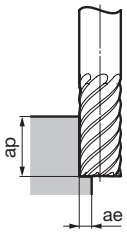
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
LHHM 8160ZX	●	**16.0**	50.0	—	105	16	2
8200ZX	●	**20.0**	55.0	—	120	20	2
8250ZX	●	**25.0**	65.0	—	140	25	2
8300ZX	●	**30.0**	75.0	86.5	160	32	1
8320ZX	●	**32.0**	85.0	—	170	32	2

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

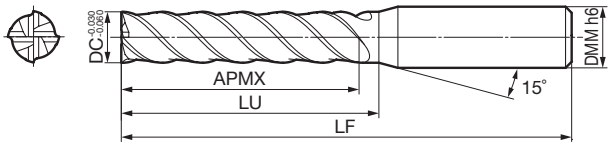
Work Material / Cutting Conditions		Carbon Steel / Alloy Steel (Below 25HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Hardened Steel (Below 65HRC)		Cast Iron Special Cast Iron	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
16.0		3,100	2,700	2,750	2,400	1,550	800	3,100	2,700
20.0		2,500	2,400	2,200	2,100	1,250	700	2,500	2,400
25.0		2,000	2,100	1,750	1,700	1,000	600	2,000	2,000
32.0		1,550	1,800	1,350	1,500	780	550	1,550	1,800
Standard Depth of Cut	ap	2.0DC		2.0DC		1.5DC		2.0DC	
	ae	0.1DC		0.1DC		0.02DC		0.1DC	

EHHM 4000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

4 Flutes | ZX Coat | Corner | Helix Angle 45° | Shoulder Milling | Face Milling

Fig 1



Body (4 Flutes)

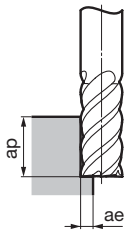
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
EHHM 4030ZX	●	**3.0**	20.0	23.0	60	6	1
4040ZX	●	**4.0**	25.0	27.9	65	6	1
4050ZX	●	**5.0**	30.0	33.0	70	6	1

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

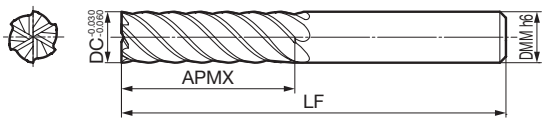
Work Material / Cutting Conditions / DC (mm)		Carbon Steel / Alloy Steel (Below 25HRC) Spindle Speed (min⁻¹)	Carbon Steel / Alloy Steel (Below 25HRC) Feed Rate (mm/min)	Carbon Steel / Alloy Steel (Below 45HRC) Spindle Speed (min⁻¹)	Carbon Steel / Alloy Steel (Below 45HRC) Feed Rate (mm/min)	Hardened Steel (Below 65HRC) Spindle Speed (min⁻¹)	Hardened Steel (Below 65HRC) Feed Rate (mm/min)	Cast Iron Special Cast Iron Spindle Speed (min⁻¹)	Cast Iron Special Cast Iron Feed Rate (mm/min)
3.0		5,800	700	4,600	400	1,800	90	5,800	700
4.0		4,400	650	3,500	400	1,350	100	4,400	650
5.0		3,500	600	2,800	400	1,100	110	3,500	600
Standard Depth of Cut	ap	2.0DC		2.0DC		2.0DC		2.0DC	
	ae	0.05DC		0.02DC		0.01DC		0.05DC	

EHHM 6000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

6 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Face Milling

Fig 1



Body (6 Flutes)

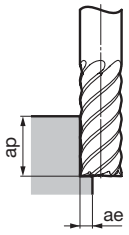
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
EHHM 6060ZX	●	**6.0**	30.0	70	6	1
6080ZX	●	**8.0**	40.0	90	8	1
6100ZX	●	**10.0**	50.0	100	10	1
6120ZX	●	**12.0**	50.0	120	12	1

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

Work Material / Cutting Conditions		Carbon Steel / Alloy Steel (Below 25HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Hardened Steel (Below 65HRC)		Cast Iron Special Cast Iron	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
6.0		2,900	810	2,300	590	900	160	2,900	810
8.0		2,400	860	2,000	620	800	170	2,400	860
10.0		2,100	920	1,800	650	700	170	2,100	920
12.0		1,750	880	1,500	580	600	170	1,750	880
Standard Depth of Cut	ap	2.0DC		2.0DC		2.0DC		2.0DC	
	ae	0.05DC		0.02DC		0.01DC		0.05DC	

EHHM 8000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC

8 Flutes | ZX Coat | Corner | 45° Helix Angle | Shoulder Milling | Face Milling

Fig 1

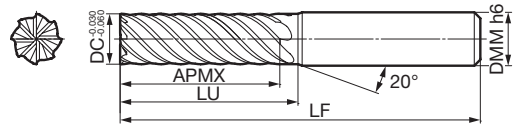
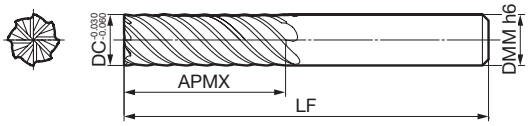


Fig 2



Body (8 Flutes)

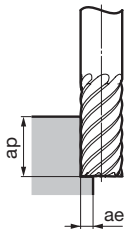
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
EHHM 8160ZX	●	**16.0**	70.0	—	140	16	2
8200ZX	●	**20.0**	85.0	—	165	20	2
8250ZX	●	**25.0**	100.0	—	185	25	2
8300ZX	●	**30.0**	110.0	121.5	205	32	1
8320ZX	●	**32.0**	110.0	—	205	32	2

Grade: ACZ10M

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

Work Material / Cutting Conditions / DC (mm)		Carbon Steel / Alloy Steel (Below 25HRC)		Carbon Steel / Alloy Steel (Below 45HRC)		Hardened Steel (Below 65HRC)		Cast Iron Special Cast Iron	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
16.0		1,350	1,000	1,100	600	450	190	1,350	1,000
20.0		1,100	850	900	520	350	160	1,100	850
25.0		850	700	700	420	300	150	850	700
32.0		680	580	550	350	220	120	680	580
Standard Depth of Cut	ap	2.0DC		2.0DC		2.0DC		2.0DC	
	ae	0.05DC		0.02DC		0.01DC		0.05DC	

GSRE 4000SF type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GS Coat | Corner | 40° Helix Angle | Shoulder Milling | Groove Milling | Face Milling | Helical Milling | Ramping

Fig 1

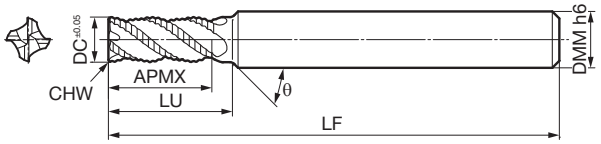
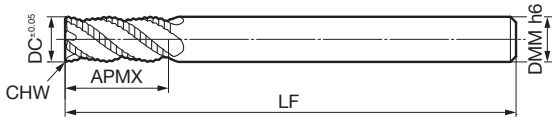


Fig 2



DC	θ
ø11 or less	45°
> ø12	20°

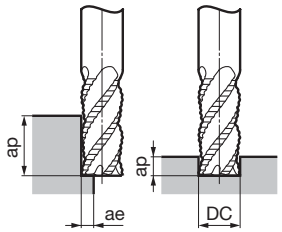
Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Chamfer CHW	Shank Dia. DMM	Fig
GSRE 4060SF	●	**6.0**	13.0	—	50	0.3	6	2
4070SF	●	**7.0**	16.0	19.0	60	0.3	8	1
4080SF	●	**8.0**	19.0	—	60	0.4	8	2
4090SF	●	**9.0**	19.0	22.0	70	0.4	10	1
4100SF	●	**10.0**	22.0	—	70	0.5	10	2
GSRE 4110SF	●	**11.0**	22.0	25.0	75	0.5	12	1
4120SF	●	**12.0**	26.0	—	75	0.6	12	2
4140SF	●	**14.0**	26.0	30.0	90	0.6	16	1
4160SF	●	**16.0**	32.0	—	90	0.8	16	2
4180SF	●	**18.0**	32.0	40.0	100	0.8	20	1
GSRE 4200SF	●	**20.0**	38.0	—	100	1.0	20	2

Grade: ACZ20W

GSRE 4000SF type



Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Side Milling

Work Material / Cutting Conditions		Structural Steel, Carbon Steel (150 to 250HB)		Cast Iron FC, FCD		Alloy Steel (25 to 35HRC)		Hardened Steel (45 to 50HRC)		Stainless Steel SUS304, SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
6.0		4,800	1,200	5,800	1,500	3,200	380	2,600	400	5,300	250	1,600	90
7.0		4,100	1,200	5,000	1,500	2,700	380	2,200	400	4,500	250	1,350	90
8.0		3,600	1,200	4,500	1,500	2,400	380	2,000	400	4,000	250	1,250	90
9.0		3,200	1,200	4,000	1,500	2,100	380	1,800	400	3,500	250	1,050	90
10.0		2,800	1,200	3,500	1,500	1,900	380	1,600	400	3,200	250	1,000	100
11.0		2,600	1,200	3,000	1,400	1,700	380	1,500	400	2,900	250	900	100
12.0		2,400	1,200	2,900	1,400	1,600	400	1,300	400	2,600	250	800	100
14.0		2,200	1,100	2,600	1,300	1,300	380	1,100	350	2,200	200	700	100
16.0		1,800	900	2,200	1,100	1,200	380	1,000	350	2,000	180	600	100
18.0		1,400	700	1,800	900	1,000	380	900	300	1,800	150	550	100
20.0		1,400	700	1,700	850	850	380	800	300	1,600	150	500	100
Standard Depth of Cut	ap	1.5DC											
	ae	0.5DC						0.3DC					

Groove Milling

Work Material / Cutting Conditions		Structural Steel, Carbon Steel (150 to 250HB)		Cast Iron FC, FCD		Alloy Steel (25 to 35HRC)		Hardened Steel (45 to 50HRC)		Stainless Steel SUS304, SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
6.0		3,600	900	4,300	1,100	2,400	300	1,700	260	4,200	250	1,100	60
7.0		3,000	900	3,700	1,100	2,000	280	1,500	260	3,600	250	900	60
8.0		2,700	900	3,400	1,100	1,800	280	1,350	260	3,200	250	800	60
9.0		2,400	900	3,000	1,100	1,600	280	1,200	260	2,800	250	700	60
10.0		2,100	900	2,600	1,100	1,400	280	1,100	270	2,500	250	650	65
11.0		2,000	900	2,300	1,100	1,300	280	1,000	270	2,300	250	600	70
12.0		1,800	900	2,200	1,100	1,200	300	900	270	2,100	250	550	70
14.0		1,600	800	2,000	1,000	1,000	290	750	240	1,800	180	450	65
16.0		1,350	650	1,650	850	900	280	700	240	1,600	160	400	65
18.0		1,200	550	1,500	750	800	280	600	230	1,400	140	350	60
20.0		1,050	500	1,350	700	700	280	550	210	1,250	125	300	60
Standard Depth of Cut	ap	1.0DC						0.5DC					

ASM 2000DL type

Aluminum Alloy | Copper Alloy

2 Flutes | AURORA Coat DLC | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing | Helical Milling | Ramping

Fig 1

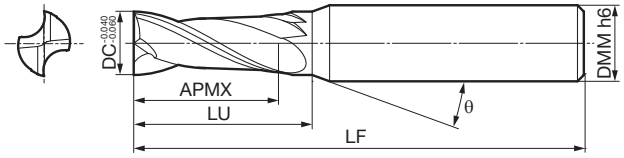


Fig 2

DC	θ
< ø3	10°
≥ ø3	15°

Body

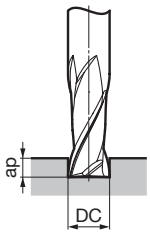
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
ASM 2020DL	●	**2.0**	6.0	6.8	40	4	1
2030DL	●	**3.0**	10.0	12.9	45	6	1
2040DL	●	**4.0**	12.0	14.7	45	6	1
2050DL	●	**5.0**	15.0	18.6	50	6	1
2060DL	●	**6.0**	15.0	—	50	6	2
ASM 2080DL	●	**8.0**	18.0	—	60	8	2
2100DL	●	**10.0**	22.0	—	71	10	2
2120DL	●	**12.0**	25.0	—	75	12	2
2160DL	●	**16.0**	32.0	—	90	16	2

Grade: DL1000

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Groove Milling

Work Material / Cutting Conditions		Aluminum Alloy			
		Wet		Dry	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		28,000	280	28,000	200
3.0		22,000	400	22,000	280
4.0		18,000	520	18,000	360
5.0		14,000	520	14,000	360
6.0		12,000	540	12,000	370
8.0		9,000	540	9,000	370
10.0		7,200	560	7,200	390
12.0		6,000	560	6,000	390
16.0		4,500	560	4,500	390
Standard Depth of Cut	ap	1.0DC		0.5DC	
	ae	1.0DC		1.0DC	

ASM 4000DL type

Aluminum Alloy | Copper Alloy

4 Flutes | AURORA Coat DLC | Corner | 30° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling | Helical Milling | Ramping

Fig 1

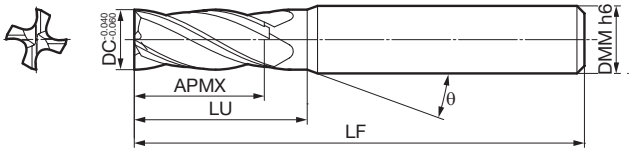
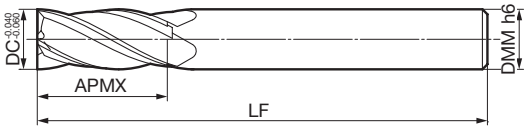


Fig 2



DC	θ
< ø3	10°
≥ ø3	15°

Body

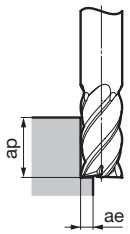
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
ASM 4020DL	●	**2.0**	6.0	6.8	40	4	1
4030DL	●	**3.0**	10.0	12.9	45	6	1
4040DL	●	**4.0**	12.0	14.7	45	6	1
4050DL	●	**5.0**	15.0	18.6	50	6	1
4060DL	●	**6.0**	15.0	—	50	6	2
ASM 4080DL	●	**8.0**	18.0	—	60	8	2
4100DL	●	**10.0**	22.0	—	71	10	2
4120DL	●	**12.0**	25.0	—	75	12	2
4160DL	●	**16.0**	32.0	—	90	16	2

Grade: DL1000

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

Work Material / Cutting Conditions / DC (mm)		Aluminum Alloy			
		Wet		Dry	
		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
2.0		40,000	1,400	40,000	980
3.0		32,000	2,000	32,000	1,400
4.0		26,000	2,600	26,000	1,800
5.0		20,000	2,600	20,000	1,800
6.0		17,000	2,700	17,000	1,900
8.0		13,000	2,700	13,000	1,900
10.0		11,000	2,800	11,000	2,000
12.0		8,500	2,800	8,500	2,000
16.0		6,400	2,800	6,400	2,000
Standard Depth of Cut	ap	1.5DC		1.5DC	
	ae	0.2DC		0.2DC	

ASM 2000 type

Aluminum Alloy | Copper Alloy

2 Flutes | Uncoated Carbide | Corner | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing | Helical Milling | Ramping

Fig 1

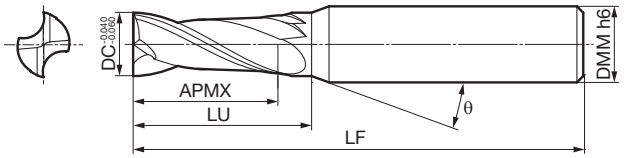
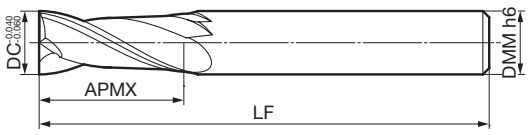


Fig 2



DC	θ
< ø3	10°
≥ ø3 < ø6	15°
> ø6	20°

Body

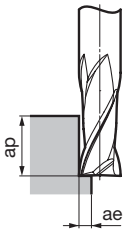
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
ASM 2020	●	**2.0**	6	6.8	40	4	1
2030	●	**3.0**	10	12.9	45	6	1
2040	●	**4.0**	12	14.7	45	6	1
2050	●	**5.0**	15	18.6	50	6	1
2060	●	**6.0**	15	—	50	6	2
ASM 2080	●	**8.0**	18	—	60	8	2
2100	●	**10.0**	22	—	71	10	2
2120	●	**12.0**	25	—	75	12	2
2140	●	**14.0**	32	44.2	90	16	1
2150	●	**15.0**	32	44.1	90	16	1
ASM 2160	●	**16.0**	32	—	90	16	2

Grade: H1

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling

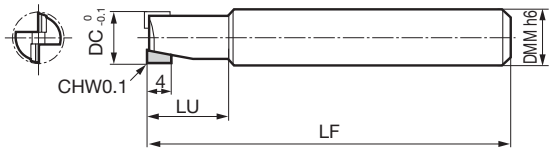
Work Material / Cutting Conditions		Aluminum Alloy		Cast Iron Special Cast Iron	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		35,000	460	13,000	240
3.0		23,400	770	8,750	275
4.0		17,500	800	6,550	310
6.0		11,700	910	4,370	340
8.0		8,750	980	3,280	390
10.0		7,000	1,100	2,620	400
12.0		5,850	1,150	2,185	430
16.0		4,380	1,150	1,640	430
Standard Depth of Cut	ap	1.5DC		1.5DC	
	ae	0.1DC		0.1DC	

DFE series

Aluminum Alloy | Copper Alloy | Graphite

2 Flutes | PCD | Shoulder Milling | Face Milling

Fig 1

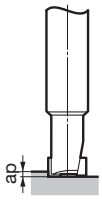


Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
DFE 2040S	●	**4.0**	15	50	6	1
2050S	●	**5.0**	15	50	6	1
2080S	●	**8.0**	15	60	10	1
2090S	●	**9.0**	15	70	10	1
2100S	●	**10.0**	15	70	10	1

Grade: DA2200



Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Face Milling (2 Flutes)

Work Material / Cutting Conditions		Aluminum Alloy Copper Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.0		40,000	4,000
5.0		32,000	3,200
8.0		20,000	2,000
9.0		17,800	1,780
10.0		16,000	1,600
Standard Depth of Cut	ap	0.4DC	

DFE series

Aluminum Alloy | Copper Alloy | Graphite

4 Flutes | PCD | Shoulder Milling | Face Milling

Fig 1

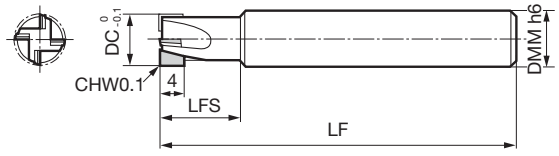
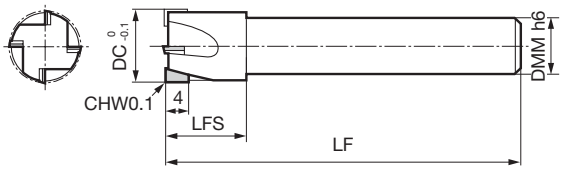


Fig 2

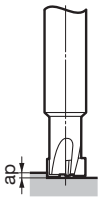


Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Neck Length LFS	Overall Length LF	Shank Dia. DMM	Fig
DFE 4090S	●	**9.0**	15	70	10	1
4100S	●	**10.0**	15	70	10	1
4130GS	●	**13.0**	15	70	10	2

Grade: DA2200



Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

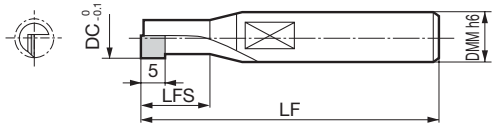
Face Milling (4 Flutes)

Work Material / Cutting Conditions		Aluminum Alloy Copper Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)
9.0		17,800	3,560
10.0		16,000	3,200
13.0		12,300	2,460
Standard Depth of Cut	ap	0.4DC	

DAE series

1 Flute | PCD | Shoulder Milling | Face Milling

Fig 1



Body

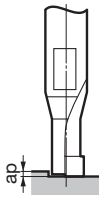
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Neck Length LFS	Overall Length LF	Shank Dia. DMM	Fig
DAE 1040	●	**4.0**	10	45	6	1
1050	●	**5.0**	12	50	6	1

Grade: DA200

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Face Milling (1 Flute)

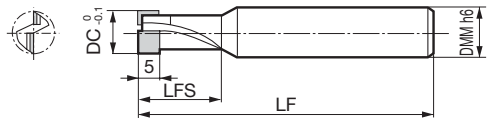
Work Material / Cutting Conditions		Aluminum Alloy Copper Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.0		6,000	210
5.0		5,000	175
Standard Depth of Cut	ap	0.4DC	

DAE series

Aluminum Alloy | Copper Alloy | Graphite

2 Flutes | PCD | Shoulder Milling | Face Milling

Fig 1

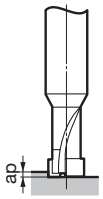


Body (2 Flutes)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Neck Length LFS	Overall Length LF	Shank Dia. DMM	Fig
DAE 2060	●	**6.0**	20	50	6	1
2070	●	**7.0**	20	60	8	1
2080	●	**8.0**	20	60	8	1
2090	●	**9.0**	25	71	10	1
2100	●	**10.0**	25	71	10	1
DAE 2110	●	**11.0**	25	75	12	1
2120	●	**12.0**	25	75	12	1

Grade: DA200



Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Face Milling (2 Flutes)

Work Material / Cutting Conditions		Aluminum Alloy Copper Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)
6.0		6,400	580
7.0		5,500	500
8.0		5,400	500
9.0		5,300	480
10.0		4,800	440
11.0		4,400	400
12.0		4,000	360
Standard Depth of Cut	ap	0.4DC	

SSDC 4000(RL) type

Graphite | CFRP | GFRP

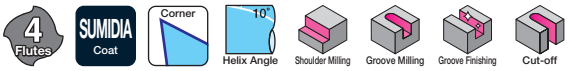
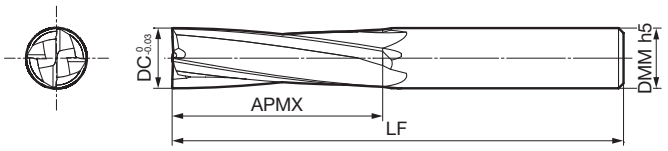


Fig 1



Body (Right-hand Helix type)

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
SSDC 4060	●	**6.0**	20	70	6	1
4080	●	**8.0**	30	80	8	1
4100	●	**10.0**	30	90	10	1
4120	●	**12.0**	30	100	12	1

Grade: DCX20

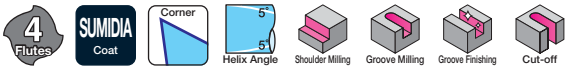
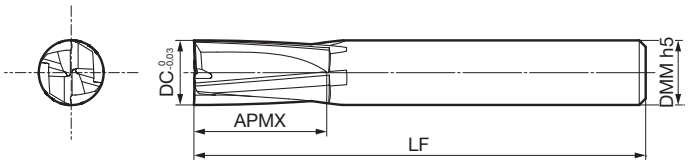


Fig 2



Body (Right-Left-hand Helix type)

Dimensions (mm)

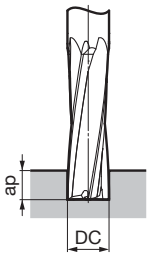
Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
SSDC 4060RL	●	**6.0**	20	70	6	2
4080RL	●	**8.0**	30	80	8	2
4100RL	●	**10.0**	30	90	10	2
4120RL	●	**12.0**	30	100	12	2

Grade: DCX20

Identification Code

SSDC 4 060 RL

Series Code	No. of Flutes	Dia.	Helix Shape (RL: Right-Left-hand Helix)



Recommended Cutting Conditions

1. The cutting conditions are guidelines.
   Cutting conditions are greatly influenced by clamping, work material grade, work material thickness and machine rigidity. Adjust the conditions accordingly.
2. Take sufficient dust control measures.
3. When radial depth of cut is 0.7D or more in groove milling and trimming, reduce feed rate accordingly.

Groove Milling (Common)

Work Material / Cutting Conditions	CFRP			
	Dry			
DC (mm)	Cutting Speed (m/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Feed Rate (mm/rev)
6.0	197.8	10,500	940	0.090
8.0	201.0	8,000	800	0.100
10.0	204.1	6,500	720	0.111
12.0	207.2	5,500	670	0.122

GSX 40000-R-2D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Radius | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping | Profiling

Fig 1

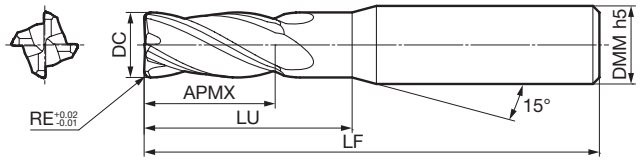
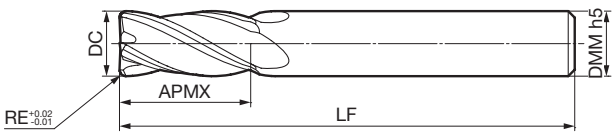


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D	0 -0.03

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Corner Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSX 40300-R02-2D	●	**3.0**	0.2	8.0	9.5	45	6	1
40300-R05-2D	●	**3.0**	0.5	8.0	9.5	45	6	1
40400-R02-2D	●	**4.0**	0.2	11.0	14.0	45	6	1
40400-R05-2D	●	**4.0**	0.5	11.0	14.0	45	6	1
40400-R10-2D	●	**4.0**	1.0	11.0	14.0	45	6	1
GSX 40500-R02-2D	●	**5.0**	0.2	13.0	19.6	50	6	1
40500-R05-2D	●	**5.0**	0.5	13.0	19.6	50	6	1
40500-R10-2D	●	**5.0**	1.0	13.0	19.6	50	6	1
40600-R02-2D	●	**6.0**	0.2	13.0	—	50	6	2
40600-R05-2D	●	**6.0**	0.5	13.0	—	50	6	2
GSX 40600-R10-2D	●	**6.0**	1.0	13.0	—	50	6	2
40600-R15-2D	●	**6.0**	1.5	13.0	—	50	6	2
40800-R02-2D	●	**8.0**	0.2	19.0	—	60	8	2
40800-R05-2D	●	**8.0**	0.5	19.0	—	60	8	2
40800-R10-2D	●	**8.0**	1.0	19.0	—	60	8	2
GSX 40800-R15-2D	●	**8.0**	1.5	19.0	—	60	8	2
41000-R02-2D	●	**10.0**	0.2	22.0	—	70	10	2
41000-R05-2D	●	**10.0**	0.5	22.0	—	70	10	2
41000-R10-2D	●	**10.0**	1.0	22.0	—	70	10	2
41000-R15-2D	●	**10.0**	1.5	22.0	—	70	10	2
GSX 41000-R20-2D	●	**10.0**	2.0	22.0	—	70	10	2
41200-R02-2D	●	**12.0**	0.2	26.0	—	75	12	2
41200-R05-2D	●	**12.0**	0.5	26.0	—	75	12	2
41200-R10-2D	●	**12.0**	1.0	26.0	—	75	12	2
41200-R15-2D	●	**12.0**	1.5	26.0	—	75	12	2
GSX 41200-R20-2D	●	**12.0**	2.0	26.0	—	75	12	2

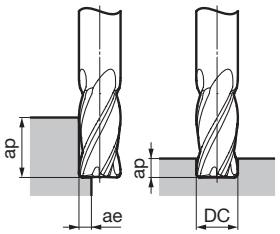
Grade: ACF20

Identification Code

GSX 4 0300 - R 02 - 2D

- GSX — Series Code
- 4 — No. of Flutes
- 0300 — Dia.
- R — Corner Style R: Radius
- 02 — Corner Radius
- 2D — Cutting Edge Length

GSX 40000-R-2D type



Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.
3. For Groove Milling of stainless steel, use 60% of the recommended spindle speed and 40% of the recommended feed rate. (*)

Side Milling

Work Material / Cutting Conditions		Structural Steel, Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel (*) SUS304, SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)
2.0		12,800	570	12,000	380	8,300	230	6,000	150	6,000	130	3,700	70
4.0		6,800	730	6,400	490	4,400	300	3,200	200	3,200	170	2,000	90
6.0		4,600	770	4,300	520	3,000	320	2,200	210	2,200	180	1,400	100
8.0		3,400	770	3,200	520	2,200	320	1,600	210	1,600	180	1,000	100
10.0		2,800	780	2,600	520	1,800	320	1,300	210	1,300	180	800	100
12.0		2,300	780	2,200	530	1,500	320	1,100	210	1,100	180	700	100
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC		1.0DC		1.5DC		1.0DC	
	ae	0.1DC		0.1DC		0.05DC		0.02DC		0.1DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions		Structural Steel, Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel (*) SUS304, SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)		Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)
2.0		12,800	570	12,000	380	8,300	230	6,000	150	6,000	130	3,700	70
4.0		6,800	730	6,400	490	4,400	300	3,200	200	3,200	170	2,000	90
6.0		4,600	770	4,300	520	3,000	320	2,200	210	2,200	180	1,400	100
8.0		3,400	770	3,200	520	2,200	320	1,600	210	1,600	180	1,000	100
10.0		2,800	780	2,600	520	1,800	320	1,300	210	1,300	180	800	100
12.0		2,300	780	2,200	530	1,500	320	1,100	210	1,100	180	700	100
Groove Milling	ap	0.5DC		0.5DC		0.2DC		0.05DC		0.3DC		0.1DC	

Side Milling (Using High Speed Machining Centre)

Work Material / Cutting Conditions		Structural Steel, Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK, HPM (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel (*) SUS304, SUS316	
DC (mm)		Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)	Spindle Speed (min-1)	Feed Rate (mm/min)
2.0		47,800	2,200	47,800	1,600	39,800	1,200	31,800	900	15,900	400
4.0		23,900	2,600	23,900	1,900	19,900	1,400	15,900	1,100	8,000	490
6.0		16,000	2,700	16,000	2,000	13,300	1,500	10,600	1,200	5,300	510
8.0		12,000	2,700	12,000	2,000	10,000	1,500	8,000	1,200	4,000	520
10.0		9,600	2,700	9,600	2,000	8,000	1,500	6,400	1,200	3,200	520
12.0		8,000	2,700	8,000	2,000	6,700	1,500	5,300	1,200	2,700	520
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC		1.0DC		1.5DC	
	ae	0.05DC		0.05DC		0.05DC		0.02DC		0.05DC	

GSV 4000-R-2.5D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Radius r | 40° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping | Profiling

Fig 1

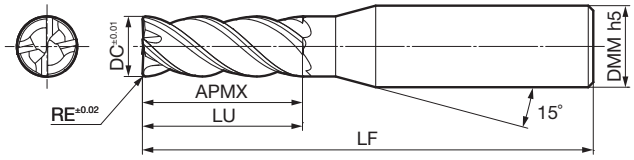
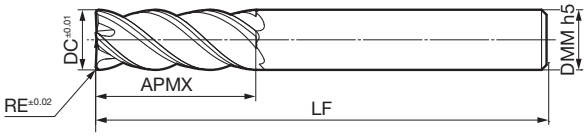


Fig 2



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Corner Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSV 4030-R02-2.5D	●	**3.0**	0.2	8.0	9.5	50	6	1
4030-R05-2.5D	●	**3.0**	0.5	8.0	9.5	50	6	1
4040-R02-2.5D	●	**4.0**	0.2	10.0	11.5	50	6	1
4040-R05-2.5D	●	**4.0**	0.5	10.0	11.5	50	6	1
4040-R10-2.5D	●	**4.0**	1.0	10.0	11.5	50	6	1
GSV 4050-R02-2.5D	●	**5.0**	0.2	13.0	14.5	60	6	1
4050-R05-2.5D	●	**5.0**	0.5	13.0	14.5	60	6	1
4050-R10-2.5D	●	**5.0**	1.0	13.0	14.5	60	6	1
4060-R03-2.5D	●	**6.0**	0.3	15.0	—	60	6	2
4060-R05-2.5D	●	**6.0**	0.5	15.0	—	60	6	2
GSV 4060-R10-2.5D	●	**6.0**	1.0	15.0	—	60	6	2
4060-R15-2.5D	●	**6.0**	1.5	15.0	—	60	6	2
4080-R03-2.5D	●	**8.0**	0.3	20.0	—	80	8	2
4080-R05-2.5D	●	**8.0**	0.5	20.0	—	80	8	2
4080-R10-2.5D	●	**8.0**	1.0	20.0	—	80	8	2
GSV 4080-R15-2.5D	●	**8.0**	1.5	20.0	—	80	8	2
4080-R20-2.5D	●	**8.0**	2.0	20.0	—	80	8	2
4100-R03-2.5D	●	**10.0**	0.3	25.0	—	90	10	2
4100-R05-2.5D	●	**10.0**	0.5	25.0	—	90	10	2
4100-R10-2.5D	●	**10.0**	1.0	25.0	—	90	10	2
GSV 4100-R15-2.5D	●	**10.0**	1.5	25.0	—	90	10	2
4100-R20-2.5D	●	**10.0**	2.0	25.0	—	90	10	2
4120-R05-2.5D	●	**12.0**	0.5	30.0	—	90	12	2
4120-R10-2.5D	●	**12.0**	1.0	30.0	—	90	12	2
4120-R15-2.5D	●	**12.0**	1.5	30.0	—	90	12	2
GSV 4120-R20-2.5D	●	**12.0**	2.0	30.0	—	90	12	2
4120-R30-2.5D	●	**12.0**	3.0	30.0	—	90	12	2
4160-R10-2.5D	●	**16.0**	1.0	40.0	—	115	16	2
4160-R15-2.5D	●	**16.0**	1.5	40.0	—	115	16	2
4160-R20-2.5D	●	**16.0**	2.0	40.0	—	115	16	2
GSV 4160-R30-2.5D	●	**16.0**	3.0	40.0	—	115	16	2
4200-R10-2.5D	●	**20.0**	1.0	50.0	—	125	20	2
4200-R15-2.5D	●	**20.0**	1.5	50.0	—	125	20	2
4200-R20-2.5D	●	**20.0**	2.0	50.0	—	125	20	2
4200-R30-2.5D	●	**20.0**	3.0	50.0	—	125	20	2
GSV 4250-R10-2.5D	●	**25.0**	1.0	63.0	—	140	25	2
4250-R15-2.5D	●	**25.0**	1.5	63.0	—	140	25	2
4250-R20-2.5D	●	**25.0**	2.0	63.0	—	140	25	2
4250-R30-2.5D	●	**25.0**	3.0	63.0	—	140	25	2

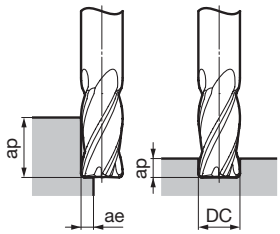
Grade: ACF20

Identification Code

GSV 4 030 - R 02 - 2.5D

- GSV: Series Code
- 4: No. of Flutes
- 030: Dia.
- R: Corner Style R: Radius
- 02: Corner Radius
- 2.5D: Cutting Edge Length

GSV 4000-R-2.5D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		13,000	1,000	10,000	800	8,000	700	10,000	580	5,000	200
4.0		9,600	1,200	8,000	1,000	6,000	800	5,500	650	3,000	230
6.0		6,800	1,500	5,600	1,200	4,200	900	3,800	680	2,100	240
8.0		5,200	1,600	4,400	1,300	3,200	950	2,800	650	1,600	250
10.0		4,200	1,500	3,500	1,200	2,600	800	2,300	600	1,300	210
12.0		3,500	1,400	3,000	1,200	2,200	700	1,900	550	1,100	180
14.0		3,000	1,200	2,600	1,100	1,800	600	1,600	500	900	150
16.0		2,700	1,100	2,200	1,000	1,600	600	1,400	480	760	130
18.0		2,400	1,000	2,000	900	1,400	570	1,300	450	680	120
20.0		2,200	900	1,700	800	1,200	550	1,100	400	600	100
25.0		1,700	680	1,400	630	1,000	450	890	310	480	82
Standard Depth of Cut	ap	1.5DC									
	ae	0.2DC				0.05DC		0.1DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		13,000	750	10,000	550	8,400	500	6,500	300	4,000	140
4.0		8,200	800	6,000	600	5,200	500	4,000	330	2,000	130
6.0		6,100	1,100	4,000	600	3,500	580	2,700	350	1,350	150
8.0		4,600	1,000	3,000	580	2,600	570	2,000	330	1,000	140
10.0		3,600	1,000	2,400	550	2,100	510	1,600	200	800	130
12.0		3,100	920	2,000	500	1,700	450	1,300	280	660	110
14.0		2,600	750	1,700	450	1,500	400	1,100	250	570	100
16.0		2,300	670	1,500	420	1,300	350	1,000	230	500	90
18.0		2,000	620	1,300	380	1,100	330	900	200	430	80
20.0		1,900	600	1,200	360	1,000	320	800	180	380	70
25.0		1,500	470	1,000	300	790	250	640	140	300	55
Standard Depth of Cut	ap	0.8DC				0.16DC		0.4DC		0.16DC	

GSXVL 4000-R-2.5D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | GSX Coat | Radius r | Helix Angle 40° 43° | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping | Profiling

Fig 1

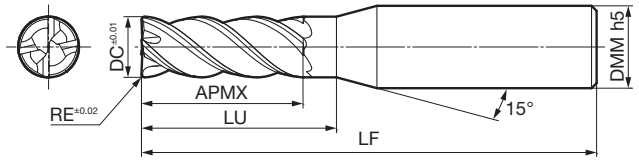
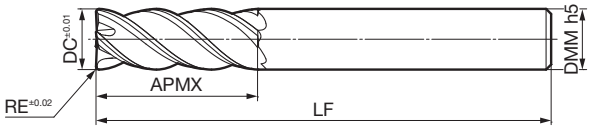


Fig 2



Body

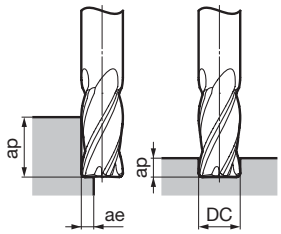
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Corner Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSXVL 4030-R02-2.5D	●	**3.0**	0.2	8.0	9.5	50	6	1
4030-R05-2.5D	●	**3.0**	0.5	8.0	9.5	50	6	1
4040-R02-2.5D	●	**4.0**	0.2	10.0	11.5	50	6	1
4040-R05-2.5D	●	**4.0**	0.5	10.0	11.5	50	6	1
4040-R10-2.5D	●	**4.0**	1.0	10.0	11.5	50	6	1
GSXVL 4050-R02-2.5D	●	**5.0**	0.2	13.0	14.5	60	6	1
4050-R05-2.5D	●	**5.0**	0.5	13.0	14.5	60	6	1
4050-R10-2.5D	●	**5.0**	1.0	13.0	14.5	60	6	1
4060-R03-2.5D	●	**6.0**	0.3	15.0	—	60	6	2
4060-R05-2.5D	●	**6.0**	0.5	15.0	—	60	6	2
GSXVL 4060-R10-2.5D	●	**6.0**	1.0	15.0	—	60	6	2
4060-R15-2.5D	●	**6.0**	1.5	15.0	—	60	6	2
4080-R03-2.5D	●	**8.0**	0.3	20.0	—	80	8	2
4080-R05-2.5D	●	**8.0**	0.5	20.0	—	80	8	2
4080-R10-2.5D	●	**8.0**	1.0	20.0	—	80	8	2
GSXVL 4080-R15-2.5D	●	**8.0**	1.5	20.0	—	80	8	2
4080-R20-2.5D	●	**8.0**	2.0	20.0	—	80	8	2
4100-R03-2.5D	●	**10.0**	0.3	25.0	—	90	10	2
4100-R05-2.5D	●	**10.0**	0.5	25.0	—	90	10	2
4100-R10-2.5D	●	**10.0**	1.0	25.0	—	90	10	2
GSXVL 4100-R15-2.5D	●	**10.0**	1.5	25.0	—	90	10	2
4100-R20-2.5D	●	**10.0**	2.0	25.0	—	90	10	2
4120-R05-2.5D	●	**12.0**	0.5	30.0	—	90	12	2
4120-R10-2.5D	●	**12.0**	1.0	30.0	—	90	12	2
4120-R15-2.5D	●	**12.0**	1.5	30.0	—	90	12	2
GSXVL 4120-R20-2.5D	●	**12.0**	2.0	30.0	—	90	12	2
4120-R30-2.5D	●	**12.0**	3.0	30.0	—	90	12	2
4160-R10-2.5D	●	**16.0**	1.0	40.0	—	115	16	2
4160-R15-2.5D	●	**16.0**	1.5	40.0	—	115	16	2
4160-R20-2.5D	●	**16.0**	2.0	40.0	—	115	16	2
GSXVL 4160-R30-2.5D	●	**16.0**	3.0	40.0	—	115	16	2
4200-R10-2.5D	●	**20.0**	1.0	50.0	—	125	20	2
4200-R15-2.5D	●	**20.0**	1.5	50.0	—	125	20	2
4200-R20-2.5D	●	**20.0**	2.0	50.0	—	125	20	2
4200-R30-2.5D	●	**20.0**	3.0	50.0	—	125	20	2
GSXVL 4250-R10-2.5D		**25.0**	1.0	63.0	—	140	25	2
4250-R15-2.5D		**25.0**	1.5	63.0	—	140	25	2
4250-R20-2.5D		**25.0**	2.0	63.0	—	140	25	2
4250-R30-2.5D		**25.0**	3.0	63.0	—	140	25	2

Grade: ACF20

For the regrinding procedure, please download the details from our website.
https://www.sumitool.com/en/products/cutting-tools/endmills/pdf/gsxvl-regrinding_en.pdf

GSXVL 4000-R-2.5D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		13,000	1,000	10,000	800	8,000	700	10,000	580	5,000	200
4.0		9,600	1,200	8,000	1,000	6,000	800	5,500	650	3,000	230
6.0		6,800	1,500	5,600	1,200	4,200	900	3,800	680	2,100	240
8.0		5,200	1,600	4,400	1,300	3,200	950	2,800	650	1,600	250
10.0		4,200	1,500	3,500	1,200	2,600	800	2,300	600	1,300	210
12.0		3,500	1,400	3,000	1,200	2,200	700	1,900	550	1,100	180
14.0		3,000	1,200	2,600	1,100	1,800	600	1,600	500	900	150
16.0		2,700	1,100	2,200	1,000	1,600	600	1,400	480	760	130
18.0		2,400	1,000	2,000	900	1,400	570	1,300	450	680	120
20.0		2,200	900	1,700	800	1,200	550	1,100	400	600	100
25.0		1,700	680	1,400	630	1,000	450	890	310	480	82
Standard Depth of Cut	ap	1.5DC									
	ae	0.2DC				0.05DC		0.1DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel SUS304,SUS316		Titanium Alloy	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		13,000	750	10,000	550	8,400	500	6,500	300	4,000	140
4.0		8,200	800	6,000	600	5,200	500	4,000	330	2,000	130
6.0		6,100	1,100	4,000	600	3,500	580	2,700	350	1,350	150
8.0		4,600	1,000	3,000	580	2,600	570	2,000	330	1,000	140
10.0		3,600	1,000	2,400	550	2,100	510	1,600	200	800	130
12.0		3,100	920	2,000	500	1,700	450	1,300	280	660	110
14.0		2,600	750	1,700	450	1,500	400	1,100	250	570	100
16.0		2,300	670	1,500	420	1,300	350	1,000	230	500	90
18.0		2,000	620	1,300	380	1,100	330	900	200	430	80
20.0		1,900	600	1,200	360	1,000	320	800	180	380	70
25.0		1,500	470	1,000	300	790	250	640	140	300	55
Standard Depth of Cut	ap	1.0DC				0.2DC		0.5DC		0.2DC	

SSEHVL 4000W-R type

Stainless Steel | Ti Alloy / Heat Resistant Alloy

4 Flutes | GS HARD Coat | Radius r | Helix Angle 42° 45° | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Profiling

Fig 1

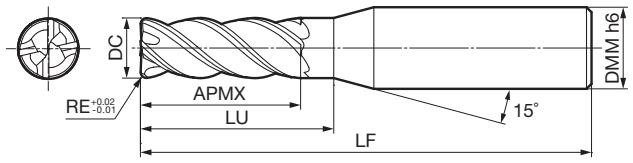
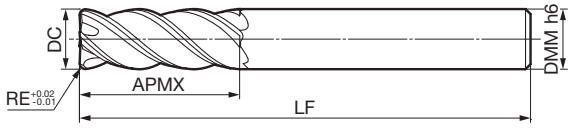


Fig 2



DC	Tolerance
4.0 < D ≤ 6.0	-0.020 to -0.038
6.0 < D	-0.025 to -0.047

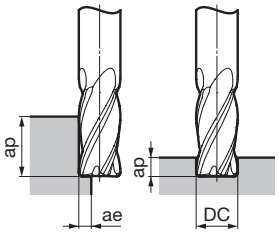
Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSEHVL 4045W-R05	●	**4.5**	0.5	12.0	14.5	50	6	1
4045W-R10	●	**4.5**	1.0	12.0	14.5	50	6	1
4050W-R05	●	**5.0**	0.5	13.0	15.5	60	6	1
4050W-R10	●	**5.0**	1.0	13.0	15.5	60	6	1
4060W-R10	●	**6.0**	1.0	13.0	—	60	6	2
SSEHVL 4080W-R10	●	**8.0**	1.0	19.0	—	80	8	2
4100W-R10	●	**10.0**	1.0	22.0	—	90	10	2
4100W-R30	●	**10.0**	3.0	22.0	—	90	10	2
4120W-R10	●	**12.0**	1.0	26.0	—	90	12	2
4120W-R30	●	**12.0**	3.0	26.0	—	90	12	2
SSEHVL 4160W-R10	●	**16.0**	1.0	32.0	—	115	16	2
4160W-R30	●	**16.0**	3.0	32.0	—	115	16	2
4200W-R10	●	**20.0**	1.0	40.0	—	125	20	2
4200W-R30	●	**20.0**	3.0	40.0	—	125	20	2
4250W-R10	●	**25.0**	1.0	50.0	—	140	25	2
SSEHVL 4250W-R30	●	**25.0**	3.0	50.0	—	140	25	2

Grade: ACW52

SSEHVL 4000W-R type



Recommended Cutting Conditions

1. For stable machining, a high-rigidity machine is recommended.
2. Wet machining is recommended for stainless steel and heat-resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.

Side Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.5		5,100	480	5,300	600	2,500	200
5.0		4,600	520	4,800	700	2,200	220
6.0		3,800	560	4,000	800	1,800	210
8.0		2,900	520	3,000	780	1,400	200
10.0		2,300	500	2,400	640	1,100	180
12.0		1,900	470	2,000	600	930	160
16.0		1,400	430	1,500	500	700	140
20.0		1,100	330	1,200	260	560	110
25.0		890	270	950	290	450	90
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC	
	ae	0.1DC		0.05DC		0.05DC	

Groove Milling

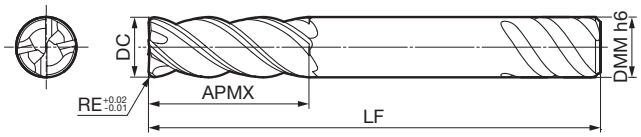
Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.5		4,200	200	3,900	270	1,400	100
5.0		3,800	240	3,500	300	1,300	120
6.0		3,200	260	2,900	300	1,100	140
8.0		2,400	240	2,200	270	800	120
10.0		1,900	220	1,700	250	650	110
12.0		1,600	200	1,400	230	550	100
16.0		1,200	130	1,100	200	400	80
20.0		950	95	890	90	320	60
25.0		760	75	700	70	250	50
Standard Depth of Cut	ap	0.3DC		0.2DC		0.15DC	

SSEHVL 4000WS-R type

Stainless Steel | Ti Alloy / Heat Resistant Alloy

4 Flutes | GS HARD Coat | Radius | 42° 45° Helix Angle | SAFE-LOCK Applicable Products | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Profiling

Fig 1



DC	Tolerance
4.0 < D ≤ 6.0	-0.020 to -0.038
6.0 < D	-0.025 to -0.047

Body (SAFE-LOCK™ Product)

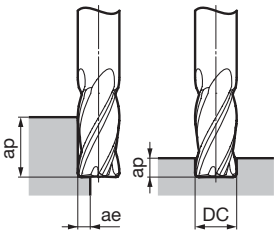
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
SSEHVL 4120WS-R10	▲	**12.0**	1.0	26.0	90	12	1
4120WS-R30	▲	**12.0**	3.0	26.0	90	12	1
4160WS-R10	▲	**16.0**	1.0	32.0	115	16	1
4160WS-R30	▲	**16.0**	3.0	32.0	115	16	1
4200WS-R10	▲	**20.0**	1.0	40.0	125	20	1
SSEHVL 4200WS-R30	▲	**20.0**	3.0	40.0	125	20	1
4250WS-R10	▲	**25.0**	1.0	50.0	140	25	1
4250WS-R30	▲	**25.0**	3.0	50.0	140	25	1

Grade: ACW52

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SSEHVL 4000WS-R type



Recommended Cutting Conditions

1. For stable machining, a high-rigidity machine is recommended.
2. Wet machining is recommended for stainless steel and heat-resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.

Side Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
12.0		1,900	470	2,000	600	930	160
16.0		1,400	430	1,500	500	700	140
20.0		1,100	330	1,200	260	560	110
25.0		890	270	950	290	450	90
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC	
	ae	0.1DC		0.05DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
12.0		1,600	200	1,400	230	550	100
16.0		1,200	130	1,100	200	400	80
20.0		950	95	890	90	320	60
25.0		760	75	700	70	250	50
Standard Depth of Cut	ap	0.3DC		0.2DC		0.15DC	

SSEH 4000W-R type

Stainless Steel | Ti Alloy / Heat Resistant Alloy

4 Flutes | GS HARD Coat | Radius r | 45° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling | Profiling

Fig 1

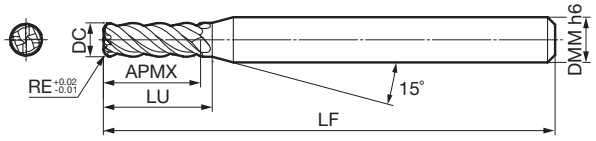
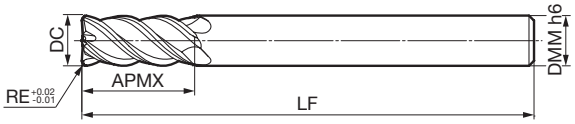


Fig 2



DC	Tolerance
4.0 < D ≤ 6.0	-0.020 to -0.038
6.0 < D	-0.025 to -0.047

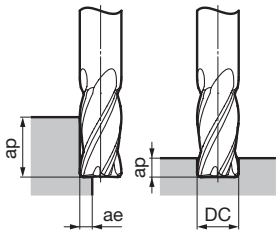
Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSEH 4045W-R05	●	**4.5**	0.5	12.0	14.5	50	6	1
4050W-R05	●	**5.0**	0.5	13.0	15.5	60	6	1
4060W-R10	●	**6.0**	1.0	13.0	—	60	6	2
4080W-R10	●	**8.0**	1.0	19.0	—	80	8	2
4100W-R10	●	**10.0**	1.0	22.0	—	90	10	2
SSEH 4100W-R30	●	**10.0**	3.0	22.0	—	90	10	2
4120W-R10	●	**12.0**	1.0	26.0	—	90	12	2
4120W-R30	●	**12.0**	3.0	26.0	—	90	12	2
4160W-R10	●	**16.0**	1.0	32.0	—	115	16	2
4160W-R30	●	**16.0**	3.0	32.0	—	115	16	2
SSEH 4200W-R10	●	**20.0**	1.0	40.0	—	125	20	2
4200W-R30	●	**20.0**	3.0	40.0	—	125	20	2
4250W-R10	●	**25.0**	1.0	50.0	—	140	25	2
4250W-R30	●	**25.0**	3.0	50.0	—	140	25	2

Grade: ACW52

SSEH 4000W-R type



Recommended Cutting Conditions

1. For stable machining, a high-rigidity machine is recommended.
2. Wet machining is recommended for stainless steel and heat-resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.

Side Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.5		3,500	350	3,500	280	2,100	170
5.0		3,200	380	3,200	320	1,900	190
6.0		2,700	430	2,700	320	1,600	190
8.0		2,000	400	2,000	280	1,200	170
10.0		1,600	380	1,600	260	1,000	160
12.0		1,300	360	1,300	230	800	140
16.0		1,000	320	1,000	200	600	120
20.0		800	260	800	160	480	100
25.0		640	200	640	130	380	80
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC	
	ae	0.1DC		0.05DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.5		2,800	140	2,500	200	1,300	100
5.0		2,500	150	2,200	220	1,100	110
6.0		2,100	170	1,900	230	1,000	120
8.0		1,600	160	1,400	200	700	100
10.0		1,300	160	1,100	180	600	100
12.0		1,100	150	900	160	500	90
16.0		800	130	700	140	400	80
20.0		640	100	560	110	320	65
25.0		510	85	450	90	250	50
Standard Depth of Cut	ap	0.3DC		0.2DC		0.15DC	

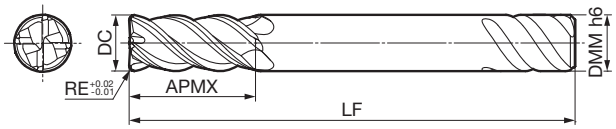
Radius Endmill for Exotic Alloys

SSEH 4000WS-R type

Stainless Steel | Ti Alloy / Heat Resistant Alloy

4 Flutes | GS HARD Coat | Radius r | 45° Helix Angle | SAFE-LOCK Applicable Products | Shoulder Milling | Groove Finishing | Face Milling | Profiling

Fig 1



DC	Tolerance
4.0 < D ≤ 6.0	-0.020 to -0.038
6.0 < D	-0.025 to -0.047

Body (SAFE-LOCK™ Product)

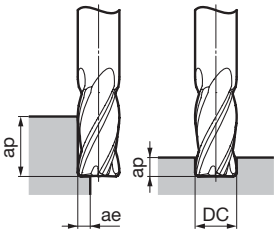
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
SSEH 4120WS-R10	▲	**12.0**	1.0	26.0	90	12	1
4120WS-R30	▲	**12.0**	3.0	26.0	90	12	1
4160WS-R10	▲	**16.0**	1.0	32.0	115	16	1
4160WS-R30	▲	**16.0**	3.0	32.0	115	16	1
4200WS-R10	▲	**20.0**	1.0	40.0	125	20	1
SSEH 4200WS-R30	▲	**20.0**	3.0	40.0	125	20	1
4250WS-R10	▲	**25.0**	1.0	50.0	140	25	1
4250WS-R30	▲	**25.0**	3.0	50.0	140	25	1

Grade: ACW52

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SSEH 4000WS-R type



Recommended Cutting Conditions

1. For stable machining, a high-rigidity machine is recommended.
2. Wet machining is recommended for stainless steel and heat-resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.

Side Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
12.0		1,300	360	1,300	230	800	140
16.0		1,000	320	1,000	200	600	120
20.0		800	260	800	160	480	100
25.0		640	200	640	130	380	80
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC	
	ae	0.1DC		0.05DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
12.0		1,100	150	900	160	500	90
16.0		800	130	700	140	400	80
20.0		640	100	560	110	320	65
25.0		510	85	450	90	250	50
Standard Depth of Cut	ap	0.3DC		0.2DC		0.15DC	

SSUP 4000ZX-R type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

4 Flutes | ZX Coat | Radius r | 40° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Helical Milling | Ramping | Profiling

Fig 1

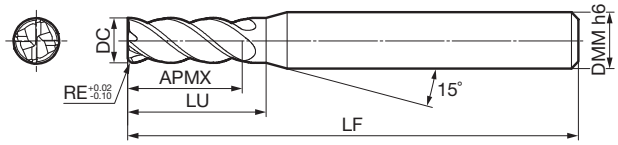
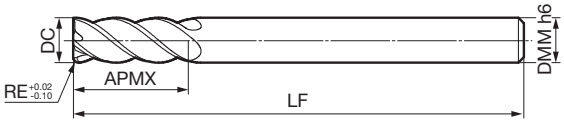


Fig 2



DC	Tolerance
D ≤ 3.0	-0.014 -0.028
3.0 < D ≤ 6.0	-0.020 -0.038
6.0 < D	-0.025 -0.047

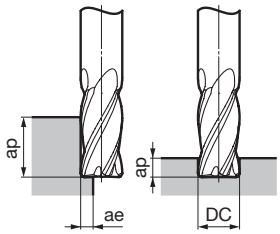
Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSUP 4030ZX-R02	●	**3.0**	0.2	8.0	9.5	50	6	1
4030ZX-R05	●	**3.0**	0.5	8.0	9.5	50	6	1
4040ZX-R02	●	**4.0**	0.2	11.0	12.5	50	6	1
4040ZX-R05	●	**4.0**	0.5	11.0	12.5	50	6	1
4040ZX-R10	●	**4.0**	1.0	11.0	12.5	50	6	1
SSUP 4050ZX-R02	●	**5.0**	0.2	13.0	14.5	60	6	1
4050ZX-R05	●	**5.0**	0.5	13.0	14.5	60	6	1
4050ZX-R10	●	**5.0**	1.0	13.0	14.5	60	6	1
4060ZX-R03	●	**6.0**	0.3	13.0	—	60	6	2
4060ZX-R05	●	**6.0**	0.5	13.0	—	60	6	2
SSUP 4060ZX-R10	●	**6.0**	1.0	13.0	—	60	6	2
4060ZX-R15	●	**6.0**	1.5	13.0	—	60	6	2
4080ZX-R03	●	**8.0**	0.3	19.0	—	80	8	2
4080ZX-R05	●	**8.0**	0.5	19.0	—	80	8	2
4080ZX-R10	●	**8.0**	1.0	19.0	—	80	8	2
SSUP 4080ZX-R15	●	**8.0**	1.5	19.0	—	80	8	2
4080ZX-R20	●	**8.0**	2.0	19.0	—	80	8	2
4100ZX-R03	●	**10.0**	0.3	22.0	—	90	10	2
4100ZX-R05	●	**10.0**	0.5	22.0	—	90	10	2
4100ZX-R10	●	**10.0**	1.0	22.0	—	90	10	2
SSUP 4100ZX-R15	●	**10.0**	1.5	22.0	—	90	10	2
4100ZX-R20	●	**10.0**	2.0	22.0	—	90	10	2
4120ZX-R05	●	**12.0**	0.5	26.0	—	90	12	2
4120ZX-R10	●	**12.0**	1.0	26.0	—	90	12	2
4120ZX-R15	●	**12.0**	1.5	26.0	—	90	12	2
SSUP 4120ZX-R20	●	**12.0**	2.0	26.0	—	90	12	2
4120ZX-R30	●	**12.0**	3.0	26.0	—	90	12	2
4160ZX-R10	●	**16.0**	1.0	32.0	—	115	16	2
4160ZX-R15	●	**16.0**	1.5	32.0	—	115	16	2
4160ZX-R20	●	**16.0**	2.0	32.0	—	115	16	2
SSUP 4160ZX-R30	●	**16.0**	3.0	32.0	—	115	16	2
4200ZX-R10	●	**20.0**	1.0	38.0	—	125	20	2
4200ZX-R15	●	**20.0**	1.5	38.0	—	125	20	2
4200ZX-R20	●	**20.0**	2.0	38.0	—	125	20	2
4200ZX-R30	●	**20.0**	3.0	38.0	—	125	20	2

Grade: ACZ50M

SSUP 4000ZX-R type



Recommended Cutting Conditions

1. For groove Milling of stainless steel, use 60% of the recommended spindle speed and 40% of the recommended feed rate. (*)
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Side Milling and Groove Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron SS, SC, FC (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel (*)		Heat-Resistant Alloy Titanium Alloy (20 to 45HRC)	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		9,000	720	6,000	430	4,000	320	5,500	320	2,600	120
4.0		6,600	800	4,500	450	3,000	380	4,000	320	2,000	120
6.0		4,800	960	3,000	480	2,500	380	3,000	480	1,200	120
8.0		3,600	1,000	2,200	610	2,000	400	2,000	520	1,000	140
10.0		2,800	1,000	1,800	610	1,500	400	1,700	550	800	160
12.0		2,400	950	1,500	550	1,200	380	1,500	500	700	140
14.0		2,200	880	1,300	490	1,000	360	1,200	430	600	130
16.0		1,800	650	1,100	420	800	300	1,000	360	500	120
18.0		1,600	580	1,000	360	750	270	900	340	450	110
20.0		1,400	500	900	330	700	250	820	300	400	100
Side Milling	ap	1.5DC									
	ae	0.1DC				0.05DC		0.1DC		0.05DC	
Groove Milling	ap	1.0DC				0.2DC		0.3DC		0.2DC	

SSUPR 4000ZX-R type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Stainless Steel | Cast Iron

4 Flutes | ZX Coat | Radius r | 45° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling | Profiling

Fig 1

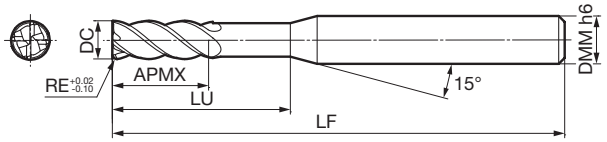


Fig 2

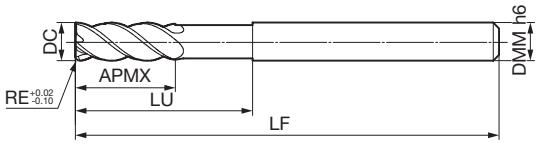
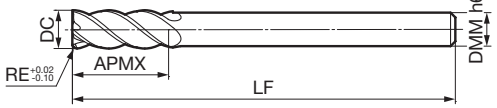


Fig 3



DC	Tolerance
D ≤ 3.0	-0.014 -0.028
3.0 < D ≤ 6.0	-0.020 -0.038
6.0 < D	-0.025 -0.047

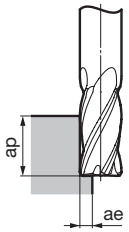
Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSUPR 4030ZX-R02	●	**3.0**	0.2	4.5	12.0	60	6	1
4030ZX-R05	●	**3.0**	0.5	4.5	12.0	60	6	1
4040ZX-R02	●	**4.0**	0.2	6.0	16.0	60	6	1
4040ZX-R05	●	**4.0**	0.5	6.0	16.0	60	6	1
4050ZX-R02	●	**5.0**	0.2	7.5	20.0	60	6	1
SSUPR 4050ZX-R05	●	**5.0**	0.5	7.5	20.0	60	6	1
4060ZX-R03	●	**6.0**	0.3	9.0	24.0	60	6	2
4060ZX-R05	●	**6.0**	0.5	9.0	24.0	60	6	2
4070ZX-R03	●	**7.0**	0.3	10.5	—	80	6	3
4070ZX-R05	●	**7.0**	0.5	10.5	—	80	6	3
SSUPR 4080ZX-R05	●	**8.0**	0.5	12.0	34.0	80	8	2
4080ZX-R10	●	**8.0**	1.0	12.0	34.0	80	8	2
4090ZX-R05	●	**9.0**	0.5	13.5	—	90	8	3
4090ZX-R10	●	**9.0**	1.0	13.5	—	90	8	3
4100ZX-R05	●	**10.0**	0.5	15.0	42.0	100	10	2
SSUPR 4100ZX-R10	●	**10.0**	1.0	15.0	42.0	100	10	2
4100ZX-R15	●	**10.0**	1.5	15.0	42.0	100	10	2
4110ZX-R05	●	**11.0**	0.5	16.5	—	120	10	3
4110ZX-R10	●	**11.0**	1.0	16.5	—	120	10	3
4110ZX-R15	●	**11.0**	1.5	16.5	—	120	10	3
SSUPR 4120ZX-R05	●	**12.0**	0.5	18.0	50.0	120	12	2
4120ZX-R10	●	**12.0**	1.0	18.0	50.0	120	12	2
4120ZX-R15	●	**12.0**	1.5	18.0	50.0	120	12	2
4130ZX-R05	●	**13.0**	0.5	19.5	—	130	12	3
4130ZX-R10	●	**13.0**	1.0	19.5	—	130	12	3
SSUPR 4130ZX-R15	●	**13.0**	1.5	19.5	—	130	12	3
4160ZX-R10	●	**16.0**	1.0	24.0	66.0	160	16	2
4160ZX-R15	●	**16.0**	1.5	24.0	66.0	160	16	2
4160ZX-R20	●	**16.0**	2.0	24.0	66.0	160	16	2
4170ZX-R10	●	**17.0**	1.0	25.5	—	170	16	3
SSUPR 4170ZX-R15	●	**17.0**	1.5	25.5	—	170	16	3
4170ZX-R20	●	**17.0**	2.0	25.5	—	170	16	3
4200ZX-R10	●	**20.0**	1.0	30.0	82.0	200	20	2
4200ZX-R15	●	**20.0**	1.5	30.0	82.0	200	20	2
4200ZX-R20	●	**20.0**	2.0	30.0	82.0	200	20	2

Grade: ACZ50M

SSUPR 4000ZX-R type



Recommended Cutting Conditions

1. The conditions recommended are for endmills with standard overhang lengths of 4xD.
   For overhangs of 5xD or more, please use 70% (max) of recommended conditions.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Side Milling

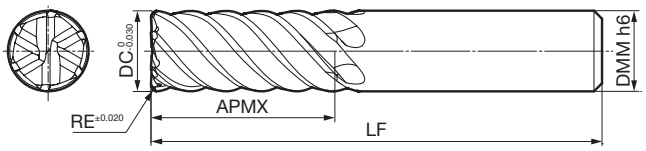
Work Material / Cutting Conditions		Carbon Steel, Cast Iron (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel		Heat-Resistant Alloy Titanium Alloy (20 to 45HRC)	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
3.0		9,000	600	5,300	400	3,100	200	4,200	350	2,600	160
4.0		6,600	600	4,000	400	2,400	200	3,200	350	2,000	160
6.0		4,200	600	2,600	400	1,600	200	2,100	350	1,300	160
8.0		3,200	650	2,000	450	1,200	200	1,600	350	1,000	160
10.0		2,500	650	1,600	450	950	200	1,200	400	800	180
12.0		2,100	650	1,300	450	800	200	1,000	400	650	180
13.0		1,900	650	1,200	450	700	200	950	400	600	180
16.0		1,600	650	1,000	400	600	200	800	350	500	160
17.0		1,500	600	900	400	550	200	750	350	450	160
20.0		1,200	600	800	400	500	200	650	350	400	160
Standard Depth of Cut	ap	1.2DC									
	ae	0.1DC				0.05DC		0.1DC		0.05DC	

GSH 6000SF-R type

Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Hardened Steel 60 to 65HRC

6 Flutes | GS HARD Coat | Radius r | 50° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling | Profiling

Fig 1



Body

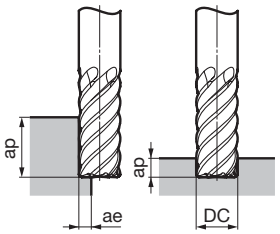
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
GSH 6060SF-R02	●	**6.0**	0.2	13.0	50	6	1
6060SF-R05	●	**6.0**	0.5	13.0	50	6	1
6060SF-R10	●	**6.0**	1.0	13.0	50	6	1
6080SF-R02	●	**8.0**	0.2	19.0	60	8	1
6080SF-R05	●	**8.0**	0.5	19.0	60	8	1
GSH 6080SF-R10	●	**8.0**	1.0	19.0	60	8	1
6100SF-R05	●	**10.0**	0.5	22.0	70	10	1
6100SF-R10	●	**10.0**	1.0	22.0	70	10	1
6100SF-R15	●	**10.0**	1.5	22.0	70	10	1
6100SF-R20	●	**10.0**	2.0	22.0	70	10	1
GSH 6120SF-R05	●	**12.0**	0.5	26.0	75	12	1
6120SF-R10	●	**12.0**	1.0	26.0	75	12	1
6120SF-R15	●	**12.0**	1.5	26.0	75	12	1
6120SF-R20	●	**12.0**	2.0	26.0	75	12	1

Grade: ACF07C

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling and Groove Milling

Work Material / Cutting Conditions / DC (mm)		Low Carbon Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)		Hardened Steel SKH55 (65 to 70HRC)	
		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
6.0		7,500	2,700	6,700	1,930	5,200	1,300	4,100	810	3,700	670	2,600	470
8.0		5,600	2,700	5,000	1,930	3,900	1,300	3,050	810	2,800	670	1,950	470
10.0		4,500	2,700	4,000	1,930	3,100	1,300	2,450	810	2,200	670	1,550	470
12.0		3,750	2,700	3,350	1,930	2,600	1,300	2,050	810	1,850	670	1,300	470
Side Milling	ap	1 to 1.5DC											
	ae	0.1DC				0.05DC				0.02DC			
Groove Milling	ap	0.1DC				0.05DC				Up to 0.05DC Max. 0.5mm			

Side Milling (Using High Speed Machining Centre)

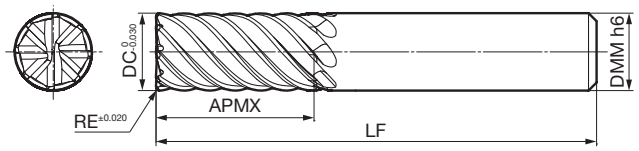
Work Material / Cutting Conditions / DC (mm)		Low Carbon Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)	
		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
6.0		16,000	5,800	16,000	5,800	16,000	5,800	12,000	3,200	8,000	2,000
8.0		12,000	5,800	12,000	5,800	12,000	5,800	9,000	3,200	6,000	2,000
10.0		9,600	5,800	9,600	5,800	9,600	5,800	7,200	3,200	4,800	2,000
12.0		8,000	5,800	8,000	5,800	8,000	5,800	6,000	3,200	4,000	2,000
Standard Depth of Cut	ap	1 to 1.5DC									
	ae	0.1DC		0.05DC		0.05DC		0.02DC		0.01DC	

GSH 8000SF-R type

Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Hardened Steel 60 to 65HRC

8 Flutes | GS HARD Coat | Radius r | 50° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling | Profiling

Fig 1



Body

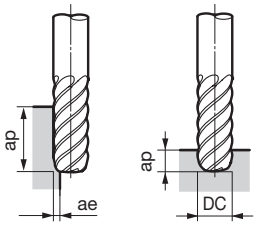
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Overall Length LF	Shank Dia. DMM	Fig
GSH 8160SF-R10	●	**16.0**	1.0	32.0	90	16	1
8160SF-R15	●	**16.0**	1.5	32.0	90	16	1
8160SF-R20	●	**16.0**	2.0	32.0	90	16	1
8200SF-R10	●	**20.0**	1.0	38.0	100	20	1
8200SF-R15	●	**20.0**	1.5	38.0	100	20	1
GSH 8200SF-R20	●	**20.0**	2.0	38.0	100	20	1

Grade: ACF07C

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Side Milling and Groove Milling

Work Material / Cutting Conditions		Low Carbon Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)		Hardened Steel SKH55 (65 to 70HRC)	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
16.0		2,800	2,500	2,500	1,800	1,950	1,220	1,530	760	1,400	630	980	440
20.0		2,250	2,100	2,000	1,540	1,550	1,050	1,230	650	1,100	540	780	380
Side Milling	ap	1 to 1.5DC											
	ae	0.1DC				0.05DC				0.02DC			
Groove Milling	ap	0.1DC				0.05DC				Up to 0.05DC Max. 0.5mm			

Side Milling (Using High Speed Machining Centre)

Work Material / Cutting Conditions		Low Carbon Steel Carbon Steel, Alloy Steel (Up to 35HRC)		Medium Hardened Steel Pre-hardened Steel, Die Steel (35 to 45HRC)		Hardened Steel SKD61 (45 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH51 (60 to 65HRC)	
DC (mm)		Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)
16.0		6,000	5,400	6,000	5,400	6,000	5,400	4,500	3,000	3,000	1,900
20.0		4,800	4,600	4,800	4,600	4,800	4,600	3,600	2,580	2,400	1,600
Standard Depth of Cut	ap	1 to 1.5DC									
	ae	0.1DC		0.05DC		0.05DC		0.02DC		0.01DC	

SSEHVL 4000-R type

Stainless Steel | Ti Alloy / Heat Resistant Alloy

4 Flutes | Uncoated Carbide | Radius | Helix Angle 42° 45° | Shoulder Milling | Groove Finishing | Face Milling | Profiling

Fig 1

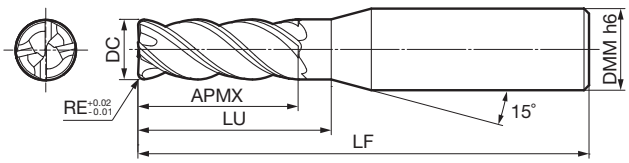
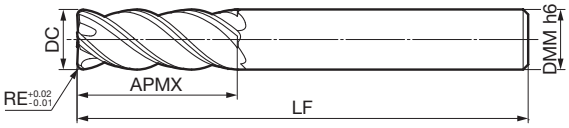


Fig 2



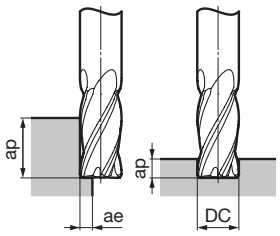
DC	Tolerance
D ≤ 6.0	-0.028 to -0.043
6.0 < D	-0.033 to -0.052

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSEHVL 4045-R05	●	**4.5**	0.5	12.0	14.5	50	6	1
4045-R10	●	**4.5**	1.0	12.0	14.5	50	6	1
4050-R05	●	**5.0**	0.5	13.0	15.5	60	6	1
4050-R10	●	**5.0**	1.0	13.0	15.5	60	6	1
4060-R10	●	**6.0**	1.0	13.0	—	60	6	2
SSEHVL 4080-R10	●	**8.0**	1.0	19.0	—	80	8	2
4100-R10	●	**10.0**	1.0	22.0	—	90	10	2
4100-R30	●	**10.0**	3.0	22.0	—	90	10	2
4120-R10	●	**12.0**	1.0	26.0	—	90	12	2
4120-R30	●	**12.0**	3.0	26.0	—	90	12	2
SSEHVL 4160-R10	●	**16.0**	1.0	32.0	—	115	16	2
4160-R30	●	**16.0**	3.0	32.0	—	115	16	2

Grade: EH520



Recommended Cutting Conditions

1. For stable machining, a high-rigidity machine is recommended.
2. Wet machining is recommended for stainless steel and heat-resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.

Side Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.5		2,300	120	4,600	370	1,600	130
5.0		2,000	130	4,100	410	1,500	150
6.0		1,700	130	3,400	400	1,200	140
8.0		1,300	130	2,600	360	900	130
10.0		1,000	130	2,100	340	700	110
12.0		800	110	1,700	300	600	100
16.0		600	90	1,300	260	500	100
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC	
	pf	0.1DC		0.05DC		0.05DC	

Groove Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.5		1,800	50	3,200	250	1,300	110
5.0		1,600	50	2,900	290	1,200	120
6.0		1,400	50	2,400	290	1,000	120
8.0		1,000	50	1,800	250	700	90
10.0		800	50	1,400	230	600	100
12.0		600	50	1,200	210	500	90
16.0		500	40	900	180	400	80
Standard Depth of Cut	ap	0.3DC		0.2DC		0.15DC	

SSEH 4000-R type

Stainless Steel | Ti Alloy / Heat Resistant Alloy

4 Flutes | Uncoated Carbide | Radius | 45° Helix Angle | Shoulder Milling | Groove Finishing | Face Milling | Profiling

Fig 1

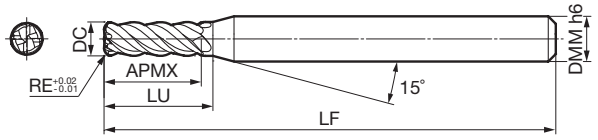
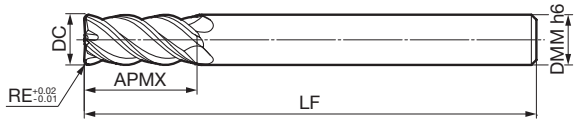


Fig 2



DC	Tolerance
D ≤ 6.0	-0.028 to -0.043
6.0 < D	-0.033 to -0.052

Body

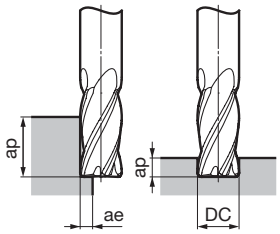
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSEH 4045-R05	●	**4.5**	0.5	12.0	14.5	50	6	1
4050-R05	●	**5.0**	0.5	13.0	15.5	60	6	1
4060-R10	●	**6.0**	1.0	13.0	—	60	6	2
4080-R10	●	**8.0**	1.0	19.0	—	80	8	2
4100-R10	●	**10.0**	1.0	22.0	—	90	10	2
SSEH 4100-R30	●	**10.0**	3.0	22.0	—	90	10	2
4120-R10	●	**12.0**	1.0	26.0	—	90	12	2
4120-R30	●	**12.0**	3.0	26.0	—	90	12	2
4160-R10	●	**16.0**	1.0	32.0	—	115	16	2
4160-R30	●	**16.0**	3.0	32.0	—	115	16	2

Grade: EH520

Recommended Cutting Conditions

1. For stable machining, a high-rigidity machine is recommended.
2. Wet machining is recommended for stainless steel and heat-resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.



Side Milling

Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.5		1,800	90	3,500	280	1,400	110
5.0		1,600	100	3,200	320	1,300	130
6.0		1,300	100	2,700	320	1,100	130
8.0		1,000	100	2,000	280	800	110
10.0		800	100	1,600	260	600	100
12.0		700	100	1,300	230	500	90
16.0		500	80	1,000	200	400	80
Standard Depth of Cut	ap	1.5DC		1.5DC		1.5DC	
	ae	0.1DC		0.05DC		0.05DC	

Groove Milling

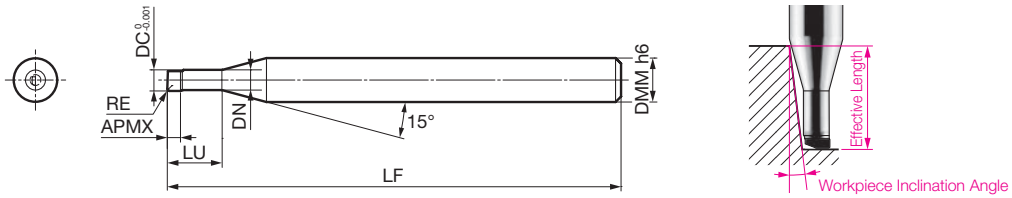
Work Material / Cutting Conditions / DC (mm)		Stainless Steel SUS304,SUS316		Titanium Alloy		Heat-Resistant Alloy	
		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.5		1,400	40	2,500	200	1,100	90
5.0		1,300	40	2,200	220	1,000	100
6.0		1,100	40	1,900	230	800	100
8.0		800	40	1,400	200	600	80
10.0		600	40	1,100	180	500	80
12.0		500	40	900	160	400	70
16.0		400	30	700	140	300	60
Standard Depth of Cut	ap	0.3DC		0.2DC		0.15DC	

NPDRS type

Cemented Carbide | Hard Brittle Material

1 Flute | Binderless PCD | Radius r | Shoulder Milling | Face Milling | Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Corner Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Effective Length for Workpiece Inclination Angle 0.5°	1°	1.5°	2°	3°	Wiper Edge	Fig
NPDRS 1020R002-006	●	0.2	0.02	0.1	0.6	40	0.175	4	0.63	0.65	0.67	0.70	0.75	No	1
1020R005-006	●	0.2	0.05	0.1	0.6	40	0.175	4	0.63	0.65	0.67	0.69	0.74	No	1
1030R002-010	●	0.3	0.02	0.15	1.0	40	0.27	4	1.04	1.08	1.11	1.15	1.24	No	1
1030R005-010	●	0.3	0.05	0.15	1.0	40	0.27	4	1.04	1.08	1.11	1.15	1.23	No	1
1050R005-015	●	0.5	0.05	0.25	1.5	40	0.47	4	1.56	1.61	1.66	1.72	1.84	No	1
NPDRS 1050R010-015	●	0.5	0.10	0.25	1.5	40	0.47	4	1.56	1.60	1.65	1.71	1.83	No	1
1100R005-030	●	1.0	0.05	0.55	3.0	40	0.95	4	3.14	3.24	3.35	3.46	3.72	No	1
1100R010-030	●	1.0	0.10	0.55	3.0	40	0.95	4	3.14	3.24	3.34	3.46	3.71	No	1
1100R020-030	●	1.0	0.20	0.55	3.0	40	0.95	4	3.14	3.23	3.33	3.44	3.69	No	1
1200R005-040	●	2.0	0.05	0.55	4.0	40	1.95	4	4.17	4.31	4.45	4.60	4.94	No	1
NPDRS 1200R010-040	●	2.0	0.10	0.55	4.0	40	1.95	4	4.17	4.30	4.44	4.60	4.93	No	1
1200R020-040	●	2.0	0.20	0.55	4.0	40	1.95	4	4.17	4.30	4.43	4.58	4.91	No	1

Grade: NPD10

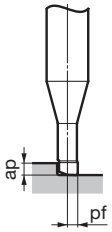
Identification Code

NPDR S 1 020 R002 - 006

Series Code	For Standard Finishing	No. of Flutes	Dia.	Corner Radius	Neck Length

Recommended Cutting Conditions

1. Use a machine with high accuracy for stable cutting.
2. Non-water soluble coolant recommended. Supply as a mist or external coolant. Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine specs and other conditions may vary.
5. The cutting parameters shown are for reference only. Adjust the cutting conditions to the desired machined surface finish.



Work Material		Cemented Carbide			
DC (mm)	LU (mm)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	ap(mm)	pf(mm)
0.2	0.6	40,000	100	0.001	0.001
0.3	1.0	40,000	150	0.002	0.001
0.5	1.5	40,000	200	0.003	0.001
1.0	3.0	40,000	400	0.005	0.003
2.0	4.0	40,000	600	0.010	0.005

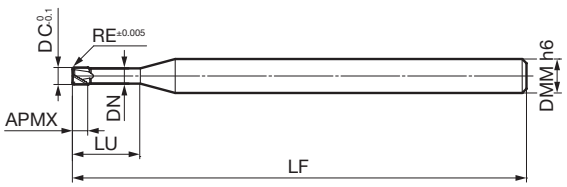
MEMO

BNBR type

Pre-hardened Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Hardened Steel 60 to 65HRC

2 Flutes | CBN | Radius r | Shoulder Milling | Face Milling | Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Corner Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Wiper Edge	Fig
BNBR 2D020R005-0054	●	**0.2**	0.05	0.1	0.5	50	0.17	4	No	1
2D030R005-0054	●	**0.3**	0.05	0.15	0.5	50	0.27	4	No	1
2D040R005-0054	●	**0.4**	0.05	0.2	0.5	50	0.37	4	No	1
2D050R005-0054	●	**0.5**	0.05	0.3	0.5	50	0.47	4	No	1
2D050R005-0154	●	**0.5**	0.05	0.3	1.5	50	0.47	4	No	1
BNBR 2D050R005-0254	●	**0.5**	0.05	0.3	2.5	50	0.47	4	No	1
2D050R010-0154	●	**0.5**	0.10	0.3	1.5	50	0.47	4	No	1
2D050R010-0254	●	**0.5**	0.10	0.3	2.5	50	0.47	4	No	1
2D100R005-0304	●	**1.0**	0.05	0.7	3.0	50	0.97	4	Yes	1
2D100R005-0504	●	**1.0**	0.05	0.7	5.0	50	0.97	4	Yes	1
BNBR 2D100R010-0304	●	**1.0**	0.10	0.7	3.0	50	0.97	4	Yes	1
2D100R010-0504	●	**1.0**	0.10	0.7	5.0	50	0.97	4	Yes	1
2D100R020-0304	●	**1.0**	0.20	0.7	3.0	50	0.97	4	Yes	1
2D100R020-0504	●	**1.0**	0.20	0.7	5.0	50	0.97	4	Yes	1
2D100R030-0304	●	**1.0**	0.30	0.7	3.0	50	0.97	4	Yes	1
BNBR 2D100R030-0504	●	**1.0**	0.30	0.7	5.0	50	0.97	4	Yes	1
2D150R010-0454	●	**1.5**	0.10	1.2	4.5	50	1.47	4	Yes	1
2D150R010-0754	●	**1.5**	0.10	1.2	7.5	50	1.47	4	Yes	1
2D150R020-0454	●	**1.5**	0.20	1.2	4.5	50	1.47	4	Yes	1
2D150R020-0754	●	**1.5**	0.20	1.2	7.5	50	1.47	4	Yes	1
BNBR 2D150R030-0454	●	**1.5**	0.30	1.2	4.5	50	1.47	4	Yes	1
2D150R030-0754	●	**1.5**	0.30	1.2	7.5	50	1.47	4	Yes	1
2D200R010-0604	●	**2.0**	0.10	1.5	6.0	50	1.97	4	Yes	1
2D200R020-0604	●	**2.0**	0.20	1.5	6.0	50	1.97	4	Yes	1
2D200R030-0604	●	**2.0**	0.30	1.5	6.0	50	1.97	4	Yes	1
BNBR 2D200R050-0604	●	**2.0**	0.50	1.5	6.0	50	1.97	4	Yes	1

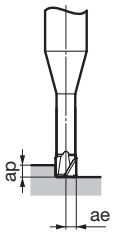
Grade: BNX20

Identification Code

BNBR 2 D050 R010 - 015 4

Series Code	No. of Flutes	Dia.	Corner Radius	Neck Length	Shank Dia.

BNBR type



Recommended Cutting Conditions

1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
   Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.

Work Material			STAVAX, NAK80, SKD61 (Up to 52HRC)				ELMAX, DC53, SKD11 Modified (Up to 62HRC)				YXR3, SKH (Up to 70HRC)			
DC (mm)	RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	ae (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	ae (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	ae (mm)
0.2	0.05	0.5	40,000	400	0.005	0.03	40,000	400	0.005	0.03	40,000	250	0.005	0.02
0.3	0.05	0.5	40,000	500	0.010	0.05	40,000	500	0.010	0.05	40,000	300	0.005	0.03
0.4	0.05	0.5	40,000	600	0.015	0.1	40,000	600	0.015	0.1	40,000	400	0.01	0.05
0.5	0.05	0.5	40,000	600	0.02	0.15	40,000	600	0.02	0.15	40,000	400	0.01	0.1
	0.05	1.5	40,000		0.02	0.1	40,000		0.02	0.1	35,000			0.05
	0.1		40,000				40,000				35,000			
	0.05	2.5	40,000		0.01	0.05	40,000		0.01	0.05	35,000			
	0.1		40,000				40,000				35,000			
1.0	0.05	3.0	35,000	800	0.03	0.3	35,000	800	0.03	0.2	30,000	600	0.01	0.1
	0.1		35,000				35,000				30,000			
	0.2		35,000				35,000				30,000			
	0.3		35,000				35,000				30,000			
	0.05	5.0	35,000		0.02	0.2	35,000	800	0.02	0.1	30,000	600	0.01	0.1
	0.1		35,000				35,000				30,000			
	0.2		35,000				35,000				30,000			
	0.3		35,000				35,000				30,000			
1.5	0.1	4.5	26,000	800	0.03	0.5	26,000	800	0.03	0.3	20,000	600	0.02	0.3
	0.2		26,000				26,000				20,000			
	0.3		26,000				26,000				20,000			
	0.1	7.5	26,000		0.03	0.5	26,000	800	0.03	0.3	20,000	600	0.02	0.3
	0.2		26,000				26,000				20,000			
	0.3		26,000				26,000				20,000			
2.0	0.1	6.0	20,000	800	0.03	0.7	20,000	800	0.03	0.7	15,000	600	0.03	0.7
	0.2		20,000				20,000				15,000			
	0.3		20,000				20,000				15,000			
	0.5		20,000				20,000				15,000			

GSXB 20000 type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

2 Flutes | GSX Coat | Ballnose R | 30° Helix Angle | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1

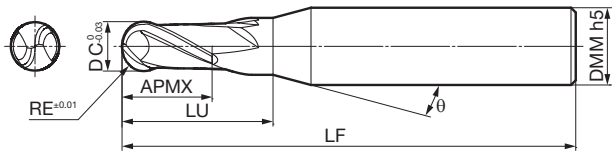
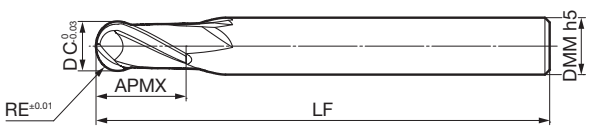


Fig 2



DC	θ
≤ ø2	10°
ø2 or more	15°

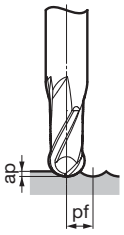
Body

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSXB 20020	●	**0.20**	**0.4**	0.6	0.8	50	4	1
20030	●	**0.30**	**0.6**	0.9	1.2	50	4	1
20050	●	**0.50**	**1.0**	1.5	2.0	50	4	1
20075	●	**0.75**	**1.5**	2.5	3.0	50	4	1
20100	●	**1.00**	**2.0**	3.0	4.0	60	6	1
GSXB 20125	●	**1.25**	**2.5**	4.0	5.0	60	6	1
20150	●	**1.50**	**3.0**	4.5	6.0	60	6	1
20200	●	**2.00**	**4.0**	6.0	8.0	70	6	1
20250	●	**2.50**	**5.0**	7.5	10.0	80	6	1
20300	●	**3.00**	**6.0**	9.0	—	80	6	2
GSXB 20350	●	**3.50**	**7.0**	11.0	20.0	90	8	1
20400	●	**4.00**	**8.0**	12.0	—	90	8	2
20500	●	**5.00**	**10.0**	15.0	—	100	10	2
20600	●	**6.00**	**12.0**	18.0	—	110	12	2
20700	●	**7.00**	**14.0**	21.0	38.0	110	16	1
GSXB 20800	●	**8.00**	**16.0**	24.0	—	140	16	2
20900	●	**9.00**	**18.0**	27.0	50.0	140	20	1
21000	●	**10.00**	**20.0**	30.0	—	160	20	2

Grade: ACB20

GSXB 20000 type



Recommended Cutting Conditions

1. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.
2. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Radius Milling

Work Material / Cutting Conditions RE (mm)		Carbon Steel / Alloy Steel (Below 25HRC)		Carbon Steel / Alloy Steel (Below 50HRC)		Cast Iron Special Cast Iron		Stainless Steel Titanium Alloy	
		Spindle Speed (min $^{-1}$)	Feed Rate (mm/min)	Spindle Speed (min $^{-1}$)	Feed Rate (mm/min)	Spindle Speed (min $^{-1}$)	Feed Rate (mm/min)	Spindle Speed (min $^{-1}$)	Feed Rate (mm/min)
0.20		50,000	2,100	35,000	1,150	50,000	2,100	50,000	1,750
0.30		50,000	2,500	35,000	1,350	50,000	2,500	50,000	2,100
0.50		50,000	3,000	35,000	1,600	50,000	3,000	50,000	2,500
0.75		35,000	3,000	24,000	1,650	35,000	3,200	34,000	2,500
1.00		27,500	3,000	19,000	1,700	35,000	3,900	26,000	2,500
1.25		22,500	3,000	15,500	1,700	28,000	3,900	21,000	2,500
1.50		19,000	3,000	13,000	1,700	24,000	3,900	17,500	2,500
2.00		17,000	3,800	12,000	2,100	20,000	4,100	15,000	2,700
2.50		15,500	4,300	11,000	2,200	18,000	4,600	12,000	2,500
3.00		14,000	4,700	10,500	2,500	16,500	5,300	10,500	2,500
3.50		12,500	4,200	9,000	2,100	14,000	4,500	9,000	2,200
4.00		11,000	3,500	7,900	1,900	12,500	4,000	7,800	1,900
5.00		9,000	2,800	6,300	1,500	10,500	3,300	6,300	1,500
6.00		7,500	2,400	5,200	1,250	8,700	2,800	5,200	1,250
7.00		6,400	2,100	4,500	1,100	7,400	2,400	4,500	1,100
8.00		5,600	1,800	3,900	950	6,500	2,100	3,900	950
9.00		5,000	1,600	3,500	850	5,800	1,900	3,500	850
10.00		4,500	1,450	3,100	750	5,200	1,700	3,150	750
Standard Depth of Cut	ap	0.02DC		0.02DC		0.02DC		0.02DC	
	pf	0.05DC		0.05DC		0.05DC		0.05DC	

GSBH 20000SF type

Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Hardened Steel 60 to 65HRC

2 Flutes | GS HARD Coat | Ballnose R | 25° Helix Angle | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1

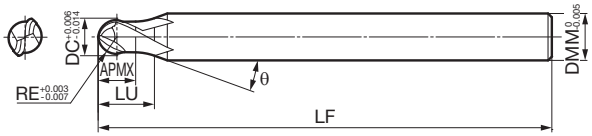
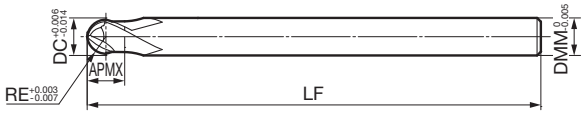


Fig 2



DC	θ
< ø2	10°
ø2 or more	15°

Body

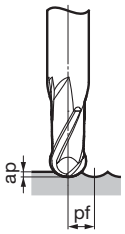
Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSBH 20020SF	●	**0.20**	**0.4**	0.4	0.6	50	4	1
20030SF	●	**0.30**	**0.6**	0.6	0.9	50	4	1
20050SF	●	**0.50**	**1.0**	1.0	1.5	50	4	1
20075SF	●	**0.75**	**1.5**	1.5	2.3	50	4	1
20100SF	●	**1.00**	**2.0**	2.0	3.0	60	6	1
GSBH 20125SF	●	**1.25**	**2.5**	2.5	3.8	60	6	1
20150SF	●	**1.50**	**3.0**	3.0	4.5	60	6	1
20200SF	●	**2.00**	**4.0**	4.0	6.0	70	6	1
20250SF	●	**2.50**	**5.0**	5.0	7.5	80	6	1
20300SF	●	**3.00**	**6.0**	6.0	—	80	6	2
GSBH 20400SF	●	**4.00**	**8.0**	8.0	—	90	8	2
20500SF	●	**5.00**	**10.0**	10.0	—	100	10	2
20600SF	●	**6.00**	**12.0**	12.0	—	110	12	2

Grade: ACF07D

Recommended Cutting Conditions

1. When the depth of cut is lowered, feed rate can be increased further.
2. If the machine is not suited to the recommended spindle speed, please use the maximum spindle speed available.
   In this case, lower the feed rate by the same ratio.
3. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Radius Milling

Work Material / Cutting Conditions / RE (mm)	Medium Hardened Steel Pre-hardened Steel, Die Steel (40 to 50HRC)		Hardened Steel SKD61 (50 to 55HRC)		Hardened Steel SKD11 (55 to 60HRC)		Hardened Steel SKH55 (60 to 65HRC)	
	Spindle Speed (min -1)	Feed Rate (mm/min)	Spindle Speed (min -1)	Feed Rate (mm/min)	Spindle Speed (min -1)	Feed Rate (mm/min)	Spindle Speed (min -1)	Feed Rate (mm/min)
0.20	50,000	500	50,000	500	50,000	500	50,000	500
0.30	50,000	800	50,000	800	50,000	800	50,000	700
0.50	50,000	1,400	50,000	1,400	50,000	1,300	42,000	1,000
0.75	50,000	2,000	50,000	2,000	37,300	1,400	28,000	1,000
1.00	38,100	2,100	38,100	2,100	28,000	1,400	21,000	1,000
1.25	30,500	2,100	30,500	2,100	22,400	1,400	16,800	1,000
1.50	25,400	2,100	25,400	2,100	18,700	1,400	14,000	1,000
2.00	19,100	2,100	19,100	2,100	14,000	1,400	10,500	1,000
2.50	15,300	2,100	15,300	2,100	11,200	1,400	8,400	1,000
3.00	12,700	2,100	12,700	2,100	9,300	1,400	7,000	1,000
4.00	9,500	2,100	9,500	2,100	7,000	1,400	5,300	1,000
5.00	7,600	2,100	7,600	2,100	5,600	1,400	4,200	1,000
6.00	6,400	2,100	6,400	2,100	4,700	1,400	3,500	1,000
Standard Depth of Cut ap	0.08DC				0.05DC			
Standard Depth of Cut pf	0.25DC				0.15DC			

SNB 2000DL type

Aluminum Alloy | Copper Alloy

2 Flutes | AURORA Coat DLC | Ballnose R | 30° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | R-Grooving | Profiling

Fig 1

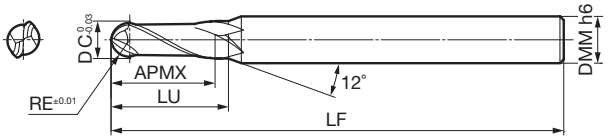


Fig 2

Body

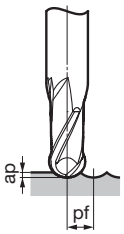
Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SNB 2020DL	●	**1.0**	**2.0**	3.0	5	60	6	1
2030DL	●	**1.5**	**3.0**	4.5	8	80	6	1
2040DL	●	**2.0**	**4.0**	6.0	12	80	6	1
2050DL	●	**2.5**	**5.0**	7.5	14	90	6	1
2060DL	●	**3.0**	**6.0**	9.0	—	100	6	2
SNB 2080DL	●	**4.0**	**8.0**	12.0	—	100	8	2
2100DL	●	**5.0**	**10.0**	15.0	—	120	10	2
2120DL	●	**6.0**	**12.0**	18.0	—	120	12	2
2160DL	●	**8.0**	**16.0**	24.0	—	160	16	2

Grade: DL1200

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Radius Milling

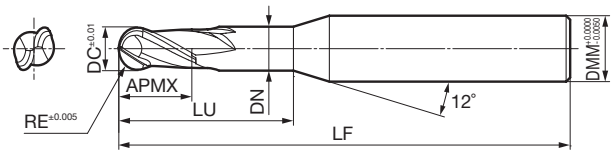
Work Material		Aluminum Alloy			
Cutting Conditions		Wet		Dry	
RE (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0		48,000	1,500	48,000	1,000
1.5		38,000	2,100	38,000	1,500
2.0		31,000	2,800	31,000	2,000
2.5		24,000	2,800	24,000	2,000
3.0		20,000	2,800	20,000	2,000
4.0		15,000	2,800	15,000	2,000
5.0		13,000	3,000	13,000	2,100
6.0		10,000	3,000	10,000	2,100
8.0		7,700	3,000	7,700	2,100
Standard Depth of Cut	ap	0.1DC		0.1DC	
	pf	0.2DC		0.2DC	

SNB2 type

Aluminum Alloy | Copper Alloy

2 Flutes | AURORA Coat DLC | Ballnose R | 30° Helix Angle | Shoulder Milling | Groove Finishing | R-Grooving | Profiling | For Copper Electrodes

Fig 1



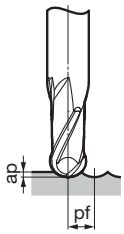
Body

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Fig
SNB2 0005 0034DL	●	**0.05**	**0.1**	0.1	0.3	45	0.09	4	1
0005 0064DL	●	**0.05**	**0.1**	0.1	0.6	45	0.09	4	1
0010 0054DL	●	**0.10**	**0.2**	0.2	0.5	45	0.18	4	1
0010 0104DL	●	**0.10**	**0.2**	0.2	1.0	45	0.18	4	1
0010 0204DL	●	**0.10**	**0.2**	0.2	2.0	45	0.18	4	1
SNB2 0015 0054DL	●	**0.15**	**0.3**	0.3	0.5	45	0.27	4	1
0015 0104DL	●	**0.15**	**0.3**	0.3	1.0	45	0.27	4	1
0015 0204DL	●	**0.15**	**0.3**	0.3	2.0	45	0.27	4	1
0015 0304DL	●	**0.15**	**0.3**	0.3	3.0	45	0.27	4	1
0020 0104DL	●	**0.20**	**0.4**	0.4	1.0	45	0.36	4	1
SNB2 0020 0204DL	●	**0.20**	**0.4**	0.4	2.0	45	0.36	4	1
0020 0304DL	●	**0.20**	**0.4**	0.4	3.0	45	0.36	4	1
0020 0404DL	●	**0.20**	**0.4**	0.4	4.0	45	0.36	4	1
0025 0104DL	●	**0.25**	**0.5**	0.45	1.0	45	0.45	4	1
0025 0204DL	●	**0.25**	**0.5**	0.45	2.0	45	0.45	4	1
SNB2 0025 0304DL	●	**0.25**	**0.5**	0.45	3.0	45	0.45	4	1
0025 0404DL	●	**0.25**	**0.5**	0.45	4.0	45	0.45	4	1
0030 0204DL	●	**0.30**	**0.6**	0.6	2.0	45	0.54	4	1
0030 0304DL	●	**0.30**	**0.6**	0.6	3.0	45	0.54	4	1
0030 0404DL	●	**0.30**	**0.6**	0.6	4.0	45	0.54	4	1
SNB2 0030 0504DL	●	**0.30**	**0.6**	0.6	5.0	45	0.54	4	1
0030 0604DL	●	**0.30**	**0.6**	0.6	6.0	45	0.54	4	1
0050 0304DL	●	**0.50**	**1.0**	1.5	3.0	45	0.90	4	1
0050 0404DL	●	**0.50**	**1.0**	1.5	4.0	45	0.90	4	1
0050 0604DL	●	**0.50**	**1.0**	1.5	6.0	45	0.90	4	1
SNB2 0050 0804DL	●	**0.50**	**1.0**	1.5	8.0	50	0.90	4	1
0050 1004DL	●	**0.50**	**1.0**	1.5	10.0	50	0.90	4	1
0075 0304DL	●	**0.75**	**1.5**	2.3	3.0	45	1.35	4	1
0075 0604DL	●	**0.75**	**1.5**	2.3	6.0	45	1.35	4	1
0075 1004DL	●	**0.75**	**1.5**	2.3	10.0	50	1.35	4	1
SNB2 0100 0304DL	●	**1.00**	**2.0**	3.0	3.0	50	1.80	4	1
0100 0604DL	●	**1.00**	**2.0**	3.0	6.0	50	1.80	4	1
0100 1004DL	●	**1.00**	**2.0**	3.0	10.0	50	1.80	4	1
0100 1504DL	●	**1.00**	**2.0**	3.0	15.0	60	1.80	4	1
0100 2004DL	●	**1.00**	**2.0**	3.0	20.0	60	1.80	4	1
SNB2 0200 1606DL	●	**2.00**	**4.0**	6.0	16.0	80	3.60	6	1
0200 2006DL	●	**2.00**	**4.0**	6.0	20.0	80	3.60	6	1
0200 3006DL	●	**2.00**	**4.0**	6.0	30.0	80	3.60	6	1

Grade: DL1200

SNB2 type



Recommended Cutting Conditions

1. For radius processing, reduce the feed to half the recommended feed.
2. Insoluble cutting oil is recommended.
3. Because of the high spindle speeds, runout of the endmill when mounted should be less than 10 µm.

Radius Milling

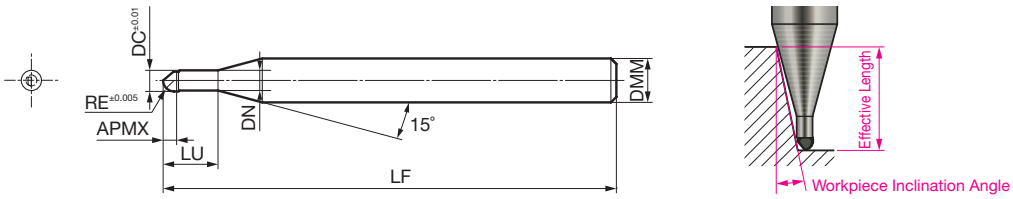
Work Material / Cutting Conditions / Cat. No.	Copper Alloy			
	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	Standard depth of cut (mm) ap	ae
SNB2 0005 0034DL	20,000 -50,000	90	0.005	0.005
0005 0064DL		80	0.005	0.005
SNB2 0010 0054DL	20,000 -50,000	350	0.01	0.02
0010 0104DL		350	0.007	0.015
0010 0204DL		200	0.005	0.005
SNB2 0015 0054DL	20,000 -50,000	400	0.015	0.025
0015 0104DL		400	0.01	0.02
0015 0204DL		300	0.007	0.01
0015 0304DL		250	0.005	0.008
SNB2 0020 0104DL	20,000 -30,000	800	0.025	0.05
0020 0204DL		700	0.02	0.03
0020 0304DL		600	0.015	0.02
0020 0404DL		400	0.007	0.015
SNB2 0025 0104DL	20,000 -30,000	1,000	0.04	0.07
0025 0204DL		800	0.03	0.06
0025 0304DL		700	0.02	0.05
0025 0404DL		600	0.015	0.04
SNB2 0030 0204DL	20,000 -30,000	1,400	0.05	0.15
0030 0304DL		1,200	0.04	0.1
0030 0404DL		1,000	0.03	0.07
0030 0504DL		700	0.03	0.06
0030 0604DL		600	0.015	0.03
SNB2 0050 0304DL	20,000 -30,000	3,500	0.2	0.4
0050 0404DL		3,000	0.15	0.4
0050 0604DL		2,500	0.13	0.3
0050 0804DL		2,000	0.07	0.15
0050 1004DL		1,200	0.04	0.07
SNB2 0075 0304DL	20,000	4,000	0.25	0.4
0075 0604DL	20,000	3,200	0.15	0.4
0075 1004DL	20,000	2,000	0.1	0.3
SNB2 0100 0304DL	16,000	4,500	0.4	0.6
0100 0604DL	16,000	3,500	0.35	0.6
0100 1004DL	16,000	3,000	0.25	0.4
0100 1504DL	12,000	2,000	0.15	0.3
0100 2004DL	10,000	1,500	0.1	0.2
SNB2 0200 1606DL	16,000	4,000	0.4	0.8
0200 2006DL	16,000	3,500	0.4	0.8
0200 3006DL	12,000	3,000	0.2	0.4

NPDBS type

Cemented Carbide | Hard Brittle Material

1 Flute | Binderless PCD | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body (for Standard Finishing)

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Effective Length for Workpiece Inclination Angle 0.5°	1°	1.5°	2°	3°	Fig
NPDBS 1010-004	●	**0.1**	**0.2**	0.1	0.4	40	0.18	4	0.42	0.43	0.44	0.46	0.48	1
1020-008	●	**0.2**	**0.4**	0.2	0.8	40	0.38	4	0.83	0.85	0.87	0.90	0.95	1
1030-010	●	**0.3**	**0.6**	0.3	1.0	40	0.58	4	1.03	1.06	1.08	1.11	1.17	1
1050-020	●	**0.5**	**1.0**	0.5	2.0	40	0.95	4	2.10	2.15	2.20	2.26	2.39	1
1100-030	●	**1.0**	**2.0**	1.0	3.0	40	1.95	4	3.11	3.18	3.25	3.33	3.51	1

Grade: NPD10

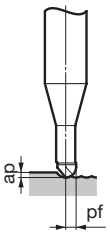
Identification Code

NPDB S 1 010 - 004

Series Code	For Standard Finishing	No. of Flutes	Ballnose Radius	Neck Length

Recommended Cutting Conditions

1. Use a machine with high accuracy for stable cutting.
2. Non-water soluble coolant recommended. Supply as a mist or external coolant. Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine specs and other conditions may vary.
5. The cutting parameters shown are for reference only. Adjust the cutting conditions to the desired machined surface finish.



Work Material		Cemented Carbide			
RE (mm)	LU (mm)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	ap(mm)	pf(mm)
0.1	0.4	40,000	100	0.001	0.001
0.2	0.8	40,000	150	0.002	0.001
0.3	1.0	40,000	200	0.003	0.001
0.5	2.0	40,000	400	0.005	0.003
1.0	3.0	40,000	600	0.010	0.005

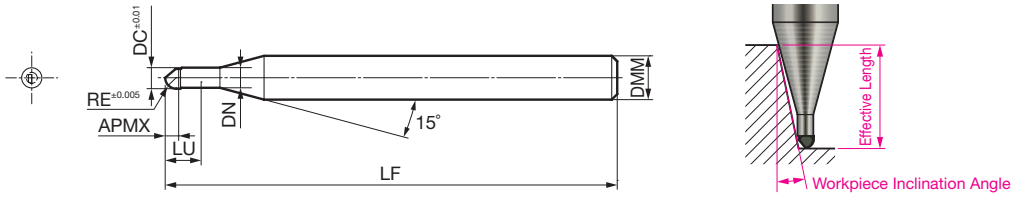
* Radius accuracy inspection report is included inside the case. ☞I135
* Long neck type is also available depending on the size. Please consult us separately.

NPDB type

Cemented Carbide | Hard Brittle Material

1 Flute | Binderless PCD | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body (for Precise Finishing)

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Effective Length for Workpiece Inclination Angle 0.5°	1°	1.5°	2°	3°	Fig
NPDB 1010-004	●	**0.1**	**0.2**	0.1	0.4	40	0.18	4	0.42	0.43	0.44	0.46	0.48	1
1020-008	●	**0.2**	**0.4**	0.2	0.8	40	0.38	4	0.83	0.85	0.87	0.90	0.95	1
1030-010	●	**0.3**	**0.6**	0.3	1.0	40	0.58	4	1.03	1.06	1.08	1.11	1.17	1
1050-020	●	**0.5**	**1.0**	0.5	2.0	40	0.95	4	2.10	2.15	2.20	2.26	2.39	1
1100-030	●	**1.0**	**2.0**	1.0	3.0	40	1.95	4	3.11	3.18	3.25	3.33	3.51	1

Grade: NPD10

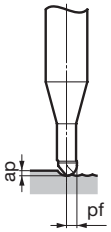
Identification Code

NPDB 1 010 - 004

Series Code	No. of Flutes	Ballnose Radius	Neck Length

Recommended Cutting Conditions

1. Use a machine with high accuracy for stable cutting.
2. Non-water soluble coolant recommended. Supply as a mist or external coolant. Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine specs and other conditions may vary.
5. The cutting parameters shown are for reference only. Adjust the cutting conditions to the desired machined surface finish.



Work Material		Cemented Carbide			
RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)
0.1	0.4	40,000	100	0.001	0.001
0.2	0.8	40,000	150	0.002	0.001
0.3	1.0	40,000	200	0.003	0.001
0.5	2.0	40,000	400	0.005	0.003
1.0	3.0	40,000	600	0.010	0.005

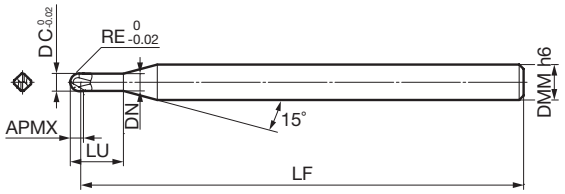
* Radius accuracy inspection report is included inside the case. I135
* Long neck type is also available depending on the size. Please consult us separately.

SDCB type

Cemented Carbide | Hard Brittle Material

2 Flutes | SUMIDIA Coat | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body (For Rough/Medium-Finishing)

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Fig
SDCB 2R050-015	●	**0.5**	**1.0**	0.6	1.5	50	0.94	4	1
2R050-020	●	**0.5**	**1.0**	0.6	2.0	50	0.94	4	1
2R050-030	●	**0.5**	**1.0**	0.6	3.0	50	0.94	4	1
2R050-050	●	**0.5**	**1.0**	0.6	5.0	50	0.94	4	1
SDCB 2R100-025	●	**1.0**	**2.0**	1.4	2.5	50	1.92	4	1
2R100-040	●	**1.0**	**2.0**	1.4	4.0	50	1.92	4	1
2R100-060	●	**1.0**	**2.0**	1.4	6.0	50	1.92	4	1
2R100-100	●	**1.0**	**2.0**	1.4	10.0	50	1.92	4	1

Grade: DCM20

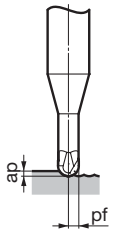
Identification Code

SDCB 2 R050 - 015

- SDCB: Series Code
- 2: No. of Flutes
- R050: Ballnose Radius
- 015: Neck Length

Recommended Cutting Conditions

1. Use a machine with high accuracy for stable cutting.
2. Air blow is recommended, but oil mist or external coolant supply can also be used. Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine specs and other conditions may vary.
5. The cutting parameters shown are for reference only. Adjust the cutting conditions to the desired machined surface finish.



Work Material		Cemented Carbide			
RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)
0.5	1.5	30,000	300	0.05	0.25
1.0	2.5	30,000	300	0.10	0.30

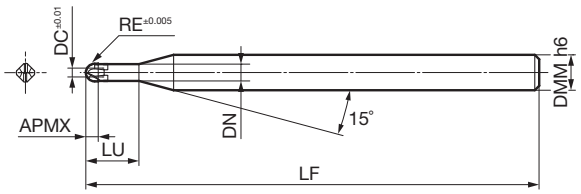
MEMO

BNBP type

Pre-hardened Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Hardened Steel 60 to 65HRC

2 Flutes | CBN | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Fig
BNBP 2R020-0124	●	**0.20**	**0.4**	0.3	1.2	50	0.37	4	1
2R020-0126	●	**0.20**	**0.4**	0.3	1.2	50	0.37	6	1
2R020-0204	●	**0.20**	**0.4**	0.3	2.0	50	0.37	4	1
2R020-0304	●	**0.20**	**0.4**	0.3	3.0	50	0.37	4	1
2R020-0404	●	**0.20**	**0.4**	0.3	4.0	50	0.37	4	1
BNBP 2R030-0154	●	**0.30**	**0.6**	0.4	1.5	50	0.57	4	1
2R030-0156	●	**0.30**	**0.6**	0.4	1.5	50	0.57	6	1
2R030-0204	●	**0.30**	**0.6**	0.4	1.5	50	0.57	4	1
2R030-0304	●	**0.30**	**0.6**	0.4	3.0	50	0.57	4	1
2R030-0404	●	**0.30**	**0.6**	0.4	4.0	50	0.57	4	1
BNBP 2R030-0504	●	**0.30**	**0.6**	0.4	5.0	50	0.57	4	1
2R030-0604	●	**0.30**	**0.6**	0.4	6.0	50	0.57	4	1
2R050-0254	●	**0.50**	**1.0**	0.6	2.5	50	0.97	4	1
2R050-0256	●	**0.50**	**1.0**	0.6	2.5	50	0.97	6	1
2R050-0304	●	**0.50**	**1.0**	0.6	3.0	50	0.97	4	1
BNBP 2R050-0404	●	**0.50**	**1.0**	0.6	4.0	50	0.97	4	1
2R050-0604	●	**0.50**	**1.0**	0.6	6.0	50	0.97	4	1
2R050-0804	●	**0.50**	**1.0**	0.6	8.0	50	0.97	4	1
2R075-0404	●	**0.75**	**1.5**	0.9	4.0	50	1.47	4	1
2R075-0406	●	**0.75**	**1.5**	0.9	4.0	50	1.47	6	1
BNBP 2R100-0554	●	**1.00**	**2.0**	1.4	5.5	50	1.97	4	1
2R100-0556	●	**1.00**	**2.0**	1.4	5.5	50	1.97	6	1
2R100-0804	●	**1.00**	**2.0**	1.4	8.0	50	1.97	4	1

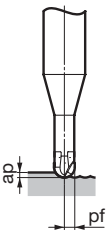
Grade: BN350

Identification Code

BNBP 2 R030 - 015 4

Series Code	No. of Flutes	Ballnose Radius	Neck Length	Shank Dia.

BNBP type



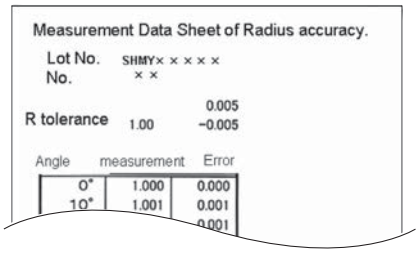
Recommended Cutting Conditions

1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
   Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.

Work Material		STAVAX, NAK80, SKD61 (Up to 52HRC)				ELMAX, DC53, SKD11 Modified (Up to 62HRC)				YXR3, SKH (Up to 70HRC)			
RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)
0.2	1.2	40,000	1,000	0.005	0.010	40,000	800	0.005	0.010	40,000	600	0.005	0.005
	2.0	40,000	800	0.005	0.010	40,000	600	0.005	0.010	40,000	400	0.005	0.005
	3.0	40,000	600	0.005	0.010	40,000	500	0.005	0.010	40,000	300	0.005	0.005
	4.0	40,000	500	0.005	0.010	40,000	400	0.005	0.005	40,000	200	0.005	0.005
0.3	1.5	40,000	1,600	0.020	0.020	40,000	1,400	0.010	0.020	40,000	1,200	0.010	0.020
	2.0	40,000	1,500	0.010	0.020	40,000	1,300	0.010	0.020	40,000	1,100	0.010	0.010
	3.0	40,000	1,400	0.010	0.020	40,000	1,200	0.010	0.020	40,000	1,000	0.010	0.010
	4.0	30,000	1,200	0.010	0.010	30,000	1,000	0.010	0.010	30,000	700	0.005	0.010
	5.0	30,000	800	0.010	0.010	30,000	700	0.005	0.010	30,000	600	0.005	0.005
	6.0	30,000	600	0.005	0.010	30,000	500	0.005	0.005	30,000	400	0.005	0.005
0.5	2.5	40,000	2,800	0.040	0.050	40,000	2,800	0.030	0.040	40,000	2,200	0.020	0.030
	3.0	40,000	2,600	0.040	0.050	40,000	2,600	0.030	0.040	40,000	2,100	0.020	0.030
	4.0	40,000	2,400	0.030	0.050	40,000	2,400	0.020	0.030	40,000	2,000	0.020	0.020
	6.0	25,000	1,500	0.020	0.030	25,000	1,500	0.010	0.020	25,000	1,300	0.010	0.010
	8.0	16,000	1,200	0.020	0.020	16,000	1,100	0.010	0.020	16,000	850	0.010	0.010
0.75	4.0	32,000	2,400	0.030	0.030	32,000	2,200	0.020	0.030	32,000	2,000	0.020	0.020
1.0	5.5	40,000	4,000	0.050	0.050	40,000	4,000	0.030	0.030	40,000	3,000	0.020	0.030
	8.0	32,000	3,000	0.030	0.050	32,000	2,600	0.020	0.030	32,000	2,200	0.010	0.020

■ Radius Accuracy Inspection Test Results

Radius accuracy inspection report is attached as below with the ballnose type.


Measurement Data Sheet of Radius accuracy.

Lot No. SHMY× × × × ×
No. × ×

R tolerance 1.00 0.005 −0.005

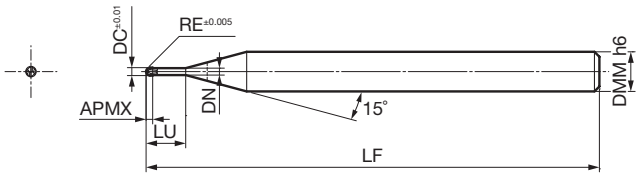
Angle	measurement	Error
0°	1.000	0.000
10°	1.001	0.001

BNBC type

Copper Alloy

2 Flutes | CBN | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Fig
BNBC 2R010-0034	●	**0.1**	**0.2**	0.2	0.3	50	0.17	4	1
2R010-0104	●	**0.1**	**0.2**	0.2	1.0	50	0.17	4	1
2R020-0054	●	**0.2**	**0.4**	0.3	0.5	50	0.37	4	1
2R020-0204	●	**0.2**	**0.4**	0.3	2.0	50	0.37	4	1
2R030-0104	●	**0.3**	**0.6**	0.4	1.0	50	0.57	4	1
BNBC 2R030-0304	●	**0.3**	**0.6**	0.4	3.0	50	0.57	4	1
2R050-0304	●	**0.5**	**1.0**	0.6	3.0	50	0.97	4	1

Grade: BN700

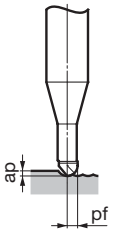
Identification Code

BNBC 2 R030 - 010 4

Series Code | No. of Flutes | Ballnose Radius | Neck Length | Shank Dia.

Recommended Cutting Conditions

1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
   Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.



Side Milling

Work Material / Cutting Conditions / Cat. No.	Copper Alloy			
	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Standard depth of cut (mm) ap	pf
BNBC 2R010-0034	20,000 -50,000	350	0.01	0.02
2R010-0104		350	0.007	0.015
BNBC 2R020-0054	20,000 -50,000	800	0.025	0.05
2R020-0204		700	0.02	0.03
BNBC 2R030-0104	20,000 -50,000	1,400	0.05	0.15
2R030-0304		1,200	0.04	0.1
BNBC 2R050-0304	20,000 -50,000	2,200	0.15	0.35

MEMO

GSXSLT 30000C-1.5D type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

3 Flutes | GSX Coat | Corner | 40° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing | Helical Milling | Ramping

Fig 1

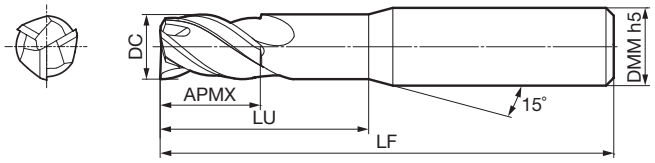
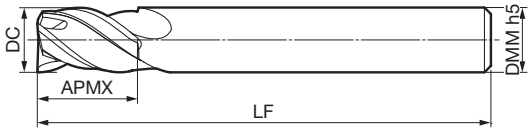


Fig 2



DC	Tolerance
D ≤ 3.0	0 -0.015
3.0 < D ≤ 12	0 -0.020
12.0 < D	0 -0.030

Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
GSXSLT 30100C-1.5D	●	**1.0**	1.5	2.5	40	4	1
30150C-1.5D	●	**1.5**	2.3	3.3	40	4	1
30200C-1.5D	●	**2.0**	3.0	4.0	40	4	1
30250C-1.5D	●	**2.5**	3.8	4.8	40	4	1
30300C-1.5D	●	**3.0**	4.5	6.0	45	6	1
GSXSLT 30400C-1.5D	●	**4.0**	6.0	7.5	45	6	1
30500C-1.5D	●	**5.0**	7.5	9.5	50	6	1
30600C-1.5D	●	**6.0**	9.0	—	50	6	2
30700C-1.5D	●	**7.0**	11.0	13.0	60	8	1
30800C-1.5D	●	**8.0**	12.0	—	60	8	2
GSXSLT 30900C-1.5D	●	**9.0**	14.0	16.0	70	10	1
31000C-1.5D	●	**10.0**	15.0	—	70	10	2
31200C-1.5D	●	**12.0**	18.0	—	75	12	2

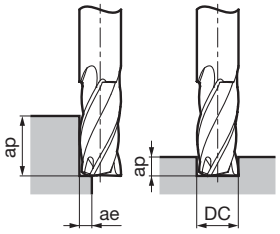
Grade: ACF20

Identification Code

GSXSLT 3 0100 C - 1.5D

Series Code	No. of Flutes	Dia.	Corner Style C: Gash Land	Cutting Edge Length

GSXSLT 30000C-1.5D type



Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blow when dry machining.
3. Use wet machining for stainless steel, heat-resistant alloy, and titanium alloy applications.
4. Use step machining of 0.1 DC when drilling stainless steel, heat-resistant alloy, and titanium alloy.
5. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.

Side Milling

Work Material / Cutting Conditions	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 50HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0	19,600	300	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	90	9,000	65
2.0	11,200	410	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	120	5,300	90
4.0	6,400	550	6,400	550	6,400	550	6,000	370	4,200	230	3,000	140	3,600	150	3,000	120
6.0	4,600	670	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,700	180	2,200	130
8.0	3,400	670	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	180	1,600	130
10.0	2,800	670	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	180	1,300	130
12.0	2,300	670	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	180	1,100	130
Standard Depth of Cut ap	1.5DC										1.0DC					
Standard Depth of Cut ae	0.05DC										0.02DC					

Groove Milling

Work Material / Cutting Conditions	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 50HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0	19,600	240	19,600	300	19,600	300	18,300	210	12,700	130	9,000	80	11,000	65	4,500	25
2.0	11,200	320	11,200	410	11,200	410	10,500	280	7,300	170	5,300	100	6,400	85	2,650	35
4.0	6,400	450	6,400	550	6,400	550	6,000	370	4,200	230	3,000	140	3,600	100	1,500	50
6.0	4,600	540	4,600	670	4,600	670	4,300	460	3,000	270	2,200	170	2,650	130	1,150	55
8.0	3,400	540	3,400	670	3,400	670	3,200	460	2,200	270	1,600	170	2,000	130	800	55
10.0	2,800	540	2,800	670	2,800	670	2,600	460	1,800	270	1,300	170	1,600	130	650	55
12.0	2,300	540	2,300	670	2,300	670	2,200	460	1,500	270	1,100	170	1,300	130	500	55
Standard Depth of Cut ap	0.2DC		0.5DC						0.2DC		0.05DC		0.2DC			

Drilling

Work Material / Cutting Conditions	Structural Steel SS		Carbon Steel SC (150 to 250HB)		Cast Iron FC		Alloy Steel SCM (25 to 35HRC)		Tempered Steel, Hardened Steel NAK , HPM (35 to 45HRC)		Hardened Steel (45 to 50HRC)		Stainless Steel SUS304,SUS316		Heat-Resistant Alloy Titanium Alloy	
DC (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
1.0	19,600	70	19,600	90	19,600	90	18,300	60	12,700	40	9,000	25	11,000	20	4,500	10
2.0	11,200	90	11,200	120	11,200	120	10,500	80	7,300	50	5,300	30	6,400	25	2,650	15
4.0	6,400	130	6,400	160	6,400	160	6,000	110	4,200	70	3,000	40	3,600	30	1,500	20
6.0	4,600	160	4,600	200	4,600	200	4,300	130	3,000	80	2,200	50	2,650	40	1,150	20
8.0	3,400	160	3,400	200	3,400	200	3,200	130	2,200	80	1,600	50	2,000	40	800	20
10.0	2,800	160	2,800	200	2,800	200	2,600	130	1,800	80	1,300	50	1,600	40	650	20
12.0	2,300	160	2,300	200	2,300	200	2,200	130	1,500	80	1,100	50	1,300	40	500	20

SSUP 3000ZX type

General Steel | Carbon Steel | Alloy Steel | Pre-hardened Steel | Tempered Steel / Die Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Stainless Steel | Ti Alloy / Heat Resistant Alloy | Cast Iron

3 Flutes | ZX Coat | Corner | 50° Helix Angle | Shoulder Milling | Groove Milling | Groove Finishing | Face Milling | Spot Facing | Helical Milling | Ramping

Fig 1

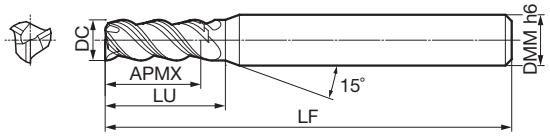


Fig 2

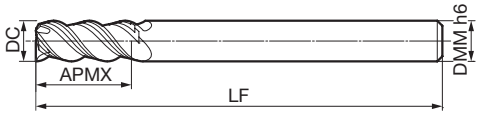
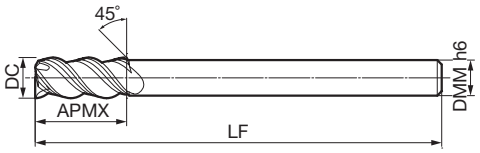


Fig 3



DC	Tolerance
D ≤ 3.0	-0.014 -0.028
3.0 < D ≤ 6.0	-0.020 -0.038
6.0 < D	-0.025 -0.047

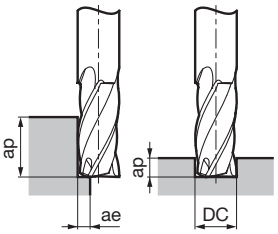
Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
SSUP 3020ZX	●	**2.0**	6.0	7.0	50	4	1
3025ZX	●	**2.5**	8.0	9.0	50	4	1
3030ZX	●	**3.0**	8.0	9.5	50	6	1
3035ZX	●	**3.5**	10.0	11.5	50	6	1
3040ZX	●	**4.0**	11.0	12.5	50	6	1
SSUP 3045ZX	●	**4.5**	11.0	12.5	50	6	1
3050ZX	●	**5.0**	13.0	14.5	60	6	1
3055ZX	●	**5.5**	13.0	14.5	60	6	1
3060ZX	●	**6.0**	13.0	—	60	6	2
3065ZX	●	**6.5**	16.0	18.0	70	8	1
SSUP 3070ZX	●	**7.0**	16.0	18.0	70	8	1
3075ZX	●	**7.5**	16.0	18.0	70	8	1
3080ZX	●	**8.0**	19.0	—	80	8	2
3085ZX	●	**8.5**	19.0	21.5	90	10	1
3090ZX	●	**9.0**	19.0	21.5	90	10	1
SSUP 3095ZX	●	**9.5**	19.0	21.5	90	10	1
3100ZX	●	**10.0**	22.0	—	90	10	2
3110ZX	●	**11.0**	22.0	24.5	90	12	1
3120ZX	●	**12.0**	26.0	—	90	12	2
3130ZX	●	**13.0**	26.0	—	100	12	3
SSUP 3140ZX	●	**14.0**	26.0	28.5	110	16	1
3150ZX	●	**15.0**	26.0	28.5	110	16	1
3160ZX	●	**16.0**	32.0	—	115	16	2

Grade: ACZ50M

SSUP 3000ZX type



Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Side Milling and Groove Milling

Work Material / Cutting Conditions		Carbon Steel, Cast Iron (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel (*)		Heat-Resistant Alloy Titanium Alloy (20 to 45HRC)	
DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0		9,000	540	6,000	320	4,000	240	5,500	240	2,600	90
4.0		6,600	600	4,500	340	3,000	280	4,000	240	2,000	90
6.0		4,800	720	3,000	360	2,500	280	3,000	360	1,200	90
8.0		3,600	750	2,200	460	2,000	300	2,000	390	1,000	100
10.0		2,800	750	1,800	460	1,500	300	1,700	410	800	120
12.0		2,400	710	1,500	410	1,200	280	1,500	380	700	100
14.0		2,200	660	1,300	370	1,000	270	1,200	320	600	95
16.0		1,800	490	1,100	320	800	230	1,000	270	500	90
Side Milling	ap	1.5DC									
	ae	0.1DC				0.05DC		0.1DC		0.05DC	
Groove Milling	ap	1.0DC				0.2DC		0.3DC		0.2DC	

1. For groove milling of stainless steel, use 60% of the recommended spindle speed and 40% of the recommended feed rate. (*)
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

Drilling

Work Material / Cutting Conditions	Carbon Steel, Cast Iron (150 to 250HB)		Alloy Steel SCM (25 to 35HRC)		Tempered Steel / Hardened Steel NAK, HPM (40 to 50HRC)		Stainless Steel		Heat-Resistant Alloy Titanium Alloy (20 to 45HRC)	
DC (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Spindle Speed (min^{-1})	Feed Rate (mm/min)
2.0	9,000	150	6,000	100	4,000	60	6,400	25	2,600	20
4.0	6,600	250	4,500	170	3,000	80	3,600	30	2,000	40
6.0	4,800	300	3,000	200	2,500	110	2,650	40	1,200	40
8.0	3,600	300	2,200	200	2,000	120	2,000	40	1,000	50
10.0	2,800	300	1,800	200	1,500	120	1,600	40	800	50
12.0	2,400	300	1,500	200	1,200	120	1,300	40	700	50
14.0	2,200	250	1,300	150	1,000	80	1,150	35	600	40
16.0	1,800	200	1,100	120	800	60	1,000	35	500	30

1. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.
2. Supply water-soluble coolant when machining stainless steel, heat-resistant alloy and titanium alloy. Use dry machining (air blow) for all other work materials.

Drills J

J1 to J170

Drill Selection Guide J2-1
Effective Length List by Diameter J3-1
Application Range of Major Drills J4
Drill Coating J6

Solid Carbide Drills	General-purpose	MULTIDRILL NeXEO MDE series J8
	For Flat Bottom Hole	Flat MULTIDRILL MDF series J26
	For High Efficiency	Super MULTIDRILL GS series / HGS series ... J38
	For Thin Plates	Super MULTIDRILL WGS series J50
	For Stainless Steel	MULTIDRILL MDM series J52
	For Cast Iron	Strong MULTIDRILL HX series J62
	For High-efficiency Steel and Cast Iron	Strong MULTIDRILL HY series J70
	For Hardened Steel	Super MULTIDRILL D series J72
	For Heat-Resistant Alloy	SGS series J74
	For High-efficiency, Deep Hole	Super MULTIDRILL XHGS series / PHT series ... J76
	New For Non-Ferrous Metals	MULTIDRILL MDA series J84
	For Non-Ferrous Metals	Super MULTIDRILL NHGS series J92
	For CFRP	SUMIDIA Coat Drills SDC series J97
	For Aluminum Alloy	SUMIDIA Drills DAL series / DDL series J98
	For Small Diameter Deep Hole	Micro Long Drill MLDH-L type / MLDH-P type ... J99
	For Very Small Hole	Micro MULTIDRILL MDUS series / MDUP series / MINI-MULTIDRILL MDSS series J102
Indexable Head type Drills	Indexable Head type Drills	SEC-MULTIDRILL SMD series J104
		Heads for General Steel / Cast Iron / Exotic Alloys: MTL type / MSL type / MEL type ... J105
		Heads for Flat Bottom Hole: MFS type J118
		Heads for Rolled Steel for Welded Structures (for Bridge): MB type ... J126
Indexable Insert type Drills	General-purpose	SumiDrill WDX series J128
	For Deep Drilling / Pocketing	SEC-Plunge Drill PDL series / SEC-Plunge Mill PCT series ... J142
	For Medium to Large Sized Hole	SEC-COREMILL TCS series J148
Solid Reamers	For High-efficiency, High-precision Reaming	SumiReamer SSR series J150
Indexable Insert type Reamers	For High-efficiency Reaming	SumiReamer SR series J160
Others	Uncoated Solid Carbide Drill	SD series J170

Stock Markings and Symbols

● ● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

Drill Selection Guide

Applications	Work Material	Series	Cat. No.	Diameter (mm)	Appearance	Ref. Page
General-purpose	P M K S	MULTIDRILL NeXEO **MDE-E** type	MDE○○○○S○○E02	ø1.0 to ø20.0		J8
			MDE○○○○S○○E04	ø1.0 to ø20.0		
	P M K N S	MULTIDRILL NeXEO **MDE-H** type	MDE○○○○S○○H03	ø1.0 to ø20.0		J8
			MDE○○○○S○○H05	ø1.0 to ø20.0		
			MDE○○○○S○○H08	ø1.0 to ø16.0		
High Efficiency	P K	Super MULTIDRILL **GS** series	MDW○○○○GS2	ø1.0 to 20.0		J38
			MDW○○○○GS4	ø1.0 to 20.0		
	P M K S	Super MULTIDRILL **HGS** series	MDW○○○○HGS3	ø1.5 to 20.0		J38
			MDW○○○○HGS5	ø1.5 to 20.0		
			MDW○○○○HGS8	ø1.5 to 16.0		
	P K	Strong MULTIDRILL **HY** series	MDW○○○○HY3	ø5.0 to 16.0		J70
			MDW○○○○HY5	ø5.0 to 16.0		
			MDW○○○○HY8	ø5.0 to 16.0		
Flat Bottom Hole	P M K N	Flat MULTIDRILL **MDF** series	MDF○○○○S2D	ø0.3 to 20.0		J26
			MDF○○○○L2D	ø3.0 to 20.0		
			MDF○○○○H3D	ø3.0 to 16.0		
			MDF○○○○H5D	ø3.0 to 16.0		
Deep Hole	P M K	Super MULTIDRILL **XHGS** series	MDW○○○○XHGS10	ø2.1 to 16.0		J76
			MDW○○○○XHGS12	ø2.5 to 16.0		
			MDW○○○○XHGS15	ø2.1 to 16.0		
			MDW○○○○XHGS20	ø2.1 to 14.0		
			MDW○○○○XHGS25	ø2.1 to 12.0		
			MDW○○○○XHGS30	ø2.1 to 10.0		
		Guide Drill for Long Drills **PHT** series	MDW○○○○PHT	ø2.1 to 16.0		J76
Thin Plates	P M K S	MULTIDRILL NeXEO **MDE-E** type for Hub Drilling	MDE○○○○S○○E02H	ø8.8 to ø13.97		J8
	P	Super MULTIDRILL **WGS** series	MDW○○○○WGS2	ø6.8 to 16.0		J50
Stainless Steel	M S	MULTIDRILL **MDM** series	MDM○○○○S○○H03	ø3.0 to ø16.0		J52
			MDM○○○○S○○H05	ø3.0 to ø16.0		
Cast Iron	K	Strong MULTIDRILL **HX** series	MDW○○○○HX3	ø3.0 to 20.0		J62
			MDW○○○○HX5	ø3.0 to 20.0		
			MDW○○○○HX8	ø3.0 to 18.0		
Non-Ferrous Metals	N	MULTIDRILL **MDA** series	MDA○○○○S○○H03	ø1.0 to 12.0		J84
			MDA○○○○S○○H05	ø1.0 to 12.0		
			MDA○○○○S○○H10	ø1.0 to 12.0		
			MDA○○○○S○○H15	ø1.0 to 3.0		
			MDA○○○○S○○H20	ø1.0 to 3.0		
		Super MULTIDRILL **NHGS** series	MDW○○○○NHGS3	ø3.0 to 16.0		J92
			MDW○○○○NHGS5	ø3.0 to 16.0		
			MDW○○○○NHGS10	ø3.0 to 16.0		
		SUMIDIA Drills **DAL** series	DAL○○○○H	ø5.0 to 12.0		J98
		SUMIDIA Drills **DDL** series	DDL○○○○H	ø5.0 to 12.0		J98
Hardened Steel	S H	Super MULTIDRILL **D** series	MDS○○○MD	ø1.0 to 20.0		J72

Drill Selection Guide

Series	Drilling Depth (L/D)	Coated Carbide	Coolant Supply	P			H		M	S		K		N			Ref. Page
				Carbon Steel Alloy Steel up to 35HRC		Tempered Steel	Hardened Steel		Stainless Steel	Titanium Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite	
				C 0.28% or below	C 0.29%	SKD SKS	45HRC or less	46HRC or more	SUS	Ti	Inconel	FC	FCD	Al	Cu	CFRP	
MDE-E type	2D 4D	NX Coat	External	○	◎	◎	○		○	○	○	◎	◎				J8
MDE-H type	3D 5D 8D	NX Coat	Internal	◎	◎	◎	○		◎	○	○	◎	◎	○	○		J8
GS series	2D 4D	DEX Coat	External	○	◎	◎	○	○	○	○	○	○	◎				J38
HGS series	3D 5D 8D	DEX Coat	Internal	◎	◎	◎	○	○	◎	◎	○	○	◎		○		J38
HY series	3D 5D 8D	DEX Coat	Internal	◎	◎							◎	◎				J70
MDF series	2D 3D 5D	PVD Coat	External S2D	◎	◎	◎	○		○	○	○	○	○	○			J26
			External L2D	◎	◎	◎	○		○			○	○	○			
			Internal	◎	◎	◎	○		○			○	○	○			
XHGS series	10D 12D 15D 20D 25D 30D	DEX Coat	Internal	○	◎	◎	○		○			○	◎				J76
PHT series	Pilot 3D	DEX Coat	Internal	○	◎	◎	○		○			○	◎				J76
MDE-E type For Hub Drilling	2D	NX Coat	External	○	◎	◎	○		○	○	○	◎	◎				J8
WGS series	2D	DEX Coat	External	○	◎	◎	○		○			○	○				J50
MDM series	3D 5D	NX Coat	Internal	○	○				◎	◎	○	○	○				J52
HX series	3D 5D 8D	DEX Coat	Internal									◎	◎				J62
MDA series	3D 5D 10D 15D 20D	AURORA Coat DLC	Internal											◎	◎		J84
NHGS series	3D 5D 10D	AURORA Coat DLC	Internal											◎	◎		J92
DAL series	3D	–	External											◎		○	J98
DDL series	3D	–	External											◎		○	J98
D series	3D	ZX Coat	External				◎	◎		◎							J72

Drill Selection Guide

Applications/ Specifications	Work Material	Series	Cat. No.	Diameter (mm)	Appearance	Ref. Page
Heat-Resistant Alloy	S	Drill for Heat-Resistant Alloys **SGS** series	MDW○○○○SGS3	ø3.0 to 12.0		J74
CFRP	CFRP	SUMIDIA Coat Drills **SDC** series	MDS○○○○○SDC3	ø2.0 to 10.0		J97
Small Diameter Deep Hole	P M K	Micro Long Drill **MLDH** series	MLDH○○○○L5	ø0.8 to 2.0		J99
			MLDH○○○○L12	ø0.8 to 2.0		
			MLDH○○○○L20	ø0.8 to 2.0		
			MLDH○○○○L30	ø0.8 to 2.0		
		Guide Drill for MLDH series **MLDH-P** type	MLDH○○○○P	ø0.8 to 2.0		J99
Very Small Diameter	P M K H	MINI-MULTIDRILL **MDSS** series	MDSS○○○○	ø0.2 to 1.0		J102
	P M N	Micro MULTIDRILL **MDUS** series	MDUS○○○○-30C	ø0.03 to 0.19		J102
		Micro Multi Pointing Drill **MDUP** series	MDUP○○○○-30C	ø0.03 to 0.18		J102
Indexable Head type Emphasis on Edge Sharpness	P M K	SEC-MULTIDRILL **SMD-MSL** type Head	SMDH○○○-1.5D/-1.5DF	ø12.0 to 30.8 D: ø13.5 to 30.8		J104
			SMDH○○○M/-3D/-3DF			
			SMDH○○○L/-5D/-5DF			
			SMDH○○○D/-8D/-8DF			
			SMDH○○○-12D			
Indexable Head type High-efficiency	P K	SEC-MULTIDRILL **SMD-MTL** type Head	SMDH○○○-1.5D/-1.5DF	ø12.0 to 30.8 M, L: ø12.0 to 42.5 D: ø13.5 to 30.8		J104
			SMDH○○○M/-3D/-3DF			
			SMDH○○○L/-5D/-5DF			
			SMDH○○○D/-8D/-8DF			
			SMDH○○○-12D			
Indexable Head type Low Resistance	P M K	SEC-MULTIDRILL **SMD-MEL** type Head	SMDH○○○-1.5D/-1.5DF	ø12.0 to 30.8 D: ø13.5 to 30.8		J104
			SMDH○○○M/-3D/-3DF			
			SMDH○○○L/-5D/-5DF			
			SMDH○○○D/-8D/-8DF			
			SMDH○○○-12D			
Indexable Head type For Flat Bottom Hole	P M K N	SEC-MULTIDRILL **SMD-MFS** type Head	SMDH○○○-1.5D/1.5DF/S	ø12.0 to 30.0		J118
Indexable Head type For Bridge	P	SEC-MULTIDRILL **SMD-MB** type Head	SMDH○○○B3	ø24.5 to 26.7		J126
Indexable Insert type	P M K N	SumiDrill **WDX** series	WDX○○○D2S○○	ø13.0 to 68.0		J128
			WDX○○○D3S○○	ø13.0 to 68.0		
			WDX○○○D4S○○	ø13.0 to 63.0		
			WDX○○○D5S○○	ø13.0 to 55.0		
	P K S N	SEC-Plunge Drill **PDL** series	PDL○○○D2S○○	ø16.0 to 40.0		J142
			PDL○○○D3S○○	ø16.0 to 40.0		
	P K S N	SEC-Plunge Mill **PCT** series	PCT○○○D3S○○	ø16.0 to 40.0		J142
			PCT○○○D5S○○	ø16.0 to 40.0		
Solid Reamer	P K	SumiReamer **SSR** series	SSR○○○H7T	ø2.97 to 12.0		J150
			SSR○○○H7S			
			SSR○○○JT			
			SSR○○○JS			
Indexable Insert type Reamer	P M K N	SumiReamer **SR** series	SRG○○.○H7-○○○-○○○12R1	ø11.9 to 140.6		J160
			SRL○○.○H7-○○○-○○○12R1	ø11.9 to 140.6		

Drill Selection Guide

Series	Drilling Depth (L/D)	Coated Carbide	Coolant Supply	P			H		M	S		K		N			Ref. Page
				Carbon Steel Alloy Steel up to 35HRC		Tempered Steel	Hardened Steel		Stainless Steel	Titanium Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy	Copper Alloy	Composite	
				C 0.28% or below	C 0.29%	SKD SKS	45HRC or less	46HRC or more	SUS	Ti	Inconel	FC	FCD	Al	Cu	CFRP	
SGS series	3D	PVD Coat	External						○	○	◎						J74
SDC series	3D	SUMIDIA Coat	Dry											○		◎	J97
MLDH series	5D 12D 20D 30D	PVD Coat	Internal	◎	◎	○	○		◎	○	○	◎	◎	○			J99
MLDH-P series	Pilot 2D	PVD Coat	Internal	◎	◎	○	○		◎	○	○	◎	◎	○			J99
MDSS series	10D	FB Coat	External	◎	◎	◎	◎	○	◎		○	◎	◎	○			J102
MDUS series	10D	PVD Coat	External	◎	◎				◎					○	◎		J102
MDUP series	Pilot 1D	PVD Coat	External	◎	◎				◎					○	◎		J102
SMD -MSL type Head	1.5D 3D 5D 8D 12D	NX Coat		◎	○				◎	○	○	◎	◎				J104
SMD -MTL type Head	1.5D 3D 5D 8D 12D	DEX Coat	Internal	◎	◎	○	○					◎	◎				J104
SMD -MEL type Head	1.5D 3D 5D 8D 12D	DEX Coat	Internal	◎	○		○		◎	○	○	◎	◎	○			J104
SMD -MFS type Head	1.5D 3D 5D 8D 12D	DEX Coat	Internal	◎	◎		○		○			○	○	○			J118
SMD -MB type Head	3D	DEX Coat	Internal	◎	◎												J126
WDX series	2D 3D 4D 5D	PVD Coat / AURORA Coat DLC / CVD Coat	Internal	◎	◎		○		◎			◎	◎	◎			J128
PDL series	2D 3D	PVD Coat / AURORA Coat DLC / CVD Coat	Internal	◎	◎		○		○	◎		◎	◎	◎	○		J142
PCT series	3D 5D	PVD Coat / AURORA Coat DLC / CVD Coat	Internal	◎	◎		○		○	◎		◎	◎	◎	○		J142
SSR series		PVD Coat	Internal	◎	◎	◎	○					◎	◎				J150
SR series		PVD Coat / AURORA Coat DLC	Internal	◎	◎	◎	○		◎			◎	◎	○	○		J160

Effective Length List by Diameter

● Diameter ø0.03 to ø0.78mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
0.03	0.02	38.2	MDUP 0030-30C	J102
	0.26	38.0	MDUS 0030-30C	J103
0.04	0.04	38.2	MDUP 0040-30C	J102
	0.34	38.0	MDUS 0040-30C	J103
0.05	0.05	38.2	MDUP 0050-30C	J102
	0.45	38.0	MDUS 0050-30C	J103
0.08	0.06	38.2	MDUP 0080-30C	J102
	0.72	38.0	MDUS 0080-30C	J103
0.1	0.1	38.2	MDUP 0100-30C	J102
	0.9	38.0	MDUS 0100-30C	J103
0.12	0.08	38.2	MDUP 0120-30C	J102
	1.08	38.0	MDUS 0120-30C	J103
0.15	0.08	38.2	MDUP 0150-30C	J102
	1.35	38.0	MDUS 0150-30C	J103
0.18	0.17	38.2	MDUP 0180-30C	J102
	1.62	38.0	MDUS 0180-30C	J103
0.2	2.25	38.0	MDSS 0020	J103
0.21	2.24	38.0	MDSS 0021	J103
0.22	2.23	38.0	MDSS 0022	J103
0.23	2.21	38.0	MDSS 0023	J103
0.24	2.2	38.0	MDSS 0024	J103
0.25	2.19	38.0	MDSS 0025	J103
0.26	2.18	38.0	MDSS 0026	J103
0.27	2.16	38.0	MDSS 0027	J103
0.28	2.15	38.0	MDSS 0028	J103
0.29	2.14	38.0	MDSS 0029	J103
0.3	0.9	40.0	MDF 0030S2D	J28
	2.6	38.0	MDSS 0030	J103
0.31	2.6	38.0	MDSS 0031	J103
0.32	2.6	38.0	MDSS 0032	J103
0.33	2.6	38.0	MDSS 0033	J103
0.34	2.6	38.0	MDSS 0034	J103
0.35	3.6	38.0	MDSS 0035	J103
0.36	3.6	38.0	MDSS 0036	J103
0.37	3.5	38.0	MDSS 0037	J103
0.38	3.5	38.0	MDSS 0038	J103
0.39	3.5	38.0	MDSS 0039	J103
0.4	1.2	40.0	MDF 0040S2D	J28
	4.5	38.0	MDSS 0040	J103
0.41	4.5	38.0	MDSS 0041	J103
0.42	4.5	38.0	MDSS 0042	J103
0.43	4.5	38.0	MDSS 0043	J103
0.44	4.5	38.0	MDSS 0044	J103
0.45	4.4	38.0	MDSS 0045	J103
0.46	4.4	38.0	MDSS 0046	J103
0.47	4.4	38.0	MDSS 0047	J103
0.48	4.4	38.0	MDSS 0048	J103
0.49	4.4	38.0	MDSS 0049	J103
0.5	1.5	40.0	MDF 0050S2D	J28
	5.4	38.0	MDSS 0050	J103
0.51	5.4	38.0	MDSS 0051	J103
0.52	5.4	38.0	MDSS 0052	J103
0.53	5.3	38.0	MDSS 0053	J103
0.54	5.3	38.0	MDSS 0054	J103
0.55	5.3	38.0	MDSS 0055	J103
0.56	5.3	38.0	MDSS 0056	J103
0.57	5.3	38.0	MDSS 0057	J103
0.58	5.3	38.0	MDSS 0058	J103
0.59	5.3	38.0	MDSS 0059	J103
0.6	1.8	40.0	MDF 0060S2D	J28
	6.3	38.0	MDSS 0060	J103
0.61	6.2	38.0	MDSS 0061	J103
0.62	6.2	38.0	MDSS 0062	J103
0.63	6.2	38.0	MDSS 0063	J103
0.64	6.2	38.0	MDSS 0064	J103
0.65	6.2	38.0	MDSS 0065	J103
0.66	6.2	38.0	MDSS 0066	J103
0.67	6.2	38.0	MDSS 0067	J103
0.68	6.2	38.0	MDSS 0068	J103
0.69	6.1	38.0	MDSS 0069	J103
0.7	2.1	40.0	MDF 0070S2D	J28
	8.1	38.0	MDSS 0070	J103
0.71	8.1	38.0	MDSS 0071	J103
0.72	8.1	38.0	MDSS 0072	J103
0.73	8.1	38.0	MDSS 0073	J103
0.74	8.1	38.0	MDSS 0074	J103
0.75	8.1	38.0	MDSS 0075	J103
0.76	8.1	38.0	MDSS 0076	J103
0.77	8.0	38.0	MDSS 0077	J103
0.78	8.0	38.0	MDSS 0078	J103

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø0.79 to ø0.92mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
0.79	8.0	38.0	MDSS 0079	J103
0.8	2.0	45.0	MLDH 0800P	J100
	2.4	40.0	MDF 0080S2D	J28
	6.8	50.0	MLDH 0800L5	J100
	9.0	38.0	MDSS 0080	J103
	12.8	55.0	MLDH 0800L12	J100
	17.8	60.0	MLDH 0800L20	J100
	26.8	70.0	MLDH 0800L30	J100
0.81	2.0	45.0	MLDH 0810P	J100
	7.8	50.0	MLDH 0810L5	J100
	9.0	38.0	MDSS 0081	J103
	12.8	55.0	MLDH 0810L12	J100
	17.8	60.0	MLDH 0810L20	J100
	26.8	70.0	MLDH 0810L30	J100
0.82	2.1	45.0	MLDH 0820P	J100
	7.8	50.0	MLDH 0820L5	J100
	9.0	38.0	MDSS 0082	J103
	12.8	55.0	MLDH 0820L12	J100
	18.8	60.0	MLDH 0820L20	J100
	26.8	70.0	MLDH 0820L30	J100
0.83	2.1	45.0	MLDH 0830P	J100
	7.8	50.0	MLDH 0830L5	J100
	9.0	38.0	MDSS 0083	J103
	12.8	55.0	MLDH 0830L12	J100
	18.8	60.0	MLDH 0830L20	J100
	26.8	70.0	MLDH 0830L30	J100
0.84	2.1	45.0	MLDH 0840P	J100
	7.7	50.0	MLDH 0840L5	J100
	9.0	38.0	MDSS 0084	J103
	12.7	55.0	MLDH 0840L12	J100
	18.7	60.0	MLDH 0840L20	J100
	27.7	70.0	MLDH 0840L30	J100
0.85	2.1	45.0	MLDH 0850P	J100
	7.7	50.0	MLDH 0850L5	J100
	8.9	38.0	MDSS 0085	J103
	12.7	55.0	MLDH 0850L12	J100
	18.7	60.0	MLDH 0850L20	J100
	27.7	70.0	MLDH 0850L30	J100
0.86	2.1	45.0	MLDH 0860P	J100
	7.7	50.0	MLDH 0860L5	J100
	8.9	38.0	MDSS 0086	J103
	13.7	55.0	MLDH 0860L12	J100
	19.7	65.0	MLDH 0860L20	J100
	27.7	70.0	MLDH 0860L30	J100
0.87	2.2	45.0	MLDH 0870P	J100
	7.7	50.0	MLDH 0870L5	J100
	8.9	38.0	MDSS 0087	J103
	13.7	55.0	MLDH 0870L12	J100
	19.7	65.0	MLDH 0870L20	J100
	28.7	70.0	MLDH 0870L30	J100
0.88	2.2	45.0	MLDH 0880P	J100
	7.7	50.0	MLDH 0880L5	J100
	8.9	38.0	MDSS 0088	J103
	13.7	55.0	MLDH 0880L12	J100
	19.7	65.0	MLDH 0880L20	J100
	28.7	70.0	MLDH 0880L30	J100
0.89	2.3	45.0	MLDH 0890P	J100
	7.7	50.0	MLDH 0890L5	J100
	8.9	38.0	MDSS 0089	J103
	13.7	55.0	MLDH 0890L12	J100
	19.7	65.0	MLDH 0890L20	J100
	28.7	70.0	MLDH 0890L30	J100
0.9	2.3	45.0	MLDH 0900P	J100
	2.7	40.0	MDF 0090S2D	J28
	7.7	50.0	MLDH 0900L5	J100
	9.9	38.0	MDSS 0090	J103
	13.7	55.0	MLDH 0900L12	J100
	20.7	65.0	MLDH 0900L20	J100
	29.7	75.0	MLDH 0900L30	J100
0.91	2.2	45.0	MLDH 0910P	J100
	8.6	50.0	MLDH 0910L5	J100
	9.9	38.0	MDSS 0091	J103
	13.6	55.0	MLDH 0910L12	J100
	20.6	65.0	MLDH 0910L20	J100
	29.6	75.0	MLDH 0910L30	J100
0.92	2.3	45.0	MLDH 0920P	J100
	8.6	50.0	MLDH 0920L5	J100
	9.9	38.0	MDSS 0092	J103
	14.6	60.0	MLDH 0920L12	J100
	20.6	65.0	MLDH 0920L20	J100

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø0.92 to ø1.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
0.92	29.6	75.0	MLDH 0920L30	J100
0.93	2.3	45.0	MLDH 0930P	J100
	8.6	50.0	MLDH 0930L5	J100
	9.8	38.0	MDSS 0093	J103
	14.6	60.0	MLDH 0930L12	J100
	20.6	65.0	MLDH 0930L20	J100
	30.6	75.0	MLDH 0930L30	J100
0.94	2.4	45.0	MLDH 0940P	J100
	8.6	50.0	MLDH 0940L5	J100
	9.8	38.0	MDSS 0094	J103
	14.6	60.0	MLDH 0940L12	J100
	21.6	65.0	MLDH 0940L20	J100
	30.6	75.0	MLDH 0940L30	J100
0.95	2.4	45.0	MLDH 0950P	J100
	8.6	50.0	MLDH 0950L5	J100
	9.8	38.0	MDSS 0095	J103
	14.6	60.0	MLDH 0950L12	J100
	21.6	65.0	MLDH 0950L20	J100
	30.6	75.0	MLDH 0950L30	J100
0.96	2.4	45.0	MLDH 0960P	J100
	8.6	50.0	MLDH 0960L5	J100
	9.8	38.0	MDSS 0096	J103
	14.6	60.0	MLDH 0960L12	J100
	21.6	65.0	MLDH 0960L20	J100
	31.6	75.0	MLDH 0960L30	J100
0.97	2.4	45.0	MLDH 0970P	J100
	8.5	50.0	MLDH 0970L5	J100
	9.8	38.0	MDSS 0097	J103
	14.5	60.0	MLDH 0970L12	J100
	21.5	65.0	MLDH 0970L20	J100
	31.5	75.0	MLDH 0970L30	J100
0.98	2.4	45.0	MLDH 0980P	J100
	8.5	50.0	MLDH 0980L5	J100
	9.8	38.0	MDSS 0098	J103
	15.5	60.0	MLDH 0980L12	J100
	22.5	65.0	MLDH 0980L20	J100
	31.5	75.0	MLDH 0980L30	J100
0.99	2.5	45.0	MLDH 0990P	J100
	8.5	50.0	MLDH 0990L5	J100
	9.8	38.0	MDSS 0099	J103
	15.5	60.0	MLDH 0990L12	J100
	22.5	65.0	MLDH 0990L20	J100
	32.5	75.0	MLDH 0990L30	J100
1.0	2.5	45.0	MLDH 1000P	J100
	3.0	45.0	MDF 0100S2D	J28
	4.5	45.0	MDA 0100S03H03	J86
	4.7	45.2	MDW 0100GS2	J40
	5.7	45.2	MDE 0100S03E02	J13
	6.7	57.2	MDE 0100S03H03	J19
	7.7	49.2	MDE 0100S03E04	J13
	8.5	50.0	MDA 0100S03H05	J86
	8.5	50.0	MLDH 1000L5	J100
	8.7	59.2	MDE 0100S03H05	J19
	10.7	49.2	MDW 0100GS4	J40
	10.8	38.0	MDSS 0100	J103
	11.7	62.2	MDE 0100S03H08	J19
	12.5	55.0	MDA 0100S03H10	J86
	15.5	60.0	MLDH 1000L12	J100
	17.5	60.0	MDA 0100S03H15	J86
	22.5	65.0	MDA 0100S03H20	J86
	22.5	65.0	MLDH 1000L20	J100
	32.5	75.0	MLDH 1000L30	J100
1.05	2.6	45.0	MLDH 1050P	J100
	10.4	55.0	MLDH 1050L5	J100
	16.4	60.0	MLDH 1050L12	J100
	23.4	65.0	MLDH 1050L20	J100
	34.4	80.0	MLDH 1050L30	J100
1.1	2.8	45.0	MLDH 1100P	J101
	3.3	45.0	MDF 0110S2D	J28
	4.6	45.2	MDW 0110GS2	J40
	5.6	45.2	MDE 0110S03E02	J13
	6.4	45.0	MDA 0110S03H03	J86
	6.6	57.2	MDE 0110S03H03	J19
	7.6	49.2	MDE 0110S03E04	J13
	8.6	59.2	MDE 0110S03H05	J19
	10.4	50.0	MDA 0110S03H05	J86
	10.4	55.0	MLDH 1100L5	J101
	10.6	49.2	MDW 0110GS4	J40
	12.6	62.2	MDE 0110S03H08	J19
	16.4	55.0	MDA 0110S03H10	J86

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø1.1 to ø1.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
1.1	17.4	60.0	MLDH 1100L12	J101
	19.4	65.0	MDA 0110S03H15	J86
	24.4	70.0	MDA 0110S03H20	J86
	24.4	70.0	MLDH 1100L20	J101
	35.4	80.0	MLDH 1100L30	J101
1.15	2.9	45.0	MLDH 1150P	J101
	10.3	55.0	MLDH 1150L5	J101
	18.3	60.0	MLDH 1150L12	J101
	26.3	70.0	MLDH 1150L20	J101
	37.3	80.0	MLDH 1150L30	J101
1.2	3.0	45.0	MLDH 1200P	J101
	3.6	45.0	MDF 0120S2D	J28
	4.4	45.2	MDW 0120GS2	J40
	6.2	48.0	MDA 0120S03H03	J86
	6.4	45.2	MDE 0120S03E02	J13
	7.4	57.2	MDE 0120S03H03	J19
	8.4	49.2	MDE 0120S03E04	J13
	9.4	59.2	MDE 0120S03H05	J19
	10.2	55.0	MDA 0120S03H05	J86
	10.2	55.0	MLDH 1200L5	J101
	10.4	49.2	MDW 0120GS4	J40
	13.4	62.2	MDE 0120S03H08	J19
	16.2	60.0	MDA 0120S03H10	J86
	18.2	60.0	MLDH 1200L12	J101
	21.2	65.0	MDA 0120S03H15	J86
	27.2	70.0	MDA 0120S03H20	J86
	27.2	70.0	MLDH 1200L20	J101
	39.2	85.0	MLDH 1200L30	J101
1.25	3.1	45.0	MLDH 1250P	J101
	12.1	55.0	MLDH 1250L5	J101
	19.1	65.0	MLDH 1250L12	J101
	28.1	70.0	MLDH 1250L20	J101
	41.1	85.0	MLDH 1250L30	J101
1.3	3.3	45.0	MLDH 1300P	J101
	3.9	45.0	MDF 0130S2D	J28
	4.4	45.3	MDW 0130GS2	J40
	6.1	48.0	MDA 0130S03H03	J86
	6.3	45.2	MDE 0130S03E02	J13
	7.3	57.2	MDE 0130S03H03	J19
	9.3	49.2	MDE 0130S03E04	J13
	10.3	59.2	MDE 0130S03H05	J19
	10.4	49.3	MDW 0130GS4	J40
	12.1	55.0	MDA 0130S03H05	J86
	12.1	55.0	MLDH 1300L5	J101
	14.3	62.2	MDE 0130S03H08	J19
	18.1	60.0	MDA 0130S03H10	J86
	20.1	65.0	MLDH 1300L12	J101
	23.1	65.0	MDA 0130S03H15	J86
	29.1	75.0	MDA 0130S03H20	J86
	29.1	75.0	MLDH 1300L20	J101
	42.1	85.0	MLDH 1300L30	J101
1.35	3.4	45.0	MLDH 1350P	J101
	12.0	55.0	MLDH 1350L5	J101
	21.0	65.0	MLDH 1350L12	J101
	30.0	75.0	MLDH 1350L20	J101
	44.0	90.0	MLDH 1350L30	J101
1.4	3.5	45.0	MLDH 1400P	J101
	4.2	45.0	MDF 0140S2D	J28
	4.2	45.3	MDW 0140GS2	J40
	5.9	48.0	MDA 0140S03H03	J86
	7.2	45.3	MDE 0140S03E02	J13
	8.2	57.3	MDE 0140S03H03	J19
	9.2	49.3	MDE 0140S03E04	J13
	10.2	49.3	MDW 0140GS4	J40
	11.2	59.3	MDE 0140S03H05	J19
	11.9	55.0	MDA 0140S03H05	J86
	11.9	55.0	MLDH 1400L5	J101
	15.2	62.3	MDE 0140S03H08	J19
	17.9	60.0	MDA 0140S03H10	J86
	21.9	65.0	MLDH 1400L12	J101
	25.9	70.0	MDA 0140S03H15	J86
	31.9	75.0	MDA 0140S03H20	J86
	31.9	75.0	MLDH 1400L20	J101
	45.9	90.0	MLDH 1400L30	J101
1.45	3.6	45.0	MLDH 1450P	J101
	13.8	55.0	MLDH 1450L5	J101
	22.8	65.0	MLDH 1450L12	J101
	32.8	75.0	MLDH 1450L20	J101
	46.8	90.0	MLDH 1450L30	J101
1.5	3.8	45.0	MLDH 1500P	J101

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø1.5 to ø1.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
1.5	4.1	45.3	MDW 0150GS2	J40
	4.5	45.0	MDF 0150S2D	J28
	5.8	48.0	MDA 0150S03H03	J86
	7.1	45.3	MDE 0150S03E02	J13
	8.1	63.3	MDW 0150HGS3	J44
	9.1	57.3	MDE 0150S03H03	J19
	10.1	49.3	MDE 0150S03E04	J13
	10.1	49.3	MDW 0150GS4	J40
	12.1	59.3	MDE 0150S03H05	J19
	12.1	70.3	MDW 0150HGS5	J44
	13.8	55.0	MDA 0150S03H05	J86
	13.8	55.0	MLDH 1500L5	J101
	16.1	62.3	MDE 0150S03H08	J19
	16.6	76.3	MDW 0150HGS8	J44
	20.8	65.0	MDA 0150S03H10	J86
	23.8	65.0	MLDH 1500L12	J101
	25.8	70.0	MDA 0150S03H15	J86
	33.8	75.0	MDA 0150S03H20	J86
	33.8	75.0	MLDH 1500L20	J101
	48.8	90.0	MLDH 1500L30	J101
1.55	3.9	45.0	MLDH 1550P	J101
	13.7	55.0	MLDH 1550L5	J101
	23.7	65.0	MLDH 1550L12	J101
	34.7	80.0	MLDH 1550L20	J101
	50.7	95.0	MLDH 1550L30	J101
1.6	4.0	45.0	MLDH 1600P	J101
	4.8	45.0	MDF 0160S2D	J28
	5.9	45.3	MDW 0160GS2	J40
	7.6	50.0	MDA 0160S03H03	J86
	7.9	45.3	MDE 0160S03E02	J13
	8.9	59.3	MDE 0160S03H03	J19
	10.4	63.3	MDW 0160HGS3	J44
	10.9	49.3	MDE 0160S03E04	J13
	11.9	62.3	MDE 0160S03H05	J19
	12.9	49.3	MDW 0160GS4	J40
	13.6	55.0	MDA 0160S03H05	J86
	13.6	55.0	MLDH 1600L5	J101
	16.9	67.3	MDE 0160S03H08	J19
	16.9	70.3	MDW 0160HGS5	J44
	21.9	76.3	MDW 0160HGS8	J44
	22.6	65.0	MDA 0160S03H10	J86
	24.6	70.0	MLDH 1600L12	J101
	29.6	75.0	MDA 0160S03H15	J86
	35.6	80.0	MDA 0160S03H20	J86
	35.6	80.0	MLDH 1600L20	J101
	51.6	95.0	MLDH 1600L30	J101
1.65	4.1	50.0	MLDH 1650P	J101
	15.5	60.0	MLDH 1650L5	J101
	25.5	70.0	MLDH 1650L12	J101
	37.5	80.0	MLDH 1650L20	J101
	53.5	95.0	MLDH 1650L30	J101
1.7	4.3	50.0	MLDH 1700P	J101
	5.1	45.0	MDF 0170S2D	J28
	5.9	45.4	MDW 0170GS2	J40
	7.5	50.0	MDA 0170S03H03	J86
	7.8	45.3	MDE 0170S03E02	J13
	9.8	59.3	MDE 0170S03H03	J19
	10.4	63.4	MDW 0170HGS3	J44
	10.8	49.3	MDE 0170S03E04	J13
	12.8	62.3	MDE 0170S03H05	J19
	12.9	49.4	MDW 0170GS4	J40
	15.5	60.0	MDA 0170S03H05	J86
	15.5	60.0	MLDH 1700L5	J101
	16.9	70.4	MDW 0170HGS5	J44
	17.8	67.3	MDE 0170S03H08	J19
	21.9	76.4	MDW 0170HGS8	J44
	22.5	65.0	MDA 0170S03H10	J86
	26.5	70.0	MLDH 1700L12	J101
	29.5	75.0	MDA 0170S03H15	J86
	38.5	80.0	MDA 0170S03H20	J86
	38.5	80.0	MLDH 1700L20	J101
	55.5	100.0	MLDH 1700L30	J101
1.75	4.4	50.0	MLDH 1750P	J101
	15.4	60.0	MLDH 1750L5	J101
	27.4	70.0	MLDH 1750L12	J101
	39.4	85.0	MLDH 1750L20	J101
	57.4	100.0	MLDH 1750L30	J101
1.8	4.5	50.0	MLDH 1800P	J101
	5.4	45.0	MDF 0180S2D	J28
	5.7	45.4	MDW 0180GS2	J40

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø1.8 to ø2.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
1.8	7.3	50.0	MDA 0180S03H03	J86
	8.6	45.3	MDE 0180S03E02	J13
	9.6	59.3	MDE 0180S03H03	J19
	10.2	63.4	MDW 0180HGS3	J44
	11.6	49.3	MDE 0180S03E04	J13
	12.7	49.4	MDW 0180GS4	J40
	13.6	62.3	MDE 0180S03H05	J19
	15.3	60.0	MDA 0180S03H05	J86
	15.3	60.0	MLDH 1800L5	J101
	16.7	70.4	MDW 0180HGS5	J44
	18.6	67.3	MDE 0180S03H08	J19
	21.7	76.4	MDW 0180HGS8	J44
	25.3	70.0	MDA 0180S03H10	J86
	28.3	70.0	MLDH 1800L12	J101
	32.3	75.0	MDA 0180S03H15	J86
	40.3	85.0	MDA 0180S03H20	J86
	40.3	85.0	MLDH 1800L20	J101
	58.3	100.0	MLDH 1800L30	J101
1.85	4.6	50.0	MLDH 1850P	J101
	17.2	60.0	MLDH 1850L5	J101
	28.2	70.0	MLDH 1850L12	J101
	41.2	85.0	MLDH 1850L20	J101
	59.2	103.0	MLDH 1850L30	J101
1.9	4.8	50.0	MLDH 1900P	J101
	5.6	45.4	MDW 0190GS2	J40
	5.7	45.0	MDF 0190S2D	J28
	7.2	50.0	MDA 0190S03H03	J86
	8.5	45.3	MDE 0190S03E02	J13
	10.1	63.4	MDW 0190HGS3	J44
	10.5	59.3	MDE 0190S03H03	J19
	12.5	49.3	MDE 0190S03E04	J13
	12.6	49.4	MDW 0190GS4	J40
	14.5	62.3	MDE 0190S03H05	J19
	16.6	70.4	MDW 0190HGS5	J44
	17.2	60.0	MDA 0190S03H05	J86
	17.2	60.0	MLDH 1900L5	J101
	19.5	70.3	MDE 0190S03H08	J19
	21.6	76.4	MDW 0190HGS8	J44
	25.2	70.0	MDA 0190S03H10	J86
	29.2	75.0	MLDH 1900L12	J101
	32.2	75.0	MDA 0190S03H15	J86
	43.2	85.0	MDA 0190S03H20	J86
	43.2	85.0	MLDH 1900L20	J101
	60.2	103.0	MLDH 1900L30	J101
1.95	4.9	50.0	MLDH 1950P	J101
	17.1	60.0	MLDH 1950L5	J101
	30.1	75.0	MLDH 1950L12	J101
	44.1	85.0	MLDH 1950L20	J101
	61.1	103.0	MLDH 1950L30	J101
2.0	5.0	50.0	MLDH 2000P	J101
	5.4	45.4	MDW 0200GS2	J40
	6.0	50.0	MDF 0200S2D	J28
	7.0	50.0	MDA 0200S03H03	J86
	9.4	45.4	MDE 0200S03E02	J13
	9.9	63.4	MDW 0200HGS3	J44
	10.5	50.0	MDS 02000SDC3	J97
	11.4	59.4	MDE 0200S03H03	J19
	12.4	49.4	MDW 0200GS4	J40
	13.4	49.4	MDE 0200S03E04	J13
	15.4	62.4	MDE 0200S03H05	J19
	16.4	70.4	MDW 0200HGS5	J44
	17.0	60.0	MDA 0200S03H05	J86
	17.0	60.0	MLDH 2000L5	J101
	21.4	70.4	MDE 0200S03H08	J19
	21.4	76.4	MDW 0200HGS8	J44
	27.0	70.0	MDA 0200S03H10	J86
	31.0	75.0	MLDH 2000L12	J101
	37.0	80.0	MDA 0200S03H15	J86
	45.0	90.0	MDA 0200S03H20	J86
	45.0	90.0	MLDH 2000L20	J101
	63.0	103.0	MLDH 2000L30	J101
2.1	6.3	50.0	MDF 0210S2D	J28
	7.3	45.4	MDW 0210GS2	J40
	9.3	45.4	MDE 0210S03E02	J13
	9.9	55.0	MDA 0210S03H03	J86
	11.3	59.4	MDE 0210S03H03	J19
	12.2	68.3	MDW 0210PHT	J78
	12.3	68.4	MDW 0210HGS3	J44
	13.3	49.4	MDE 0210S03E04	J13
	14.3	49.4	MDW 0210GS4	J40

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø2.1 to ø2.489mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
2.1	15.3	62.4	MDE 0210S03H05	J19
	18.9	65.0	MDA 0210S03H05	J86
	21.3	78.4	MDW 0210HGS5	J44
	22.3	70.4	MDE 0210S03H08	J19
	24.8	81.4	MDW 0210HGS8	J44
	26.9	70.0	MDA 0210S03H10	J86
	35.3	88.4	MDW 0210XHGS10	J78
	36.9	80.0	MDA 0210S03H15	J86
	45.3	98.4	MDW 0210XHGS15	J78
	46.9	95.0	MDA 0210S03H20	J86
	58.3	111.4	MDW 0210XHGS20	J78
	70.3	123.4	MDW 0210XHGS25	J78
	83.3	136.4	MDW 0210XHGS30	J78
2.2	6.6	50.0	MDF 0220S2D	J28
	7.2	45.5	MDW 0220GS2	J40
	9.7	55.0	MDA 0220S03H03	J86
	10.1	45.4	MDE 0220S03E02	J13
	12.0	68.3	MDW 0220PHT	J78
	12.1	59.4	MDE 0220S03H03	J19
	12.2	68.5	MDW 0220HGS3	J44
	14.1	49.4	MDE 0220S03E04	J13
	14.2	49.5	MDW 0220GS4	J40
	16.1	62.4	MDE 0220S03H05	J19
	18.7	65.0	MDA 0220S03H05	J86
	21.2	78.5	MDW 0220HGS5	J44
	23.1	70.4	MDE 0220S03H08	J19
	24.7	81.5	MDW 0220HGS8	J44
	28.7	75.0	MDA 0220S03H10	J86
	35.1	88.4	MDW 0220XHGS10	J78
	38.7	85.0	MDA 0220S03H15	J86
	45.1	98.4	MDW 0220XHGS15	J78
	47.7	95.0	MDA 0220S03H20	J86
	58.1	111.4	MDW 0220XHGS20	J78
	70.1	123.4	MDW 0220XHGS25	J78
	83.1	136.4	MDW 0220XHGS30	J78
2.3	6.9	50.0	MDF 0230S2D	J28
	7.1	45.5	MDW 0230GS2	J40
	9.6	55.0	MDA 0230S03H03	J86
	10.0	45.4	MDE 0230S03E02	J13
	11.9	68.3	MDW 0230PHT	J78
	12.0	63.4	MDE 0230S03H03	J19
	12.1	68.5	MDW 0230HGS3	J44
	14.0	49.4	MDE 0230S03E04	J13
	14.1	49.5	MDW 0230GS4	J40
	17.0	68.4	MDE 0230S03H05	J19
	20.6	65.0	MDA 0230S03H05	J86
	21.1	78.5	MDW 0230HGS5	J44
	24.0	75.4	MDE 0230S03H08	J19
	24.6	81.5	MDW 0230HGS8	J44
	28.6	75.0	MDA 0230S03H10	J86
	35.0	88.4	MDW 0230XHGS10	J78
	41.6	85.0	MDA 0230S03H15	J86
	45.0	98.4	MDW 0230XHGS15	J78
	49.6	100.0	MDA 0230S03H20	J86
	58.0	111.4	MDW 0230XHGS20	J78
	70.0	123.4	MDW 0230XHGS25	J78
	83.0	136.4	MDW 0230XHGS30	J78
2.4	6.9	45.5	MDW 0240GS2	J40
	7.2	50.0	MDF 0240S2D	J28
	9.4	55.0	MDA 0240S03H03	J86
	10.8	45.4	MDE 0240S03E02	J13
	11.7	68.3	MDW 0240PHT	J78
	11.9	68.5	MDW 0240HGS3	J44
	12.8	63.4	MDE 0240S03H03	J19
	13.9	49.5	MDW 0240GS4	J40
	14.8	49.4	MDE 0240S03E04	J13
	17.8	68.4	MDE 0240S03H05	J19
	20.4	65.0	MDA 0240S03H05	J86
	20.9	78.5	MDW 0240HGS5	J44
	24.4	81.5	MDW 0240HGS8	J44
	24.8	75.4	MDE 0240S03H08	J19
	31.4	75.0	MDA 0240S03H10	J86
	34.8	88.4	MDW 0240XHGS10	J78
	41.4	85.0	MDA 0240S03H15	J86
	44.8	98.4	MDW 0240XHGS15	J78
	52.4	100.0	MDA 0240S03H20	J86
	57.8	111.4	MDW 0240XHGS20	J78
	69.8	123.4	MDW 0240XHGS25	J78
	82.8	136.4	MDW 0240XHGS30	J78
2.489	12.47	50.2	MDS 02489SDC3	J97

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø2.5 to ø2.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
2.5	6.8	45.5	MDW 0250GS2	J40
	7.5	50.0	MDF 0250S2D	J28
	9.3	55.0	MDA 0250S03H03	J86
	10.8	45.5	MDE 0250S03E02	J13
	11.6	68.3	MDW 0250PHT	J78
	11.8	68.5	MDW 0250HGS3	J44
	13.8	49.5	MDW 0250GS4	J40
	13.8	63.5	MDE 0250S03H03	J19
	14.8	49.5	MDE 0250S03E04	J13
	18.8	68.5	MDE 0250S03H05	J19
	20.8	78.5	MDW 0250HGS5	J44
	22.3	65.0	MDA 0250S03H05	J86
	24.3	81.5	MDW 0250HGS8	J44
	25.8	75.5	MDE 0250S03H08	J19
	31.3	75.0	MDA 0250S03H10	J86
	34.8	88.5	MDW 0250XHGS10	J78
	37.8	91.5	MDW 0250XHGS12	J78
	41.3	85.0	MDA 0250S03H15	J86
	44.8	98.5	MDW 0250XHGS15	J78
	56.3	105.0	MDA 0250S03H20	J86
	57.8	111.5	MDW 0250XHGS20	J78
	69.8	123.5	MDW 0250XHGS25	J78
	82.8	136.5	MDW 0250XHGS30	J78
2.6	7.8	50.0	MDF 0260S2D	J28
	9.6	45.5	MDW 0260GS2	J40
	11.1	60.0	MDA 0260S03H03	J86
	11.6	45.5	MDE 0260S03E02	J13
	13.6	63.5	MDE 0260S03H03	J19
	13.9	68.3	MDW 0260PHT	J78
	14.1	68.5	MDW 0260HGS3	J44
	15.6	49.5	MDE 0260S03E04	J13
	15.6	49.5	MDW 0260GS4	J40
	18.6	68.5	MDE 0260S03H05	J19
	22.1	70.0	MDA 0260S03H05	J86
	24.6	78.5	MDW 0260HGS5	J44
	26.6	75.5	MDE 0260S03H08	J19
	29.6	81.5	MDW 0260HGS8	J44
	34.1	80.0	MDA 0260S03H10	J86
	41.6	93.5	MDW 0260XHGS10	J78
	46.1	90.0	MDA 0260S03H15	J86
	56.6	108.5	MDW 0260XHGS15	J78
	57.1	105.0	MDA 0260S03H20	J86
	71.6	123.5	MDW 0260XHGS20	J78
	86.6	138.5	MDW 0260XHGS25	J78
	101.6	153.5	MDW 0260XHGS30	J78
2.7	8.1	50.0	MDF 0270S2D	J28
	9.6	45.6	MDW 0270GS2	J40
	11.0	60.0	MDA 0270S03H03	J86
	11.5	45.5	MDE 0270S03E02	J13
	13.9	68.4	MDW 0270PHT	J78
	14.1	68.6	MDW 0270HGS3	J44
	14.5	68.5	MDE 0270S03H03	J19
	15.5	49.5	MDE 0270S03E04	J13
	15.6	49.6	MDW 0270GS4	J40
	19.5	78.5	MDE 0270S03H05	J19
	24.0	70.0	MDA 0270S03H05	J86
	24.6	78.6	MDW 0270HGS5	J44
	27.5	81.5	MDE 0270S03H08	J19
	29.6	81.6	MDW 0270HGS8	J44
	34.0	80.0	MDA 0270S03H10	J86
	41.5	93.5	MDW 0270XHGS10	J78
	46.0	90.0	MDA 0270S03H15	J86
	56.5	108.5	MDW 0270XHGS15	J78
	59.0	105.0	MDA 0270S03H20	J86
	71.5	123.5	MDW 0270XHGS20	J78
	86.5	138.5	MDW 0270XHGS25	J78
	101.5	153.5	MDW 0270XHGS30	J78
2.76	8.3	50.0	MDF 0276S2D	J28
	11.3	45.5	MDE 0276S03E02	J13
	20.3	78.5	MDE 0276S03H05	J19
2.78	8.3	50.0	MDF 0278S2D	J28
	11.3	45.5	MDE 0278S03E02	J13
	20.3	78.5	MDE 0278S03H05	J19
2.8	8.4	50.0	MDF 0280S2D	J28
	9.4	45.6	MDW 0280GS2	J40
	10.8	60.0	MDA 0280S03H03	J86
	11.3	45.5	MDE 0280S03E02	J13
	13.7	68.4	MDW 0280PHT	J78
	13.9	68.6	MDW 0280HGS3	J44
	14.3	68.5	MDE 0280S03H03	J19

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø2.8 to ø3.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
2.8	15.3	49.5	MDE 0280S03E04	J13
	15.4	49.6	MDW 0280GS4	J40
	20.3	78.5	MDE 0280S03H05	J19
	23.8	70.0	MDA 0280S03H05	J86
	24.4	78.6	MDW 0280HGS5	J44
	28.3	81.5	MDE 0280S03H08	J19
	29.4	81.6	MDW 0280HGS8	J44
	35.8	80.0	MDA 0280S03H10	J86
	41.3	93.5	MDW 0280XHGS10	J78
	50.8	95.0	MDA 0280S03H15	J86
	56.3	108.5	MDW 0280XHGS15	J78
	60.8	110.0	MDA 0280S03H20	J86
	71.3	123.5	MDW 0280XHGS20	J78
	86.3	138.5	MDW 0280XHGS25	J78
	101.3	153.5	MDW 0280XHGS30	J78
2.9	8.7	50.0	MDF 0290S2D	J28
	9.3	45.6	MDW 0290GS2	J40
	10.7	60.0	MDA 0290S03H03	J86
	11.2	45.5	MDE 0290S03E02	J13
	13.6	68.4	MDW 0290PHT	J78
	13.8	68.6	MDW 0290HGS3	J44
	15.2	49.5	MDE 0290S03E04	J13
	15.2	68.5	MDE 0290S03H03	J19
	15.3	49.6	MDW 0290GS4	J40
	21.2	78.5	MDE 0290S03H05	J19
	24.3	78.6	MDW 0290HGS5	J44
	25.7	70.0	MDA 0290S03H05	J86
	29.2	81.5	MDE 0290S03H08	J19
	29.3	81.6	MDW 0290HGS8	J44
	35.7	80.0	MDA 0290S03H10	J86
	41.2	93.5	MDW 0290XHGS10	J78
	50.7	95.0	MDA 0290S03H15	J86
	56.2	108.5	MDW 0290XHGS15	J78
	62.7	110.0	MDA 0290S03H20	J86
	71.2	123.5	MDW 0290XHGS20	J78
	86.2	138.5	MDW 0290XHGS25	J78
	101.2	153.5	MDW 0290XHGS30	J78
3.0	9.0	45.5	MDE 0300S03E02	J13
	9.0	50.0	MDF 0300S2D	J28
	9.0	100.0	MDF 0300L2D	J32
	9.1	45.6	MDW 0300GS2	J40
	10.5	60.0	MDA 0300S03H03	J86
	12.0	68.0	MDF 0300H3D	J34
	13.4	68.4	MDW 0300PHT	J78
	13.5	68.5	MDW 0300HX3	J64
	13.6	49.6	MDW 0300SGS3	J75
	13.6	68.6	MDW 0300HGS3	J44
	13.6	68.6	MDW 0300NHGS3	J93
	14.0	68.5	MDE 0300S03H03	J19
	14.0	68.5	MDM 0300S03H03	J56
	14.5	50.5	MDS 03000SDC3	J97
	15.0	49.5	MDE 0300S03E04	J13
	15.1	49.6	MDW 0300GS4	J40
	18.0	78.0	MDF 0300H5D	J34
	24.0	78.5	MDE 0300S03H05	J19
	24.0	78.5	MDM 0300S03H05	J56
	24.0	78.5	MDW 0300HX5	J64
	24.1	78.6	MDW 0300HGS5	J44
	24.1	78.6	MDW 0300NHGS5	J93
	25.5	70.0	MDA 0300S03H05	J86
	29.0	81.5	MDE 0300S03H08	J19
	29.0	81.5	MDW 0300HX8	J64
	29.1	81.6	MDW 0300HGS8	J44
	37.5	82.0	MDA 0300S03H10	J86
	38.1	92.6	MDW 0300NHGS10	J93
	41.0	93.5	MDW 0300XHGS10	J78
	47.0	99.5	MDW 0300XHGS12	J78
	53.5	98.0	MDA 0300S03H15	J86
	56.0	108.5	MDW 0300XHGS15	J78
	64.5	110.0	MDA 0300S03H20	J86
	71.0	123.5	MDW 0300XHGS20	J78
	86.0	138.5	MDW 0300XHGS25	J78
	101.0	153.5	MDW 0300XHGS30	J78
3.1	9.3	50.0	MDF 0310S2D	J28
	9.3	100.0	MDF 0310L2D	J32
	12.4	72.0	MDF 0310H3D	J34
	15.0	54.6	MDE 0310S04E02	J13
	15.0	54.6	MDW 0310GS2	J40
	15.8	72.4	MDA 0310S04H03	J87
	15.8	72.4	MDW 0310PHT	J78

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø3.1 to ø3.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
3.1	16.0	72.6	MDE 0310S04H03	J19
	16.0	72.6	MDM 0310S04H03	J56
	16.0	72.6	MDW 0310HGS3	J44
	16.0	72.6	MDW 0310HX3	J64
	18.6	86.0	MDF 0310H5D	J34
	20.0	60.6	MDE 0310S04E04	J13
	20.0	60.6	MDW 0310GS4	J40
	27.8	86.4	MDA 0310S04H05	J87
	28.0	86.6	MDE 0310S04H05	J19
	28.0	86.6	MDM 0310S04H05	J56
	28.0	86.6	MDW 0310HGS5	J44
	28.0	86.6	MDW 0310HX5	J64
	28.0	86.6	MDW 0310NHGS5	J93
	34.5	92.6	MDE 0310S04H08	J19
	34.5	92.6	MDW 0310HGS8	J44
	44.9	106.6	MDA 0310S04H10	J87
	49.0	103.6	MDW 0310XHGS10	J78
	64.0	118.6	MDW 0310XHGS15	J78
	82.0	136.6	MDW 0310XHGS20	J78
	99.0	153.6	MDW 0310XHGS25	J78
	117.0	171.6	MDW 0310XHGS30	J78
3.2	9.6	50.0	MDF 0320S2D	J28
	9.6	100.0	MDF 0320L2D	J32
	12.8	72.0	MDF 0320H3D	J34
	14.8	54.6	MDE 0320S04E02	J13
	14.9	54.7	MDW 0320GS2	J40
	15.6	72.4	MDA 0320S04H03	J87
	15.6	72.4	MDW 0320PHT	J78
	15.8	72.6	MDE 0320S04H03	J19
	15.8	72.6	MDM 0320S04H03	J56
	15.8	72.6	MDW 0320HX3	J64
	15.9	72.7	MDW 0320HGS3	J44
	15.9	72.7	MDW 0320NHGS3	J93
	19.2	86.0	MDF 0320H5D	J34
	19.8	60.6	MDE 0320S04E04	J13
	19.9	60.7	MDW 0320GS4	J40
	27.6	86.4	MDA 0320S04H05	J87
	27.8	86.6	MDE 0320S04H05	J19
	27.8	86.6	MDM 0320S04H05	J56
	27.8	86.6	MDW 0320HX5	J64
	27.9	86.7	MDW 0320HGS5	J44
	27.9	86.7	MDW 0320NHGS5	J93
	34.3	92.6	MDE 0320S04H08	J19
	34.4	92.7	MDW 0320HGS8	J44
	44.8	106.6	MDA 0320S04H10	J87
	44.9	106.7	MDW 0320NHGS10	J93
	48.8	103.6	MDW 0320XHGS10	J78
	63.8	118.6	MDW 0320XHGS15	J78
	81.8	136.6	MDW 0320XHGS20	J78
	98.8	153.6	MDW 0320XHGS25	J78
	116.8	171.6	MDW 0320XHGS30	J78
3.3	9.9	50.0	MDF 0330S2D	J28
	9.9	100.0	MDF 0330L2D	J32
	13.2	72.0	MDF 0330H3D	J34
	14.7	54.6	MDE 0330S04E02	J13
	14.8	54.7	MDW 0330GS2	J40
	15.5	72.4	MDA 0330S04H03	J87
	15.5	72.4	MDW 0330PHT	J78
	15.7	72.6	MDE 0330S04H03	J19
	15.7	72.6	MDM 0330S04H03	J56
	15.7	72.6	MDW 0330HX3	J64
	15.8	72.7	MDW 0330HGS3	J44
	15.8	72.7	MDW 0330NHGS3	J93
	16.8	61.7	MDS 03300SDC3	J97
	19.7	60.6	MDE 0330S04E04	J13
	19.8	60.7	MDW 0330GS4	J40
	19.8	86.0	MDF 0330H5D	J34
	27.5	86.4	MDA 0330S04H05	J87
	27.7	86.6	MDE 0330S04H05	J19
	27.7	86.6	MDM 0330S04H05	J56
	27.7	86.6	MDW 0330HX5	J64
	27.8	86.7	MDW 0330HGS5	J44
	27.8	86.7	MDW 0330NHGS5	J93
	34.2	92.6	MDE 0330S04H08	J19
	34.3	92.7	MDW 0330HGS8	J44
	48.7	103.6	MDW 0330XHGS10	J78
	63.7	118.6	MDW 0330XHGS15	J78
	81.7	136.6	MDW 0330XHGS20	J78
	98.7	153.6	MDW 0330XHGS25	J78
	116.7	171.6	MDW 0330XHGS30	J78

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø3.4 to ø3.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
3.4	10.2	50.0	MDF 0340S2D	J28
	10.2	100.0	MDF 0340L2D	J32
	13.6	72.0	MDF 0340H3D	J34
	14.5	54.6	MDE 0340S04E02	J13
	14.6	54.7	MDW 0340GS2	J40
	15.4	72.5	MDW 0340PHT	J78
	15.5	72.6	MDE 0340S04H03	J19
	15.5	72.6	MDM 0340S04H03	J56
	15.5	72.6	MDW 0340HX3	J64
	15.6	72.7	MDW 0340HGS3	J44
	19.5	60.6	MDE 0340S04E04	J13
	19.6	60.7	MDW 0340GS4	J40
	20.4	86.0	MDF 0340H5D	J34
	27.4	86.5	MDA 0340S04H05	J87
	27.5	86.6	MDE 0340S04H05	J19
	27.5	86.6	MDM 0340S04H05	J56
	27.5	86.6	MDW 0340HX5	J64
	27.6	86.7	MDW 0340HGS5	J44
	27.6	86.7	MDW 0340NHGS5	J93
	34.0	92.6	MDE 0340S04H08	J19
	34.1	92.7	MDW 0340HGS8	J44
	44.5	106.6	MDA 0340S04H10	J87
	44.6	106.7	MDW 0340NHGS10	J93
	48.5	103.6	MDW 0340XHGS10	J78
	63.5	118.6	MDW 0340XHGS15	J78
	81.5	136.6	MDW 0340XHGS20	J78
	98.5	153.6	MDW 0340XHGS25	J78
	116.5	171.6	MDW 0340XHGS30	J78
3.5	10.5	50.0	MDF 0350S2D	J28
	10.5	100.0	MDF 0350L2D	J32
	14.0	72.0	MDF 0350H3D	J34
	14.4	54.6	MDE 0350S04E02	J13
	14.5	54.7	MDW 0350GS2	J40
	15.2	72.5	MDA 0350S04H03	J87
	15.3	72.5	MDW 0350PHT	J78
	15.4	72.6	MDE 0350S04H03	J19
	15.4	72.6	MDM 0350S04H03	J56
	15.4	72.6	MDW 0350HX3	J64
	15.5	60.7	MDW 0350SGS3	J75
	15.5	72.7	MDW 0350HGS3	J44
	15.5	72.7	MDW 0350NHGS3	J93
	19.4	60.6	MDE 0350S04E04	J13
	19.5	60.7	MDW 0350GS4	J40
	21.0	86.0	MDF 0350H5D	J34
	27.2	86.5	MDA 0350S04H05	J87
	27.4	86.6	MDE 0350S04H05	J19
	27.4	86.6	MDM 0350S04H05	J56
	27.4	86.6	MDW 0350HX5	J64
	27.5	86.7	MDW 0350HGS5	J44
	27.5	86.7	MDW 0350NHGS5	J93
	33.9	92.6	MDE 0350S04H08	J19
	33.9	92.6	MDW 0350HX8	J64
	34.0	92.7	MDW 0350HGS8	J44
	44.4	106.6	MDA 0350S04H10	J87
	44.5	106.7	MDW 0350NHGS10	J93
	48.4	103.6	MDW 0350XHGS10	J78
	53.4	108.6	MDW 0350XHGS12	J78
	63.4	118.6	MDW 0350XHGS15	J78
	81.4	136.6	MDW 0350XHGS20	J78
	98.4	153.6	MDW 0350XHGS25	J78
	116.4	171.6	MDW 0350XHGS30	J78
3.6	10.8	50.0	MDF 0360S2D	J28
	10.8	100.0	MDF 0360L2D	J32
	14.4	72.0	MDF 0360H3D	J34
	16.3	54.7	MDE 0360S04E02	J13
	16.3	54.7	MDW 0360GS2	J40
	17.6	72.5	MDW 0360PHT	J78
	17.8	72.7	MDE 0360S04H03	J19
	17.8	72.7	MDM 0360S04H03	J56
	17.8	72.7	MDW 0360HGS3	J44
	17.8	72.7	MDW 0360HX3	J64
	21.6	86.0	MDF 0360H5D	J34
	22.3	60.7	MDE 0360S04E04	J13
	22.3	60.7	MDW 0360GS4	J40
	31.1	86.5	MDA 0360S04H05	J87
	31.3	86.7	MDE 0360S04H05	J19
	31.3	86.7	MDM 0360S04H05	J56
	31.3	86.7	MDW 0360HGS5	J44
	31.3	86.7	MDW 0360HX5	J64
	31.3	86.7	MDW 0360NHGS5	J93

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø3.6 to ø3.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
3.6	39.3	92.7	MDE 0360S04H08	J19
	39.3	92.7	MDW 0360HGS8	J44
	51.3	106.7	MDA 0360S04H10	J87
	51.3	106.7	MDW 0360NHGS10	J93
	55.3	108.7	MDW 0360XHGS10	J78
	75.3	128.7	MDW 0360XHGS15	J78
	95.3	148.7	MDW 0360XHGS20	J78
	115.3	168.7	MDW 0360XHGS25	J78
	135.3	188.7	MDW 0360XHGS30	J78
3.65	17.4	72.5	MDA 0365S04H03	J87
	17.8	72.8	MDW 0365NHGS3	J93
	30.9	86.5	MDA 0365S04H05	J87
	31.3	86.8	MDW 0365NHGS5	J93
3.66	10.9	50.0	MDF 0366S2D	J28
	16.2	54.7	MDE 0366S04E02	J13
	30.9	86.5	MDA 0366S04H05	J87
	31.2	86.7	MDE 0366S04H05	J19
	31.3	86.8	MDW 0366NHGS5	J93
3.68	11.0	50.0	MDF 0368S2D	J28
	16.2	54.7	MDE 0368S04E02	J13
	31.2	86.7	MDE 0368S04H05	J19
3.7	11.1	50.0	MDF 0370S2D	J28
	11.1	100.0	MDF 0370L2D	J32
	14.8	72.0	MDF 0370H3D	J34
	16.2	54.7	MDE 0370S04E02	J13
	16.3	54.8	MDW 0370GS2	J40
	17.5	72.5	MDW 0370PHT	J79
	17.7	72.7	MDE 0370S04H03	J19
	17.7	72.7	MDM 0370S04H03	J56
	17.7	72.7	MDW 0370HX3	J64
	17.8	72.8	MDW 0370HGS3	J44
	22.2	60.7	MDE 0370S04E04	J13
	22.2	86.0	MDF 0370H5D	J34
	22.3	60.8	MDW 0370GS4	J40
	30.9	86.5	MDA 0370S04H05	J87
	31.2	86.7	MDE 0370S04H05	J19
	31.2	86.7	MDM 0370S04H05	J56
	31.2	86.7	MDW 0370HX5	J64
	31.3	86.8	MDW 0370HGS5	J44
	31.3	86.8	MDW 0370NHGS5	J93
	39.2	92.7	MDE 0370S04H08	J19
	39.3	92.8	MDW 0370HGS8	J44
	55.2	108.7	MDW 0370XHGS10	J79
	75.2	128.7	MDW 0370XHGS15	J79
	95.2	148.7	MDW 0370XHGS20	J79
	115.2	168.7	MDW 0370XHGS25	J79
	135.2	188.7	MDW 0370XHGS30	J79
3.8	11.4	50.0	MDF 0380S2D	J28
	11.4	100.0	MDF 0380L2D	J32
	15.2	72.0	MDF 0380H3D	J34
	16.0	54.7	MDE 0380S04E02	J13
	16.1	54.8	MDW 0380GS2	J40
	17.3	72.5	MDW 0380PHT	J79
	17.5	72.7	MDE 0380S04H03	J20
	17.5	72.7	MDM 0380S04H03	J56
	17.5	72.7	MDW 0380HX3	J64
	17.6	72.8	MDW 0380HGS3	J44
	22.0	60.7	MDE 0380S04E04	J13
	22.1	60.8	MDW 0380GS4	J40
	22.8	86.0	MDF 0380H5D	J34
	30.8	86.5	MDA 0380S04H05	J87
	31.0	86.7	MDE 0380S04H05	J20
	31.0	86.7	MDM 0380S04H05	J56
	31.0	86.7	MDW 0380HX5	J64
	31.1	86.8	MDW 0380HGS5	J44
	31.1	86.8	MDW 0380NHGS5	J93
	39.0	92.7	MDE 0380S04H08	J20
	39.1	92.8	MDW 0380HGS8	J44
	55.0	108.7	MDW 0380XHGS10	J79
	75.0	128.7	MDW 0380XHGS15	J79
	95.0	148.7	MDW 0380XHGS20	J79
	115.0	168.7	MDW 0380XHGS25	J79
	135.0	188.7	MDW 0380XHGS30	J79
3.9	11.7	50.0	MDF 0390S2D	J28
	11.7	100.0	MDF 0390L2D	J32
	15.6	72.0	MDF 0390H3D	J34
	15.9	54.7	MDE 0390S04E02	J13
	16.0	54.8	MDW 0390GS2	J40
	17.2	72.5	MDW 0390PHT	J79
	17.4	72.7	MDE 0390S04H03	J20

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø3.9 to ø4.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
3.9	17.4	72.7	MDM 0390S04H03	J56
	17.4	72.7	MDW 0390HX3	J64
	17.5	72.8	MDW 0390HGS3	J44
	21.9	60.7	MDE 0390S04E04	J13
	22.0	60.8	MDW 0390GS4	J40
	23.4	86.0	MDF 0390H5D	J34
	30.7	86.5	MDA 0390S04H05	J87
	30.9	86.7	MDE 0390S04H05	J20
	30.9	86.7	MDM 0390S04H05	J56
	30.9	86.7	MDW 0390HX5	J64
	31.0	86.8	MDW 0390HGS5	J44
	31.0	86.8	MDW 0390NHGS5	J93
	38.9	92.7	MDE 0390S04H08	J20
	39.0	92.8	MDW 0390HGS8	J44
	51.0	106.8	MDW 0390NHGS10	J93
	54.9	108.7	MDW 0390XHGS10	J79
	74.9	128.7	MDW 0390XHGS15	J79
	94.9	148.7	MDW 0390XHGS20	J79
	114.9	168.7	MDW 0390XHGS25	J79
	134.9	188.7	MDW 0390XHGS30	J79
4.0	12.0	50.0	MDF 0400S2D	J28
	12.0	100.0	MDF 0400L2D	J32
	15.7	54.7	MDE 0400S04E02	J13
	15.8	54.8	MDW 0400GS2	J40
	16.0	72.0	MDF 0400H3D	J34
	17.0	72.5	MDA 0400S04H03	J87
	17.0	72.5	MDW 0400PHT	J79
	17.2	72.7	MDE 0400S04H03	J20
	17.2	72.7	MDM 0400S04H03	J56
	17.2	72.7	MDW 0400HX3	J64
	17.3	60.8	MDW 0400SGS3	J75
	17.3	72.8	MDW 0400HGS3	J44
	17.3	72.8	MDW 0400NHGS3	J93
	18.5	62.0	MDS 04000SDC3	J97
	21.7	60.7	MDE 0400S04E04	J13
	21.8	60.8	MDW 0400GS4	J40
	24.0	86.0	MDF 0400H5D	J34
	30.5	86.5	MDA 0400S04H05	J87
	30.7	86.7	MDE 0400S04H05	J20
	30.7	86.7	MDM 0400S04H05	J56
	30.7	86.7	MDW 0400HX5	J64
	30.8	86.8	MDW 0400HGS5	J44
	30.8	86.8	MDW 0400NHGS5	J93
	38.7	92.7	MDE 0400S04H08	J20
	38.7	92.7	MDW 0400HX8	J64
	38.8	92.8	MDW 0400HGS8	J44
	50.7	106.7	MDA 0400S04H10	J87
	50.8	106.8	MDW 0400NHGS10	J93
	54.7	108.7	MDW 0400XHGS10	J79
	62.7	116.7	MDW 0400XHGS12	J79
	74.7	128.7	MDW 0400XHGS15	J79
	94.7	148.7	MDW 0400XHGS20	J79
	114.7	168.7	MDW 0400XHGS25	J79
	134.7	188.7	MDW 0400XHGS30	J79
4.1	12.3	60.0	MDF 0410S2D	J28
	12.3	100.0	MDF 0410L2D	J32
	16.4	80.0	MDF 0410H3D	J34
	17.6	61.7	MDE 0410S05E02	J13
	17.7	61.8	MDW 0410GS2	J40
	19.4	80.5	MDA 0410S06H03	J87
	19.4	80.5	MDW 0410PHT	J79
	19.6	80.7	MDE 0410S05H03	J20
	19.6	80.7	MDM 0410S05H03	J56
	19.6	80.7	MDW 0410HX3	J64
	19.7	80.8	MDW 0410HGS3	J44
	19.7	80.8	MDW 0410NHGS3	J93
	24.6	98.0	MDF 0410H5D	J34
	25.6	76.7	MDE 0410S05E04	J13
	25.7	76.8	MDW 0410GS4	J40
	34.4	98.5	MDA 0410S06H05	J87
	34.6	98.7	MDE 0410S05H05	J20
	34.6	98.7	MDM 0410S05H05	J56
	34.6	98.7	MDW 0410HX5	J64
	34.7	98.8	MDW 0410HGS5	J44
	34.7	98.8	MDW 0410NHGS5	J93
	44.1	105.7	MDE 0410S05H08	J20
	44.2	105.8	MDW 0410HGS8	J44
	62.6	120.7	MDW 0410XHGS10	J79
	82.6	140.7	MDW 0410XHGS15	J79
	105.6	163.7	MDW 0410XHGS20	J79

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø4.1 to ø4.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
4.1	127.6	185.7	MDW 0410XHGS25	J79
	150.6	208.7	MDW 0410XHGS30	J79
4.2	12.6	60.0	MDF 0420S2D	J28
	12.6	100.0	MDF 0420L2D	J32
	16.8	80.0	MDF 0420H3D	J34
	17.5	61.8	MDE 0420S05E02	J13
	17.6	61.9	MDW 0420GS2	J40
	19.3	80.6	MDA 0420S06H03	J87
	19.3	80.6	MDW 0420PHT	J79
	19.5	80.8	MDE 0420S05H03	J20
	19.5	80.8	MDM 0420S05H03	J56
	19.5	80.8	MDW 0420HX3	J64
	19.6	80.9	MDW 0420HGS3	J44
	19.6	80.9	MDW 0420NHGS3	J93
	25.2	98.0	MDF 0420H5D	J34
	25.5	76.8	MDE 0420S05E04	J13
	25.6	76.9	MDW 0420GS4	J40
	34.3	98.6	MDA 0420S06H05	J87
	34.5	98.8	MDE 0420S05H05	J20
	34.5	98.8	MDM 0420S05H05	J56
	34.5	98.8	MDW 0420HX5	J64
	34.6	98.9	MDW 0420HGS5	J44
	34.6	98.9	MDW 0420NHGS5	J93
	44.0	105.8	MDE 0420S05H08	J20
	44.1	105.9	MDW 0420HGS8	J44
	62.5	120.8	MDW 0420XHGS10	J79
	82.5	140.8	MDW 0420XHGS15	J79
	105.5	163.8	MDW 0420XHGS20	J79
	127.5	185.8	MDW 0420XHGS25	J79
	150.5	208.8	MDW 0420XHGS30	J79
4.3	12.9	60.0	MDF 0430S2D	J28
	12.9	100.0	MDF 0430L2D	J32
	17.2	80.0	MDF 0430H3D	J34
	17.4	61.8	MDE 0430S05E02	J13
	17.5	61.9	MDW 0430GS2	J40
	19.2	80.6	MDW 0430PHT	J79
	19.4	80.8	MDE 0430S05H03	J20
	19.4	80.8	MDM 0430S05H03	J56
	19.4	80.8	MDW 0430HX3	J64
	19.5	80.9	MDW 0430HGS3	J44
	25.4	76.8	MDE 0430S05E04	J13
	25.5	76.9	MDW 0430GS4	J40
	25.8	98.0	MDF 0430H5D	J34
	34.1	98.6	MDA 0430S06H05	J87
	34.4	98.8	MDE 0430S05H05	J20
	34.4	98.8	MDM 0430S05H05	J56
	34.4	98.8	MDW 0430HX5	J64
	34.5	98.9	MDW 0430HGS5	J44
	34.5	98.9	MDW 0430NHGS5	J93
	43.9	105.8	MDE 0430S05H08	J20
	44.0	105.9	MDW 0430HGS8	J44
	62.4	120.8	MDW 0430XHGS10	J79
	82.4	140.8	MDW 0430XHGS15	J79
	105.4	163.8	MDW 0430XHGS20	J79
	127.4	185.8	MDW 0430XHGS25	J79
	150.4	208.8	MDW 0430XHGS30	J79
4.4	13.2	60.0	MDF 0440S2D	J28
	13.2	100.0	MDF 0440L2D	J32
	17.2	61.8	MDE 0440S05E02	J13
	17.3	61.9	MDW 0440GS2	J40
	17.6	80.0	MDF 0440H3D	J34
	19.0	80.6	MDW 0440PHT	J79
	19.2	80.8	MDE 0440S05H03	J20
	19.2	80.8	MDM 0440S05H03	J56
	19.2	80.8	MDW 0440HX3	J64
	19.3	80.9	MDW 0440HGS3	J44
	25.2	76.8	MDE 0440S05E04	J13
	25.3	76.9	MDW 0440GS4	J40
	26.4	98.0	MDF 0440H5D	J34
	34.0	98.6	MDA 0440S06H05	J87
	34.2	98.8	MDE 0440S05H05	J20
	34.2	98.8	MDM 0440S05H05	J56
	34.2	98.8	MDW 0440HX5	J64
	34.3	98.9	MDW 0440HGS5	J44
	34.3	98.9	MDW 0440NHGS5	J93
	43.7	105.8	MDE 0440S05H08	J20
	43.8	105.9	MDW 0440HGS8	J44
	62.2	120.8	MDW 0440XHGS10	J79
	82.2	140.8	MDW 0440XHGS15	J79
	105.2	163.8	MDW 0440XHGS20	J79

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø4.4 to ø4.7mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
4.4	127.2	185.8	MDW 0440XHGS25	J79
	150.2	208.8	MDW 0440XHGS30	J79
4.5	13.5	60.0	MDF 0450S2D	J28
	13.5	100.0	MDF 0450L2D	J32
	17.1	61.8	MDE 0450S05E02	J13
	17.2	61.9	MDW 0450GS2	J40
	18.0	80.0	MDF 0450H3D	J34
	18.9	80.6	MDA 0450S06H03	J87
	18.9	80.6	MDW 0450PHT	J79
	19.1	80.8	MDE 0450S05H03	J20
	19.1	80.8	MDM 0450S05H03	J56
	19.1	80.8	MDW 0450HX3	J64
	19.2	76.9	MDW 0450SGS3	J75
	19.2	80.9	MDW 0450HGS3	J44
	19.2	80.9	MDW 0450NHGS3	J93
	25.1	76.8	MDE 0450S05E04	J13
	25.2	76.9	MDW 0450GS4	J40
	27.0	98.0	MDF 0450H5D	J34
	33.9	98.6	MDA 0450S06H05	J87
	34.1	98.8	MDE 0450S05H05	J20
	34.1	98.8	MDM 0450S05H05	J56
	34.1	98.8	MDW 0450HX5	J64
	34.2	98.9	MDW 0450HGS5	J44
	34.2	98.9	MDW 0450NHGS5	J93
	43.6	105.8	MDE 0450S05H08	J20
	43.6	105.8	MDW 0450HX8	J64
	43.7	105.9	MDW 0450HGS8	J44
	57.1	121.8	MDA 0450S06H10	J87
	57.2	121.9	MDW 0450NHGS10	J93
	62.1	120.8	MDW 0450XHGS10	J79
	69.1	127.8	MDW 0450XHGS12	J79
	82.1	140.8	MDW 0450XHGS15	J79
	105.1	163.8	MDW 0450XHGS20	J79
	127.1	185.8	MDW 0450XHGS25	J79
	150.1	208.8	MDW 0450XHGS30	J79
4.6	13.8	60.0	MDF 0460S2D	J28
	13.8	100.0	MDF 0460L2D	J32
	18.4	80.0	MDF 0460H3D	J34
	18.9	61.8	MDE 0460S05E02	J13
	19.1	62.0	MDW 0460GS2	J40
	20.7	80.6	MDA 0460S06H03	J87
	21.2	80.6	MDW 0460PHT	J79
	21.4	80.8	MDE 0460S05H03	J20
	21.4	80.8	MDM 0460S05H03	J56
	21.4	80.8	MDW 0460HX3	J64
	21.6	81.0	MDW 0460HGS3	J44
	21.6	81.0	MDW 0460NHGS3	J93
	27.6	98.0	MDF 0460H5D	J34
	31.9	76.8	MDE 0460S05E04	J13
	32.1	77.0	MDW 0460GS4	J40
	37.7	98.6	MDA 0460S06H05	J87
	37.9	98.8	MDE 0460S05H05	J20
	37.9	98.8	MDM 0460S05H05	J56
	37.9	98.8	MDW 0460HX5	J64
	38.1	99.0	MDW 0460HGS5	J44
	38.1	99.0	MDW 0460NHGS5	J93
	48.9	105.8	MDE 0460S05H08	J20
	49.1	106.0	MDW 0460HGS8	J44
	68.9	125.8	MDW 0460XHGS10	J79
	93.9	150.8	MDW 0460XHGS15	J79
	118.9	175.8	MDW 0460XHGS20	J79
	143.9	200.8	MDW 0460XHGS25	J79
	168.9	225.8	MDW 0460XHGS30	J79
4.62	13.8	60.0	MDF 0462S2D	J28
	18.9	61.8	MDE 0462S05E02	J13
	37.9	98.8	MDE 0462S05H05	J20
4.64	13.9	60.0	MDF 0464S2D	J28
	18.9	61.8	MDE 0464S05E02	J13
	37.9	98.8	MDE 0464S05H05	J20
4.7	14.1	60.0	MDF 0470S2D	J28
	14.1	100.0	MDF 0470L2D	J32
	18.8	80.0	MDF 0470H3D	J34
	18.9	61.9	MDE 0470S05E02	J13
	19.0	62.0	MDW 0470GS2	J40
	21.1	80.6	MDW 0470PHT	J79
	21.4	80.9	MDE 0470S05H03	J20
	21.4	80.9	MDM 0470S05H03	J56
	21.4	80.9	MDW 0470HX3	J64
	21.5	81.0	MDW 0470HGS3	J44
	28.2	98.0	MDF 0470H5D	J34

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø4.7 to ø5.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
4.7	31.9	76.9	MDE 0470S05E04	J13
	32.0	77.0	MDW 0470GS4	J40
	37.6	98.6	MDA 0470S06H05	J87
	37.9	98.9	MDE 0470S05H05	J20
	37.9	98.9	MDM 0470S05H05	J56
	37.9	98.9	MDW 0470HX5	J64
	38.0	99.0	MDW 0470HGS5	J44
	38.0	99.0	MDW 0470NHGS5	J93
	48.9	105.9	MDE 0470S05H08	J20
	49.0	106.0	MDW 0470HGS8	J44
	68.9	125.9	MDW 0470XHGS10	J79
	93.9	150.9	MDW 0470XHGS15	J79
	118.9	175.9	MDW 0470XHGS20	J79
	143.9	200.9	MDW 0470XHGS25	J79
	168.9	225.9	MDW 0470XHGS30	J79
4.8	14.4	60.0	MDF 0480S2D	J28
	14.4	100.0	MDF 0480L2D	J32
	18.7	61.9	MDE 0480S05E02	J13
	18.8	62.0	MDW 0480GS2	J40
	19.2	80.0	MDF 0480H3D	J34
	20.9	80.6	MDW 0480PHT	J79
	21.2	80.9	MDE 0480S05H03	J20
	21.2	80.9	MDM 0480S05H03	J56
	21.2	80.9	MDW 0480HX3	J64
	21.3	81.0	MDW 0480HGS3	J44
	28.8	98.0	MDF 0480H5D	J34
	31.7	76.9	MDE 0480S05E04	J13
	31.8	77.0	MDW 0480GS4	J40
	37.4	98.6	MDA 0480S06H05	J87
	37.7	98.9	MDE 0480S05H05	J20
	37.7	98.9	MDM 0480S05H05	J56
	37.7	98.9	MDW 0480HX5	J64
	37.8	99.0	MDW 0480HGS5	J44
	37.8	99.0	MDW 0480NHGS5	J93
	48.7	105.9	MDE 0480S05H08	J20
	48.8	106.0	MDW 0480HGS8	J44
	61.7	121.9	MDA 0480S06H10	J87
	68.7	125.9	MDW 0480XHGS10	J79
	93.7	150.9	MDW 0480XHGS15	J79
	118.7	175.9	MDW 0480XHGS20	J79
	143.7	200.9	MDW 0480XHGS25	J79
	168.7	225.9	MDW 0480XHGS30	J79
4.851	21.3	77.1	MDS 04851SDC3	J97
4.9	14.7	60.0	MDF 0490S2D	J28
	14.7	100.0	MDF 0490L2D	J32
	18.6	61.9	MDE 0490S05E02	J13
	18.7	62.0	MDW 0490GS2	J40
	19.6	80.0	MDF 0490H3D	J34
	20.9	80.7	MDW 0490PHT	J79
	21.1	80.9	MDE 0490S05H03	J20
	21.1	80.9	MDM 0490S05H03	J56
	21.1	80.9	MDW 0490HX3	J64
	21.2	81.0	MDW 0490HGS3	J44
	29.4	98.0	MDF 0490H5D	J34
	31.6	76.9	MDE 0490S05E04	J13
	31.7	77.0	MDW 0490GS4	J40
	37.5	98.7	MDA 0490S06H05	J87
	37.6	98.9	MDE 0490S05H05	J20
	37.6	98.9	MDM 0490S05H05	J56
	37.6	98.9	MDW 0490HX5	J64
	37.7	99.0	MDW 0490HGS5	J44
	37.7	99.0	MDW 0490NHGS5	J93
	48.6	105.9	MDE 0490S05H08	J20
	48.7	106.0	MDW 0490HGS8	J44
	61.7	121.9	MDA 0490S06H10	J87
	63.7	122.0	MDW 0490NHGS10	J93
	68.6	125.9	MDW 0490XHGS10	J79
	93.6	150.9	MDW 0490XHGS15	J79
	118.6	175.9	MDW 0490XHGS20	J79
	143.6	200.9	MDW 0490XHGS25	J79
	168.6	225.9	MDW 0490XHGS30	J79
5.0	15.0	60.0	MDF 0500S2D	J28
	15.0	100.0	MDF 0500L2D	J32
	18.4	61.9	MDE 0500S05E02	J13
	18.5	62.0	MDW 0500GS2	J40
	20.0	80.0	MDF 0500H3D	J34
	20.2	80.7	MDA 0500S06H03	J87
	20.7	80.7	MDW 0500PHT	J79
	20.9	80.9	MDE 0500S05H03	J20
	20.9	80.9	MDM 0500S05H03	J56

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø5.0 to ø5.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
5.0	20.9	80.9	MDW 0500HX3	J64
	21.0	77.0	MDW 0500SGS3	J75
	21.0	81.0	MDW 0500HGS3	J44
	21.0	81.0	MDW 0500HY3	J71
	21.0	81.0	MDW 0500NHGS3	J93
	21.2	77.2	MDS 05000SDC3	J97
	30.0	98.0	MDF 0500H5D	J34
	31.4	76.9	MDE 0500S05E04	J13
	31.5	77.0	MDW 0500GS4	J40
	37.2	98.7	MDA 0500S06H05	J87
	37.4	98.9	MDE 0500S05H05	J20
	37.4	98.9	MDM 0500S05H05	J56
	37.4	98.9	MDW 0500HX5	J64
	37.5	99.0	MDW 0500HGS5	J44
	37.5	99.0	MDW 0500HY5	J71
	37.5	99.0	MDW 0500NHGS5	J93
	48.4	105.9	MDE 0500S05H08	J20
	48.4	105.9	MDW 0500HX8	J64
	48.5	106.0	MDW 0500HGS8	J44
	48.5	106.0	MDW 0500HY8	J71
	61.4	121.9	MDA 0500S06H10	J87
	63.5	122.0	MDW 0500NHGS10	J93
	68.4	125.9	MDW 0500XHGS10	J79
	78.4	135.9	MDW 0500XHGS12	J79
	93.4	150.9	MDW 0500XHGS15	J79
	118.4	175.9	MDW 0500XHGS20	J79
	143.4	200.9	MDW 0500XHGS25	J79
	168.4	225.9	MDW 0500XHGS30	J79
5.1	15.3	60.0	MDF 0510S2D	J28
	15.3	110.0	MDF 0510L2D	J32
	18.3	65.9	MDE 0510S06E02	J14
	18.5	66.1	MDW 0510GS2	J40
	20.4	82.0	MDF 0510H3D	J34
	20.6	82.7	MDW 0510PHT	J79
	20.8	82.9	MDE 0510S06H03	J20
	20.8	82.9	MDM 0510S06H03	J56
	20.8	82.9	MDW 0510HX3	J64
	21.0	83.1	MDW 0510HGS3	J45
	21.0	83.1	MDW 0510HY3	J71
	30.6	100.0	MDF 0510H5D	J34
	32.3	81.9	MDE 0510S06E04	J14
	32.5	82.1	MDW 0510GS4	J40
	37.0	100.7	MDA 0510S06H05	J87
	37.3	100.9	MDE 0510S06H05	J20
	37.3	100.9	MDM 0510S06H05	J56
	37.3	100.9	MDW 0510HX5	J64
	37.5	101.1	MDW 0510HGS5	J45
	37.5	101.1	MDW 0510HY5	J71
	37.5	101.1	MDW 0510NHGS5	J93
	53.8	118.9	MDE 0510S06H08	J20
	53.8	118.9	MDW 0510HX8	J64
	54.0	119.1	MDW 0510HGS8	J45
	70.3	136.9	MDA 0510S06H10	J87
	70.5	137.1	MDW 0510NHGS10	J93
	76.3	137.9	MDW 0510XHGS10	J79
	101.3	162.9	MDW 0510XHGS15	J79
	131.3	192.9	MDW 0510XHGS20	J79
	156.3	217.9	MDW 0510XHGS25	J79
	184.3	245.9	MDW 0510XHGS30	J79
5.2	15.6	60.0	MDF 0520S2D	J28
	15.6	110.0	MDF 0520L2D	J32
	18.1	65.9	MDE 0520S06E02	J14
	18.3	66.1	MDW 0520GS2	J40
	20.4	82.7	MDA 0520S06H03	J87
	20.4	82.7	MDW 0520PHT	J79
	20.6	82.9	MDE 0520S06H03	J20
	20.6	82.9	MDM 0520S06H03	J56
	20.6	82.9	MDW 0520HX3	J64
	20.8	82.0	MDF 0520H3D	J34
	20.8	83.1	MDW 0520HGS3	J45
	20.8	83.1	MDW 0520NHGS3	J93
	31.2	100.0	MDF 0520H5D	J34
	32.1	81.9	MDE 0520S06E04	J14
	32.3	82.1	MDW 0520GS4	J40
	36.9	100.7	MDA 0520S06H05	J87
	37.1	100.9	MDE 0520S06H05	J20
	37.1	100.9	MDM 0520S06H05	J56
	37.1	100.9	MDW 0520HX5	J64
	37.3	101.1	MDW 0520HGS5	J45
	37.3	101.1	MDW 0520NHGS5	J93

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø5.2 to ø5.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
5.2	53.6	118.9	MDE 0520S06H08	J20
	53.8	119.1	MDW 0520HGS8	J45
	76.1	137.9	MDW 0520XHGS10	J79
	101.1	162.9	MDW 0520XHGS15	J79
	131.1	192.9	MDW 0520XHGS20	J79
	156.1	217.9	MDW 0520XHGS25	J79
	184.1	245.9	MDW 0520XHGS30	J79
5.3	15.9	60.0	MDF 0530S2D	J28
	15.9	110.0	MDF 0530L2D	J32
	18.1	66.0	MDE 0530S06E02	J14
	18.2	66.1	MDW 0530GS2	J40
	20.3	82.7	MDA 0530S06H03	J87
	20.3	82.7	MDW 0530PHT	J80
	20.6	83.0	MDE 0530S06H03	J20
	20.6	83.0	MDM 0530S06H03	J56
	20.6	83.0	MDW 0530HX3	J64
	20.7	83.1	MDW 0530HGS3	J45
	20.7	83.1	MDW 0530NHGS3	J93
	21.2	82.0	MDF 0530H3D	J34
	31.8	100.0	MDF 0530H5D	J34
	32.1	82.0	MDE 0530S06E04	J14
	32.2	82.1	MDW 0530GS4	J40
	36.8	100.7	MDA 0530S06H05	J87
	37.1	101.0	MDE 0530S06H05	J20
	37.1	101.0	MDM 0530S06H05	J56
	37.1	101.0	MDW 0530HX5	J64
	37.2	101.1	MDW 0530HGS5	J45
	37.2	101.1	MDW 0530NHGS5	J93
	53.6	119.0	MDE 0530S06H08	J20
	53.7	119.1	MDW 0530HGS8	J45
	76.1	138.0	MDW 0530XHGS10	J80
	101.1	163.0	MDW 0530XHGS15	J80
	131.1	193.0	MDW 0530XHGS20	J80
	156.1	218.0	MDW 0530XHGS25	J80
	184.1	246.0	MDW 0530XHGS30	J80
5.4	16.2	60.0	MDF 0540S2D	J28
	16.2	110.0	MDF 0540L2D	J32
	17.9	66.0	MDE 0540S06E02	J14
	18.0	66.1	MDW 0540GS2	J40
	20.1	82.7	MDW 0540PHT	J80
	20.4	83.0	MDE 0540S06H03	J20
	20.4	83.0	MDM 0540S06H03	J56
	20.4	83.0	MDW 0540HX3	J64
	20.5	83.1	MDW 0540HGS3	J45
	21.6	82.0	MDF 0540H3D	J34
	31.9	82.0	MDE 0540S06E04	J14
	32.0	82.1	MDW 0540GS4	J40
	32.4	100.0	MDF 0540H5D	J34
	36.6	100.7	MDA 0540S06H05	J87
	36.9	101.0	MDE 0540S06H05	J20
	36.9	101.0	MDM 0540S06H05	J56
	36.9	101.0	MDW 0540HX5	J64
	37.0	101.1	MDW 0540HGS5	J45
	37.0	101.1	MDW 0540NHGS5	J93
	53.4	119.0	MDE 0540S06H08	J20
	53.5	119.1	MDW 0540HGS8	J45
	75.9	138.0	MDW 0540XHGS10	J80
	100.9	163.0	MDW 0540XHGS15	J80
	130.9	193.0	MDW 0540XHGS20	J80
	155.9	218.0	MDW 0540XHGS25	J80
	183.9	246.0	MDW 0540XHGS30	J80
5.5	16.5	60.0	MDF 0550S2D	J28
	16.5	110.0	MDF 0550L2D	J32
	17.8	66.0	MDE 0550S06E02	J14
	17.9	66.1	MDW 0550GS2	J40
	20.0	82.7	MDA 0550S06H03	J87
	20.0	82.7	MDW 0550PHT	J80
	20.3	83.0	MDE 0550S06H03	J20
	20.3	83.0	MDM 0550S06H03	J56
	20.3	83.0	MDW 0550HX3	J64
	20.4	82.1	MDW 0550SGS3	J75
	20.4	83.1	MDW 0550HGS3	J45
	20.4	83.1	MDW 0550NHGS3	J93
	22.0	82.0	MDF 0550H3D	J34
	31.8	82.0	MDE 0550S06E04	J14
	31.9	82.1	MDW 0550GS4	J40
	33.0	100.0	MDF 0550H5D	J34
	36.5	100.7	MDA 0550S06H05	J87
	36.8	101.0	MDE 0550S06H05	J20
	36.8	101.0	MDM 0550S06H05	J56

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø5.5 to ø5.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
5.5	36.8	101.0	MDW 0550HX5	J64
	36.9	101.1	MDW 0550HGS5	J45
	36.9	101.1	MDW 0550NHGS5	J93
	53.3	119.0	MDE 0550S06H08	J20
	53.3	119.0	MDW 0550HX8	J64
	53.4	119.1	MDW 0550HGS8	J45
	69.8	137.0	MDA 0550S06H10	J87
	69.9	137.1	MDW 0550NHGS10	J93
	75.8	138.0	MDW 0550XHGS10	J80
	84.8	147.0	MDW 0550XHGS12	J80
	100.8	163.0	MDW 0550XHGS15	J80
	130.8	193.0	MDW 0550XHGS20	J80
	155.8	218.0	MDW 0550XHGS25	J80
	183.8	246.0	MDW 0550XHGS30	J80
5.52	16.5	60.0	MDF 0552S2D	J28
	19.6	66.0	MDE 0552S06E02	J14
	40.6	101.0	MDE 0552S06H05	J20
5.54	16.6	60.0	MDF 0554S2D	J28
	19.6	66.0	MDE 0554S06E02	J14
	40.6	101.0	MDE 0554S06H05	J20
5.6	16.8	60.0	MDF 0560S2D	J28
	16.8	110.0	MDF 0560L2D	J32
	19.6	66.0	MDE 0560S06E02	J14
	19.8	66.2	MDW 0560GS2	J40
	22.4	82.0	MDF 0560H3D	J34
	22.4	82.8	MDW 0560PHT	J80
	22.6	83.0	MDE 0560S06H03	J20
	22.6	83.0	MDM 0560S06H03	J56
	22.6	83.0	MDW 0560HX3	J64
	22.8	83.2	MDW 0560HGS3	J45
	22.9	82.3	MDS 05600SDC3	J97
	33.6	82.0	MDE 0560S06E04	J14
	33.6	100.0	MDF 0560H5D	J34
	33.8	82.2	MDW 0560GS4	J40
	40.3	100.7	MDA 0560S06H05	J87
	40.6	101.0	MDE 0560S06H05	J20
	40.6	101.0	MDM 0560S06H05	J56
	40.6	101.0	MDW 0560HX5	J64
	40.8	101.2	MDW 0560HGS5	J45
	40.8	101.2	MDW 0560NHGS5	J93
	58.6	119.0	MDE 0560S06H08	J20
	58.8	119.2	MDW 0560HGS8	J45
	76.6	137.0	MDA 0560S06H10	J87
	82.6	143.0	MDW 0560XHGS10	J80
	112.6	173.0	MDW 0560XHGS15	J80
	142.6	203.0	MDW 0560XHGS20	J80
	172.6	233.0	MDW 0560XHGS25	J80
	202.6	263.0	MDW 0560XHGS30	J80
5.7	17.1	60.0	MDF 0570S2D	J28
	17.1	110.0	MDF 0570L2D	J32
	19.5	66.0	MDE 0570S06E02	J14
	19.7	66.2	MDW 0570GS2	J40
	22.3	82.8	MDW 0570PHT	J80
	22.5	83.0	MDE 0570S06H03	J20
	22.5	83.0	MDM 0570S06H03	J56
	22.5	83.0	MDW 0570HX3	J64
	22.7	83.2	MDW 0570HGS3	J45
	22.8	82.0	MDF 0570H3D	J34
	33.5	82.0	MDE 0570S06E04	J14
	33.7	82.2	MDW 0570GS4	J40
	34.2	100.0	MDF 0570H5D	J34
	40.2	100.8	MDA 0570S06H05	J87
	40.5	101.0	MDE 0570S06H05	J20
	40.5	101.0	MDM 0570S06H05	J56
	40.5	101.0	MDW 0570HX5	J64
	40.7	101.2	MDW 0570HGS5	J45
	40.7	101.2	MDW 0570NHGS5	J93
	58.5	119.0	MDE 0570S06H08	J20
	58.7	119.2	MDW 0570HGS8	J45
	82.5	143.0	MDW 0570XHGS10	J80
	112.5	173.0	MDW 0570XHGS15	J80
	142.5	203.0	MDW 0570XHGS20	J80
	172.5	233.0	MDW 0570XHGS25	J80
	202.5	263.0	MDW 0570XHGS30	J80
5.8	17.4	60.0	MDF 0580S2D	J28
	17.4	110.0	MDF 0580L2D	J32
	19.4	66.1	MDE 0580S06E02	J14
	19.5	66.2	MDW 0580GS2	J40
	22.1	82.8	MDW 0580PHT	J80
	22.4	83.1	MDE 0580S06H03	J20

● Diameter ø5.8 to ø6.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
5.8	22.4	83.1	MDM 0580S06H03	J56
	22.4	83.1	MDW 0580HX3	J64
	22.5	83.2	MDW 0580HGS3	J45
	23.2	82.0	MDF 0580H3D	J34
	33.4	82.1	MDE 0580S06E04	J14
	33.5	82.2	MDW 0580GS4	J40
	34.8	100.0	MDF 0580H5D	J34
	40.1	100.8	MDA 0580S06H05	J87
	40.4	101.1	MDE 0580S06H05	J20
	40.4	101.1	MDM 0580S06H05	J56
	40.4	101.1	MDW 0580HX5	J64
	40.5	101.2	MDW 0580HGS5	J45
	40.5	101.2	MDW 0580NHGS5	J93
	58.4	119.1	MDE 0580S06H08	J20
	58.4	119.1	MDW 0580HX8	J64
	58.5	119.2	MDW 0580HGS8	J45
	76.4	137.1	MDA 0580S06H10	J87
	82.4	143.1	MDW 0580XHGS10	J80
	112.4	173.1	MDW 0580XHGS15	J80
	142.4	203.1	MDW 0580XHGS20	J80
	172.4	233.1	MDW 0580XHGS25	J80
	202.4	263.1	MDW 0580XHGS30	J80
5.9	17.7	60.0	MDF 0590S2D	J28
	17.7	110.0	MDF 0590L2D	J32
	19.3	66.1	MDE 0590S06E02	J14
	19.4	66.2	MDW 0590GS2	J40
	21.9	82.8	MDA 0590S06H03	J87
	22.0	82.8	MDW 0590PHT	J80
	22.3	83.1	MDE 0590S06H03	J20
	22.3	83.1	MDM 0590S06H03	J56
	22.3	83.1	MDW 0590HX3	J64
	22.4	83.2	MDW 0590HGS3	J45
	22.4	83.2	MDW 0590NHGS3	J93
	23.6	82.0	MDF 0590H3D	J34
	33.3	82.1	MDE 0590S06E04	J14
	33.4	82.2	MDW 0590GS4	J40
	35.4	100.0	MDF 0590H5D	J34
	39.9	100.8	MDA 0590S06H05	J87
	40.3	101.1	MDE 0590S06H05	J20
	40.3	101.1	MDM 0590S06H05	J56
	40.3	101.1	MDW 0590HX5	J64
	40.4	101.2	MDW 0590HGS5	J45
	40.4	101.2	MDW 0590NHGS5	J93
	58.3	119.1	MDE 0590S06H08	J20
	58.3	119.1	MDW 0590HX8	J64
	58.4	119.2	MDW 0590HGS8	J45
	76.2	137.1	MDA 0590S06H10	J87
	82.3	143.1	MDW 0590XHGS10	J80
	112.3	173.1	MDW 0590XHGS15	J80
	142.3	203.1	MDW 0590XHGS20	J80
	172.3	233.1	MDW 0590XHGS25	J80
	202.3	263.1	MDW 0590XHGS30	J80
6.0	18.0	60.0	MDF 0600S2D	J28
	18.0	110.0	MDF 0600L2D	J32
	18.0	110.0	MDF 0600L2D-S5	J32
	19.1	66.1	MDE 0600S06E02	J14
	19.2	66.2	MDW 0600GS2	J40
	21.8	82.8	MDA 0600S06H03	J87
	21.8	82.8	MDW 0600PHT	J80
	22.1	83.1	MDE 0600S06H03	J20
	22.1	83.1	MDM 0600S06H03	J56
	22.1	83.1	MDW 0600HX3	J64
	22.2	82.2	MDW 0600SGS3	J75
	22.2	83.2	MDW 0600HGS3	J45
	22.2	83.2	MDW 0600HY3	J71
	22.2	83.2	MDW 0600NHGS3	J93
	22.4	82.4	MDS 06000SDC3	J97
	24.0	82.0	MDF 0600H3D	J34
	33.1	82.1	MDE 0600S06E04	J14
	33.2	82.2	MDW 0600GS4	J40
	36.0	100.0	MDF 0600H5D	J34
	39.8	100.8	MDA 0600S06H05	J87
	40.1	101.1	MDE 0600S06H05	J20
	40.1	101.1	MDM 0600S06H05	J56
	40.1	101.1	MDW 0600HX5	J64
	40.2	101.2	MDW 0600HGS5	J45
	40.2	101.2	MDW 0600HY5	J71
	40.2	101.2	MDW 0600NHGS5	J93
	58.1	119.1	MDE 0600S06H08	J20
	58.1	119.1	MDW 0600HX8	J64

● Diameter ø6.0 to ø6.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
6.0	58.2	119.2	MDW 0600HGS8	J45
	58.2	119.2	MDW 0600HY8	J71
	76.1	137.1	MDA 0600S06H10	J87
	76.2	137.2	MDW 0600NHGS10	J93
	82.1	143.1	MDW 0600XHGS10	J80
	94.1	155.1	MDW 0600XHGS12	J80
	112.1	173.1	MDW 0600XHGS15	J80
	142.1	203.1	MDW 0600XHGS20	J80
	172.1	233.1	MDW 0600XHGS25	J80
	202.1	263.1	MDW 0600XHGS30	J80
6.1	18.3	70.0	MDF 0610S2D	J28
	18.3	120.0	MDF 0610L2D	J32
	23.0	74.1	MDE 0610S07E02	J14
	23.2	74.3	MDW 0610GS2	J40
	24.2	88.8	MDW 0610PHT	J80
	24.4	88.0	MDF 0610H3D	J34
	24.5	89.1	MDE 0610S07H03	J20
	24.5	89.1	MDM 0610S07H03	J56
	24.5	89.1	MDW 0610HX3	J64
	24.7	89.3	MDW 0610HGS3	J45
	34.0	84.1	MDE 0610S07E04	J14
	34.2	84.3	MDW 0610GS4	J40
	36.6	109.0	MDF 0610H5D	J34
	43.7	109.8	MDA 0610S08H05	J88
	44.0	110.1	MDE 0610S07H05	J20
	44.0	110.1	MDM 0610S07H05	J56
	44.0	110.1	MDW 0610HX5	J64
	44.2	110.3	MDW 0610HGS5	J45
	44.2	110.3	MDW 0610NHGS5	J93
	63.5	131.1	MDE 0610S07H08	J20
	63.7	131.3	MDW 0610HGS8	J45
	83.0	152.1	MDA 0610S08H10	J88
	83.2	152.3	MDW 0610NHGS10	J93
	90.0	154.1	MDW 0610XHGS10	J80
	120.0	184.1	MDW 0610XHGS15	J80
	153.0	217.1	MDW 0610XHGS20	J80
	185.0	249.1	MDW 0610XHGS25	J80
	218.0	282.1	MDW 0610XHGS30	J80
6.2	18.6	70.0	MDF 0620S2D	J28
	18.6	120.0	MDF 0620L2D	J32
	22.8	74.1	MDE 0620S07E02	J14
	23.0	74.3	MDW 0620GS2	J40
	24.0	88.8	MDW 0620PHT	J80
	24.3	89.1	MDE 0620S07H03	J20
	24.3	89.1	MDM 0620S07H03	J56
	24.3	89.1	MDW 0620HX3	J64
	24.5	89.3	MDW 0620HGS3	J45
	24.8	88.0	MDF 0620H3D	J34
	33.8	84.1	MDE 0620S07E04	J14
	34.0	84.3	MDW 0620GS4	J40
	37.2	109.0	MDF 0620H5D	J34
	43.5	109.8	MDA 0620S08H05	J88
	43.8	110.1	MDE 0620S07H05	J20
	43.8	110.1	MDM 0620S07H05	J56
	43.8	110.1	MDW 0620HX5	J64
	44.0	110.3	MDW 0620HGS5	J45
	44.0	110.3	MDW 0620NHGS5	J93
	63.3	131.1	MDE 0620S07H08	J20
	63.5	131.3	MDW 0620HGS8	J45
	89.8	154.1	MDW 0620XHGS10	J80
	119.8	184.1	MDW 0620XHGS15	J80
	152.8	217.1	MDW 0620XHGS20	J80
	184.8	249.1	MDW 0620XHGS25	J80
	217.8	282.1	MDW 0620XHGS30	J80
6.3	18.9	70.0	MDF 0630S2D	J28
	18.9	120.0	MDF 0630L2D	J32
	22.7	74.1	MDE 0630S07E02	J14
	22.9	74.3	MDW 0630GS2	J40
	23.9	88.8	MDW 0630PHT	J80
	24.2	89.1	MDE 0630S07H03	J20
	24.2	89.1	MDM 0630S07H03	J56
	24.2	89.1	MDW 0630HX3	J64
	24.4	89.3	MDW 0630HGS3	J45
	25.2	88.0	MDF 0630H3D	J34
	33.7	84.1	MDE 0630S07E04	J14
	33.9	84.3	MDW 0630GS4	J40
	37.8	109.0	MDF 0630H5D	J34
	43.4	109.8	MDA 0630S08H05	J88
	43.7	110.1	MDE 0630S07H05	J20
	43.7	110.1	MDM 0630S07H05	J56

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø6.3 to ø6.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
6.3	43.7	110.1	MDW 0630HX5	J64
	43.9	110.3	MDW 0630HGS5	J45
	43.9	110.3	MDW 0630NHGS5	J93
	63.2	131.1	MDE 0630S07H08	J20
	63.4	131.3	MDW 0630HGS8	J45
	89.7	154.1	MDW 0630XHGS10	J80
	119.7	184.1	MDW 0630XHGS15	J80
	152.7	217.1	MDW 0630XHGS20	J80
	184.7	249.1	MDW 0630XHGS25	J80
	217.7	282.1	MDW 0630XHGS30	J80
6.375	24.4	84.5	MDS 06375SDC3	J97
6.4	19.2	70.0	MDF 0640S2D	J28
	19.2	120.0	MDF 0640L2D	J32
	22.6	74.2	MDE 0640S07E02	J14
	22.7	74.3	MDW 0640GS2	J40
	23.8	88.9	MDW 0640PHT	J80
	24.1	89.2	MDE 0640S07H03	J20
	24.1	89.2	MDM 0640S07H03	J56
	24.1	89.2	MDW 0640HX3	J64
	24.2	89.3	MDW 0640HGS3	J45
	25.6	88.0	MDF 0640H3D	J34
	33.6	84.2	MDE 0640S07E04	J14
	33.7	84.3	MDW 0640GS4	J40
	38.4	109.0	MDF 0640H5D	J34
	43.3	109.9	MDA 0640S08H05	J88
	43.6	110.2	MDE 0640S07H05	J20
	43.6	110.2	MDM 0640S07H05	J56
	43.6	110.2	MDW 0640HX5	J64
	43.7	110.3	MDW 0640HGS5	J45
	43.7	110.3	MDW 0640NHGS5	J94
	63.1	131.2	MDE 0640S07H08	J20
	63.2	131.3	MDW 0640HGS8	J45
	89.6	154.2	MDW 0640XHGS10	J80
	119.6	184.2	MDW 0640XHGS15	J80
	152.6	217.2	MDW 0640XHGS20	J80
	184.6	249.2	MDW 0640XHGS25	J80
	217.6	282.2	MDW 0640XHGS30	J80
6.5	19.5	70.0	MDF 0650S2D	J28
	19.5	120.0	MDF 0650L2D	J32
	22.5	74.2	MDE 0650S07E02	J14
	22.6	74.3	MDW 0650GS2	J40
	23.6	88.9	MDA 0650S08H03	J88
	23.7	88.9	MDW 0650PHT	J80
	24.0	89.2	MDE 0650S07H03	J20
	24.0	89.2	MDM 0650S07H03	J56
	24.0	89.2	MDW 0650HX3	J64
	24.1	84.3	MDW 0650SGS3	J75
	24.1	89.3	MDW 0650HGS3	J45
	24.1	89.3	MDW 0650HY3	J71
	24.1	89.3	MDW 0650NHGS3	J94
	26.0	88.0	MDF 0650H3D	J34
	33.5	84.2	MDE 0650S07E04	J14
	33.6	84.3	MDW 0650GS4	J40
	39.0	109.0	MDF 0650H5D	J34
	43.1	109.9	MDA 0650S08H05	J88
	43.5	110.2	MDE 0650S07H05	J20
	43.5	110.2	MDM 0650S07H05	J56
	43.5	110.2	MDW 0650HX5	J64
	43.6	110.3	MDW 0650HGS5	J45
	43.6	110.3	MDW 0650HY5	J71
	43.6	110.3	MDW 0650NHGS5	J94
	63.0	131.2	MDE 0650S07H08	J20
	63.0	131.2	MDW 0650HX8	J64
	63.1	131.3	MDW 0650HGS8	J45
	82.4	152.2	MDA 0650S08H10	J88
	82.6	152.3	MDW 0650NHGS10	J94
	89.5	154.2	MDW 0650XHGS10	J80
	100.5	165.2	MDW 0650XHGS12	J80
	119.5	184.2	MDW 0650XHGS15	J80
	152.5	217.2	MDW 0650XHGS20	J80
	184.5	249.2	MDW 0650XHGS25	J80
	217.5	282.2	MDW 0650XHGS30	J80
6.6	19.8	70.0	MDF 0660S2D	J28
	19.8	120.0	MDF 0660L2D	J32
	24.3	74.2	MDE 0660S07E02	J14
	24.5	74.4	MDW 0660GS2	J41
	26.0	88.9	MDW 0660PHT	J80
	26.3	89.2	MDE 0660S07H03	J21
	26.3	89.2	MDM 0660S07H03	J56
	26.3	89.2	MDW 0660HX3	J65

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø6.6 to ø6.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
6.6	26.4	88.0	MDF 0660H3D	J34
	26.5	89.4	MDW 0660HGS3	J45
	34.3	84.2	MDE 0660S07E04	J14
	34.5	84.4	MDW 0660GS4	J41
	39.6	109.0	MDF 0660H5D	J34
	45.0	109.9	MDA 0660S08H05	J88
	47.3	110.2	MDE 0660S07H05	J21
	47.3	110.2	MDM 0660S07H05	J56
	47.3	110.2	MDW 0660HX5	J65
	47.5	110.4	MDW 0660HGS5	J45
	47.5	110.4	MDW 0660NHGS5	J94
	68.3	131.2	MDE 0660S07H08	J21
	68.5	131.4	MDW 0660HGS8	J45
	96.3	159.2	MDW 0660XHGS10	J80
	131.3	194.2	MDW 0660XHGS15	J80
	166.3	229.2	MDW 0660XHGS20	J80
	201.3	264.2	MDW 0660XHGS25	J80
	236.3	299.2	MDW 0660XHGS30	J80
6.7	20.1	70.0	MDF 0670S2D	J28
	20.1	120.0	MDF 0670L2D	J32
	24.0	88.9	MDA 0670S08H03	J88
	24.2	74.2	MDE 0670S07E02	J14
	24.4	74.4	MDW 0670GS2	J41
	25.9	88.9	MDW 0670PHT	J81
	26.2	89.2	MDE 0670S07H03	J21
	26.2	89.2	MDM 0670S07H03	J56
	26.2	89.2	MDW 0670HX3	J65
	26.4	89.4	MDW 0670HGS3	J45
	26.4	89.4	MDW 0670NHGS3	J94
	26.8	88.0	MDF 0670H3D	J34
	34.2	84.2	MDE 0670S07E04	J14
	34.4	84.4	MDW 0670GS4	J41
	40.2	109.0	MDF 0670H5D	J34
	45.0	109.9	MDA 0670S08H05	J88
	47.2	110.2	MDE 0670S07H05	J21
	47.2	110.2	MDM 0670S07H05	J56
	47.2	110.2	MDW 0670HX5	J65
	47.4	110.4	MDW 0670HGS5	J45
	47.4	110.4	MDW 0670NHGS5	J94
	68.2	131.2	MDE 0670S07H08	J21
	68.2	131.2	MDW 0670HX8	J65
	68.4	131.4	MDW 0670HGS8	J45
	89.4	152.4	MDW 0670NHGS10	J94
	96.2	159.2	MDW 0670XHGS10	J81
	131.2	194.2	MDW 0670XHGS15	J81
	166.2	229.2	MDW 0670XHGS20	J81
	201.2	264.2	MDW 0670XHGS25	J81
	236.2	299.2	MDW 0670XHGS30	J81
6.8	20.4	70.0	MDF 0680S2D	J28
	20.4	120.0	MDF 0680L2D	J32
	23.7	88.9	MDA 0680S08H03	J88
	24.0	74.2	MDE 0680S07E02	J14
	24.2	74.4	MDW 0680GS2	J41
	25.7	88.9	MDW 0680PHT	J81
	26.0	89.2	MDE 0680S07H03	J21
	26.0	89.2	MDM 0680S07H03	J56
	26.0	89.2	MDW 0680HX3	J65
	26.2	89.4	MDW 0680HGS3	J45
	26.2	89.4	MDW 0680HY3	J71
	26.2	89.4	MDW 0680NHGS3	J94
	27.2	88.0	MDF 0680H3D	J34
	34.0	84.2	MDE 0680S07E04	J14
	34.2	84.4	MDW 0680GS4	J41
	40.8	109.0	MDF 0680H5D	J34
	44.7	109.9	MDA 0680S08H05	J88
	47.0	110.2	MDE 0680S07H05	J21
	47.0	110.2	MDM 0680S07H05	J56
	47.0	110.2	MDW 0680HX5	J65
	47.2	110.4	MDW 0680HGS5	J45
	47.2	110.4	MDW 0680HY5	J71
	47.2	110.4	MDW 0680NHGS5	J94
	68.0	131.2	MDE 0680S07H08	J21
	68.0	131.2	MDW 0680HX8	J65
	68.2	131.4	MDW 0680HGS8	J45
	68.2	131.4	MDW 0680HY8	J71
	87.0	152.2	MDA 0680S08H10	J88
	89.2	152.4	MDW 0680NHGS10	J94
	96.0	159.2	MDW 0680XHGS10	J81
	131.0	194.2	MDW 0680XHGS15	J81
	166.0	229.2	MDW 0680XHGS20	J81

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø6.8 to ø7.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
6.8	201.0	264.2	MDW 0680XHGS25	J81
	236.0	299.2	MDW 0680XHGS30	J81
6.9	20.7	70.0	MDF 0690S2D	J28
	20.7	120.0	MDF 0690L2D	J32
	24.0	74.3	MDE 0690S07E02	J14
	24.1	74.4	MDW 0690GS2	J41
	25.6	88.9	MDW 0690PHT	J81
	26.0	89.3	MDE 0690S07H03	J21
	26.0	89.3	MDM 0690S07H03	J56
	26.0	89.3	MDW 0690HX3	J65
	26.1	89.4	MDW 0690HGS3	J45
	27.6	88.0	MDF 0690H3D	J34
	34.0	84.3	MDE 0690S07E04	J14
	34.1	84.4	MDW 0690GS4	J41
	41.4	109.0	MDF 0690H5D	J34
	47.0	110.3	MDE 0690S07H05	J21
	47.0	110.3	MDM 0690S07H05	J56
	47.0	110.3	MDW 0690HX5	J65
	47.1	110.4	MDW 0690HGS5	J45
	47.1	110.4	MDW 0690NHGS5	J94
	68.0	131.3	MDE 0690S07H08	J21
	68.0	131.3	MDW 0690HX8	J65
	68.1	131.4	MDW 0690HGS8	J45
	96.0	159.3	MDW 0690XHGS10	J81
	131.0	194.3	MDW 0690XHGS15	J81
	166.0	229.3	MDW 0690XHGS20	J81
	201.0	264.3	MDW 0690XHGS25	J81
	236.0	299.3	MDW 0690XHGS30	J81
7.0	21.0	70.0	MDF 0700S2D	J28
	21.0	120.0	MDF 0700L2D	J32
	23.4	88.9	MDA 0700S08H03	J88
	23.8	74.3	MDE 0700S07E02	J14
	23.9	74.4	MDW 0700GS2	J41
	25.4	88.9	MDW 0700PHT	J81
	25.8	89.3	MDE 0700S07H03	J21
	25.8	89.3	MDM 0700S07H03	J57
	25.8	89.3	MDW 0700HX3	J65
	25.9	84.4	MDW 0700SGS3	J75
	25.9	89.4	MDW 0700HGS3	J45
	25.9	89.4	MDW 0700HY3	J71
	25.9	89.4	MDW 0700NHGS3	J94
	26.1	84.6	MDS 07000SDC3	J97
	28.0	88.0	MDF 0700H3D	J34
	33.8	84.3	MDE 0700S07E04	J14
	33.9	84.4	MDW 0700GS4	J41
	42.0	109.0	MDF 0700H5D	J34
	44.4	109.9	MDA 0700S08H05	J88
	46.8	110.3	MDE 0700S07H05	J21
	46.8	110.3	MDM 0700S07H05	J57
	46.8	110.3	MDW 0700HX5	J65
	46.9	110.4	MDW 0700HGS5	J45
	46.9	110.4	MDW 0700HY5	J71
	46.9	110.4	MDW 0700NHGS5	J94
	67.8	131.3	MDE 0700S07H08	J21
	67.8	131.3	MDW 0700HX8	J65
	67.9	131.4	MDW 0700HGS8	J45
	86.8	152.3	MDA 0700S08H10	J88
	88.9	152.4	MDW 0700NHGS10	J94
	95.8	159.3	MDW 0700XHGS10	J81
	109.8	173.3	MDW 0700XHGS12	J81
	130.8	194.3	MDW 0700XHGS15	J81
	165.8	229.3	MDW 0700XHGS20	J81
	200.8	264.3	MDW 0700XHGS25	J81
	235.8	299.3	MDW 0700XHGS30	J81
7.1	21.3	70.0	MDF 0710S2D	J28
	21.3	130.0	MDF 0710L2D	J32
	23.7	79.3	MDE 0710S08E02	J14
	23.9	79.5	MDW 0710GS2	J41
	27.9	95.0	MDW 0710PHT	J81
	28.2	95.3	MDE 0710S08H03	J21
	28.2	95.3	MDM 0710S08H03	J57
	28.2	95.3	MDW 0710HX3	J65
	28.4	94.0	MDF 0710H3D	J34
	28.4	95.5	MDW 0710HGS3	J45
	35.7	91.3	MDE 0710S08E04	J14
	35.9	91.5	MDW 0710GS4	J41
	42.6	118.0	MDF 0710H5D	J34
	50.3	118.9	MDA 0710S08H05	J88
	50.7	119.3	MDE 0710S08H05	J21
	50.7	119.3	MDM 0710S08H05	J57

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø7.1 to ø7.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
7.1	50.7	119.3	MDW 0710HX5	J65
	50.9	119.5	MDW 0710HGS5	J45
	50.9	119.5	MDW 0710NHGS5	J94
	73.2	143.3	MDE 0710S08H08	J21
	73.4	143.5	MDW 0710HGS8	J45
	103.7	170.3	MDW 0710XHGS10	J81
	138.7	205.3	MDW 0710XHGS15	J81
	176.7	243.3	MDW 0710XHGS20	J81
	213.7	280.3	MDW 0710XHGS25	J81
	251.7	318.3	MDW 0710XHGS30	J81
7.2	21.6	70.0	MDF 0720S2D	J28
	21.6	130.0	MDF 0720L2D	J32
	23.5	79.3	MDE 0720S08E02	J14
	23.7	79.5	MDW 0720GS2	J41
	27.7	95.0	MDW 0720PHT	J81
	28.0	95.3	MDE 0720S08H03	J21
	28.0	95.3	MDM 0720S08H03	J57
	28.0	95.3	MDW 0720HX3	J65
	28.2	95.5	MDW 0720HGS3	J45
	28.8	94.0	MDF 0720H3D	J34
	35.5	91.3	MDE 0720S08E04	J14
	35.7	91.5	MDW 0720GS4	J41
	43.2	118.0	MDF 0720H5D	J34
	50.2	119.0	MDA 0720S08H05	J88
	50.5	119.3	MDE 0720S08H05	J21
	50.5	119.3	MDM 0720S08H05	J57
	50.5	119.3	MDW 0720HX5	J65
	50.7	119.5	MDW 0720HGS5	J45
	50.7	119.5	MDW 0720NHGS5	J94
	73.0	143.3	MDE 0720S08H08	J21
	73.2	143.5	MDW 0720HGS8	J45
	95.7	167.5	MDW 0720NHGS10	J94
	103.5	170.3	MDW 0720XHGS10	J81
	138.5	205.3	MDW 0720XHGS15	J81
	176.5	243.3	MDW 0720XHGS20	J81
	213.5	280.3	MDW 0720XHGS25	J81
	251.5	318.3	MDW 0720XHGS30	J81
7.3	21.9	70.0	MDF 0730S2D	J28
	21.9	130.0	MDF 0730L2D	J32
	23.4	79.3	MDE 0730S08E02	J14
	23.6	79.5	MDW 0730GS2	J41
	27.6	95.0	MDW 0730PHT	J81
	27.9	95.3	MDE 0730S08H03	J21
	27.9	95.3	MDM 0730S08H03	J57
	27.9	95.3	MDW 0730HX3	J65
	28.1	95.5	MDW 0730HGS3	J45
	29.2	94.0	MDF 0730H3D	J34
	35.4	91.3	MDE 0730S08E04	J14
	35.6	91.5	MDW 0730GS4	J41
	43.8	118.0	MDF 0730H5D	J34
	50.0	119.0	MDA 0730S08H05	J88
	50.4	119.3	MDE 0730S08H05	J21
	50.4	119.3	MDM 0730S08H05	J57
	50.4	119.3	MDW 0730HX5	J65
	50.6	119.5	MDW 0730HGS5	J45
	50.6	119.5	MDW 0730NHGS5	J94
	72.9	143.3	MDE 0730S08H08	J21
	73.1	143.5	MDW 0730HGS8	J45
	103.4	170.3	MDW 0730XHGS10	J81
	138.4	205.3	MDW 0730XHGS15	J81
	176.4	243.3	MDW 0730XHGS20	J81
	213.4	280.3	MDW 0730XHGS25	J81
	251.4	318.3	MDW 0730XHGS30	J81
7.35	27.4	95.0	MDA 0735S08H03	J88
	28.0	95.5	MDW 0735NHGS3	J94
	49.9	119.0	MDA 0735S08H05	J88
	50.5	119.5	MDW 0735NHGS5	J94
7.36	22.0	70.0	MDF 0736S2D	J28
	23.2	79.3	MDE 0736S08E02	J14
	50.2	119.3	MDE 0736S08H05	J21
7.38	22.1	70.0	MDF 0738S2D	J28
	23.2	79.3	MDE 0738S08E02	J14
	50.2	119.3	MDE 0738S08H05	J21
7.4	22.2	70.0	MDF 0740S2D	J28
	22.2	130.0	MDF 0740L2D	J32
	23.2	79.3	MDE 0740S08E02	J14
	23.4	79.5	MDW 0740GS2	J41
	27.4	95.0	MDA 0740S08H03	J88
	27.4	95.0	MDW 0740PHT	J81
	27.7	95.3	MDE 0740S08H03	J21

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø7.4 to ø7.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
7.4	27.7	95.3	MDM 0740S08H03	J57
	27.7	95.3	MDW 0740HX3	J65
	27.9	95.5	MDW 0740HGS3	J45
	27.9	95.5	MDW 0740NHGS3	J94
	29.6	94.0	MDF 0740H3D	J34
	35.2	91.3	MDE 0740S08E04	J14
	35.4	91.5	MDW 0740GS4	J41
	44.4	118.0	MDF 0740H5D	J34
	49.9	119.0	MDA 0740S08H05	J88
	50.2	119.3	MDE 0740S08H05	J21
	50.2	119.3	MDM 0740S08H05	J57
	50.2	119.3	MDW 0740HX5	J65
	50.4	119.5	MDW 0740HGS5	J45
	50.4	119.5	MDW 0740NHGS5	J94
	72.7	143.3	MDE 0740S08H08	J21
	72.9	143.5	MDW 0740HGS8	J45
	103.2	170.3	MDW 0740XHGS10	J81
	138.2	205.3	MDW 0740XHGS15	J81
	176.2	243.3	MDW 0740XHGS20	J81
	213.2	280.3	MDW 0740XHGS25	J81
	251.2	318.3	MDW 0740XHGS30	J81
7.5	22.5	70.0	MDF 0750S2D	J28
	22.5	130.0	MDF 0750L2D	J32
	23.2	79.4	MDE 0750S08E02	J14
	23.4	79.6	MDW 0750GS2	J41
	27.3	95.0	MDA 0750S08H03	J88
	27.3	95.0	MDW 0750PHT	J81
	27.7	95.4	MDE 0750S08H03	J21
	27.7	95.4	MDM 0750S08H03	J57
	27.7	95.4	MDW 0750HX3	J65
	27.9	91.6	MDW 0750SGS3	J75
	27.9	95.6	MDW 0750HGS3	J45
	27.9	95.6	MDW 0750NHGS3	J94
	30.0	94.0	MDF 0750H3D	J34
	35.2	91.4	MDE 0750S08E04	J14
	35.4	91.6	MDW 0750GS4	J41
	45.0	118.0	MDF 0750H5D	J34
	49.8	119.0	MDA 0750S08H05	J88
	50.2	119.4	MDE 0750S08H05	J21
	50.2	119.4	MDM 0750S08H05	J57
	50.2	119.4	MDW 0750HX5	J65
	50.4	119.6	MDW 0750HGS5	J45
	50.4	119.6	MDW 0750NHGS5	J94
	72.7	143.4	MDE 0750S08H08	J21
	72.7	143.4	MDW 0750HX8	J65
	72.9	143.6	MDW 0750HGS8	J45
	95.1	167.4	MDA 0750S08H10	J88
	95.4	167.6	MDW 0750NHGS10	J94
	103.2	170.4	MDW 0750XHGS10	J81
	116.2	183.4	MDW 0750XHGS12	J81
	138.2	205.4	MDW 0750XHGS15	J81
	176.2	243.4	MDW 0750XHGS20	J81
	213.2	280.4	MDW 0750XHGS25	J81
	251.2	318.4	MDW 0750XHGS30	J81
7.52	22.5	70.0	MDF 0752S2D	J28
	26.0	79.4	MDE 0752S08E02	J14
	54.0	119.4	MDE 0752S08H05	J21
7.54	22.6	70.0	MDF 0754S2D	J28
	26.0	79.4	MDE 0754S08E02	J14
	54.0	119.4	MDE 0754S08H05	J21
7.6	22.8	70.0	MDF 0760S2D	J28
	22.8	130.0	MDF 0760L2D	J32
	26.0	79.4	MDE 0760S08E02	J14
	26.2	79.6	MDW 0760GS2	J41
	29.6	95.0	MDW 0760PHT	J81
	30.0	95.4	MDE 0760S08H03	J21
	30.0	95.4	MDM 0760S08H03	J57
	30.0	95.4	MDW 0760HX3	J65
	30.2	95.6	MDW 0760HGS3	J45
	30.4	94.0	MDF 0760H3D	J34
	38.0	91.4	MDE 0760S08E04	J14
	38.2	91.6	MDW 0760GS4	J41
	45.6	118.0	MDF 0760H5D	J34
	53.6	119.0	MDA 0760S08H05	J88
	54.0	119.4	MDE 0760S08H05	J21
	54.0	119.4	MDM 0760S08H05	J57
	54.0	119.4	MDW 0760HX5	J65
	54.2	119.6	MDW 0760HGS5	J45
	54.2	119.6	MDW 0760NHGS5	J94
	78.0	143.4	MDE 0760S08H08	J21

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø7.6 to ø7.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
7.6	78.2	143.6	MDW 0760HGS8	J45
	110.0	175.4	MDW 0760XHGS10	J81
	150.0	215.4	MDW 0760XHGS15	J81
	190.0	255.4	MDW 0760XHGS20	J81
	230.0	295.4	MDW 0760XHGS25	J81
	270.0	335.4	MDW 0760XHGS30	J81
7.7	23.1	70.0	MDF 0770S2D	J28
	23.1	130.0	MDF 0770L2D	J32
	25.9	79.4	MDE 0770S08E02	J14
	26.1	79.6	MDW 0770GS2	J41
	29.5	95.0	MDW 0770PHT	J81
	29.9	95.4	MDE 0770S08H03	J21
	29.9	95.4	MDM 0770S08H03	J57
	29.9	95.4	MDW 0770HX3	J65
	30.1	95.6	MDW 0770HGS3	J45
	30.8	94.0	MDF 0770H3D	J34
	37.9	91.4	MDE 0770S08E04	J14
	38.1	91.6	MDW 0770GS4	J41
	46.2	118.0	MDF 0770H5D	J34
	53.5	119.0	MDA 0770S08H05	J88
	53.9	119.4	MDE 0770S08H05	J21
	53.9	119.4	MDM 0770S08H05	J57
	53.9	119.4	MDW 0770HX5	J65
	54.1	119.6	MDW 0770HGS5	J45
	54.1	119.6	MDW 0770NHGS5	J94
	77.9	143.4	MDE 0770S08H08	J21
	78.1	143.6	MDW 0770HGS8	J45
	109.9	175.4	MDW 0770XHGS10	J81
	149.9	215.4	MDW 0770XHGS15	J81
	189.9	255.4	MDW 0770XHGS20	J81
	229.9	295.4	MDW 0770XHGS25	J81
	269.9	335.4	MDW 0770XHGS30	J81
7.8	23.4	70.0	MDF 0780S2D	J28
	23.4	130.0	MDF 0780L2D	J32
	25.7	79.4	MDE 0780S08E02	J14
	25.9	79.6	MDW 0780GS2	J41
	29.3	95.0	MDA 0780S08H03	J88
	29.3	95.0	MDW 0780PHT	J81
	29.7	95.4	MDE 0780S08H03	J21
	29.7	95.4	MDM 0780S08H03	J57
	29.7	95.4	MDW 0780HX3	J65
	29.9	95.6	MDW 0780HGS3	J45
	29.9	95.6	MDW 0780NHGS3	J94
	31.2	94.0	MDF 0780H3D	J34
	37.7	91.4	MDE 0780S08E04	J14
	37.9	91.6	MDW 0780GS4	J41
	46.8	118.0	MDF 0780H5D	J34
	53.3	119.0	MDA 0780S08H05	J88
	53.7	119.4	MDE 0780S08H05	J21
	53.7	119.4	MDM 0780S08H05	J57
	53.7	119.4	MDW 0780HX5	J65
	53.9	119.6	MDW 0780HGS5	J45
	53.9	119.6	MDW 0780NHGS5	J94
	77.7	143.4	MDE 0780S08H08	J21
	77.9	143.6	MDW 0780HGS8	J45
	101.7	167.4	MDA 0780S08H10	J88
	101.9	167.6	MDW 0780NHGS10	J94
	109.7	175.4	MDW 0780XHGS10	J81
	149.7	215.4	MDW 0780XHGS15	J81
	189.7	255.4	MDW 0780XHGS20	J81
	229.7	295.4	MDW 0780XHGS25	J81
	269.7	335.4	MDW 0780XHGS30	J81
7.9	23.7	70.0	MDF 0790S2D	J28
	23.7	130.0	MDF 0790L2D	J32
	25.6	79.4	MDE 0790S08E02	J14
	25.8	79.6	MDW 0790GS2	J41
	29.3	95.1	MDW 0790PHT	J81
	29.6	95.4	MDE 0790S08H03	J21
	29.6	95.4	MDM 0790S08H03	J57
	29.6	95.4	MDW 0790HX3	J65
	29.8	95.6	MDW 0790HGS3	J45
	31.6	94.0	MDF 0790H3D	J34
	37.6	91.4	MDE 0790S08E04	J14
	37.8	91.6	MDW 0790GS4	J41
	47.4	118.0	MDF 0790H5D	J34
	53.2	119.1	MDA 0790S08H05	J88
	53.6	119.4	MDE 0790S08H05	J21
	53.6	119.4	MDM 0790S08H05	J57
	53.6	119.4	MDW 0790HX5	J65
	53.8	119.6	MDW 0790HGS5	J45

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø7.9 to ø8.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
7.9	53.8	119.6	MDW 0790NHGS5	J94
	77.6	143.4	MDE 0790S08H08	J21
	77.8	143.6	MDW 0790HGS8	J45
	109.6	175.4	MDW 0790XHGS10	J81
	149.6	215.4	MDW 0790XHGS15	J81
	189.6	255.4	MDW 0790XHGS20	J81
	229.6	295.4	MDW 0790XHGS25	J81
	269.6	335.4	MDW 0790XHGS30	J81
7.938	30.0	91.9	MDS 07938SDC3	J97
8.0	24.0	70.0	MDF 0800S2D	J28
	24.0	130.0	MDF 0800L2D	J32
	24.0	130.0	MDF 0800L2D-S6	J32
	25.5	79.5	MDE 0800S08E02	J14
	25.7	79.7	MDW 0800GS2	J41
	29.1	95.1	MDA 0800S08H03	J88
	29.1	95.1	MDW 0800PHT	J81
	29.5	95.5	MDE 0800S08H03	J21
	29.5	95.5	MDM 0800S08H03	J57
	29.5	95.5	MDW 0800HX3	J65
	29.7	91.7	MDW 0800SGS3	J75
	29.7	95.7	MDW 0800HGS3	J45
	29.7	95.7	MDW 0800HY3	J71
	29.7	95.7	MDW 0800NHGS3	J94
	29.9	91.9	MDS 08000SDC3	J97
	32.0	94.0	MDF 0800H3D	J34
	37.5	91.5	MDE 0800S08E04	J14
	37.7	91.7	MDW 0800GS4	J41
	48.0	118.0	MDF 0800H5D	J34
	53.1	119.1	MDA 0800S08H05	J88
	53.5	119.5	MDE 0800S08H05	J21
	53.5	119.5	MDM 0800S08H05	J57
	53.5	119.5	MDW 0800HX5	J65
	53.7	119.7	MDW 0800HGS5	J45
	53.7	119.7	MDW 0800HY5	J71
	53.7	119.7	MDW 0800NHGS5	J94
	77.5	143.5	MDE 0800S08H08	J21
	77.5	143.5	MDW 0800HX8	J65
	77.7	143.7	MDW 0800HGS8	J45
	101.5	167.5	MDA 0800S08H10	J88
	101.7	167.7	MDW 0800NHGS10	J94
	109.5	175.5	MDW 0800XHGS10	J81
	125.5	191.5	MDW 0800XHGS12	J81
	149.5	215.5	MDW 0800XHGS15	J81
	189.5	255.5	MDW 0800XHGS20	J81
	229.5	295.5	MDW 0800XHGS25	J81
	269.5	335.5	MDW 0800XHGS30	J81
8.1	24.3	80.0	MDF 0810S2D	J28
	24.3	140.0	MDF 0810L2D	J32
	25.4	83.5	MDE 0810S09E02	J14
	25.6	83.7	MDW 0810GS2	J41
	31.9	101.5	MDE 0810S09H03	J21
	31.9	101.5	MDM 0810S09H03	J57
	31.9	101.5	MDW 0810HX3	J65
	32.1	101.7	MDW 0810HGS3	J45
	32.4	100.0	MDF 0810H3D	J34
	42.4	99.5	MDE 0810S09E04	J14
	42.6	99.7	MDW 0810GS4	J41
	48.6	127.0	MDF 0810H5D	J34
	56.9	128.1	MDA 0810S10H05	J88
	57.4	128.5	MDE 0810S09H05	J21
	57.4	128.5	MDM 0810S09H05	J57
	57.4	128.5	MDW 0810HX5	J65
	57.6	128.7	MDW 0810HGS5	J45
	57.6	128.7	MDW 0810NHGS5	J94
	82.9	155.5	MDE 0810S09H08	J21
	83.1	155.7	MDW 0810HGS8	J45
	108.3	182.5	MDA 0810S10H10	J88
8.2	24.6	80.0	MDF 0820S2D	J28
	24.6	140.0	MDF 0820L2D	J32
	25.2	83.5	MDE 0820S09E02	J14
	25.4	83.7	MDW 0820GS2	J41
	31.7	101.5	MDE 0820S09H03	J21
	31.7	101.5	MDM 0820S09H03	J57
	31.7	101.5	MDW 0820HX3	J65
	31.9	101.7	MDW 0820HGS3	J45
	32.8	100.0	MDF 0820H3D	J34
	42.2	99.5	MDE 0820S09E04	J14
	42.4	99.7	MDW 0820GS4	J41
	49.2	127.0	MDF 0820H5D	J34
	56.8	128.1	MDA 0820S10H05	J88

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø8.2 to ø8.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
8.2	57.2	128.5	MDE 0820S09H05	J21
	57.2	128.5	MDM 0820S09H05	J57
	57.2	128.5	MDW 0820HX5	J65
	57.4	128.7	MDW 0820HGS5	J45
	57.4	128.7	MDW 0820NHGS5	J94
	82.7	155.5	MDE 0820S09H08	J21
	82.9	155.7	MDW 0820HGS8	J45
	108.2	182.5	MDA 0820S10H10	J88
8.3	24.9	80.0	MDF 0830S2D	J28
	24.9	140.0	MDF 0830L2D	J32
	25.1	83.5	MDE 0830S09E02	J14
	25.3	83.7	MDW 0830GS2	J41
	31.6	101.5	MDE 0830S09H03	J21
	31.6	101.5	MDM 0830S09H03	J57
	31.6	101.5	MDW 0830HX3	J65
	31.8	101.7	MDW 0830HGS3	J45
	33.2	100.0	MDF 0830H3D	J34
	42.1	99.5	MDE 0830S09E04	J14
	42.3	99.7	MDW 0830GS4	J41
	49.8	127.0	MDF 0830H5D	J34
	56.7	128.1	MDA 0830S10H05	J88
	57.1	128.5	MDE 0830S09H05	J21
	57.1	128.5	MDM 0830S09H05	J57
	57.1	128.5	MDW 0830HX5	J65
	57.3	128.7	MDW 0830HGS5	J45
	57.3	128.7	MDW 0830NHGS5	J94
	82.6	155.5	MDE 0830S09H08	J21
	82.8	155.7	MDW 0830HGS8	J45
8.4	24.9	83.5	MDE 0840S09E02	J14
	25.1	83.7	MDW 0840GS2	J41
	25.2	80.0	MDF 0840S2D	J28
	25.2	140.0	MDF 0840L2D	J32
	31.4	101.5	MDE 0840S09H03	J21
	31.4	101.5	MDM 0840S09H03	J57
	31.4	101.5	MDW 0840HX3	J65
	31.6	101.7	MDW 0840HGS3	J45
	33.6	100.0	MDF 0840H3D	J34
	41.9	99.5	MDE 0840S09E04	J14
	42.1	99.7	MDW 0840GS4	J41
	50.4	127.0	MDF 0840H5D	J34
	56.5	128.1	MDA 0840S10H05	J88
	56.9	128.5	MDE 0840S09H05	J21
	56.9	128.5	MDM 0840S09H05	J57
	56.9	128.5	MDW 0840HX5	J65
	57.1	128.7	MDW 0840HGS5	J45
	57.1	128.7	MDW 0840NHGS5	J94
	82.4	155.5	MDE 0840S09H08	J21
	82.6	155.7	MDW 0840HGS8	J45
8.5	24.8	83.5	MDE 0850S09E02	J14
	25.1	83.8	MDW 0850GS2	J41
	25.5	80.0	MDF 0850S2D	J28
	25.5	140.0	MDF 0850L2D	J32
	30.9	101.1	MDW 0850PHT	J82
	31.0	101.1	MDA 0850S10H03	J88
	31.3	101.5	MDE 0850S09H03	J21
	31.3	101.5	MDM 0850S09H03	J57
	31.3	101.5	MDW 0850HX3	J65
	31.6	99.8	MDW 0850SGS3	J75
	31.6	101.8	MDW 0850HGS3	J45
	31.6	101.8	MDW 0850HY3	J71
	31.6	101.8	MDW 0850NHGS3	J94
	34.0	100.0	MDF 0850H3D	J34
	41.8	99.5	MDE 0850S09E04	J14
	42.1	99.8	MDW 0850GS4	J41
	51.0	127.0	MDF 0850H5D	J34
	56.5	128.1	MDA 0850S10H05	J88
	56.8	128.5	MDE 0850S09H05	J21
	56.8	128.5	MDM 0850S09H05	J57
	56.8	128.5	MDW 0850HX5	J65
	57.1	128.8	MDW 0850HGS5	J45
	57.1	128.8	MDW 0850HY5	J71
	57.1	128.8	MDW 0850NHGS5	J94
	82.3	155.5	MDE 0850S09H08	J21
	82.3	155.5	MDW 0850HX8	J65
	82.6	155.8	MDW 0850HGS8	J45
	82.6	155.8	MDW 0850HY8	J71
	107.9	182.5	MDA 0850S10H10	J88
	108.1	182.8	MDW 0850NHGS10	J94
	116.8	186.5	MDW 0850XHGS10	J82
	131.8	201.5	MDW 0850XHGS12	J82

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø8.5 to ø8.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
8.5	156.8	226.5	MDW 0850XHGS15	J82
	199.8	269.5	MDW 0850XHGS20	J82
	241.8	311.5	MDW 0850XHGS25	J82
	284.8	354.5	MDW 0850XHGS30	J82
8.6	25.8	80.0	MDF 0860S2D	J28
	25.8	140.0	MDF 0860L2D	J32
	26.7	83.6	MDE 0860S09E02	J14
	26.9	83.8	MDW 0860GS2	J41
	31.2	101.1	MDA 0860S10H03	J88
	33.7	101.6	MDE 0860S09H03	J21
	33.7	101.6	MDM 0860S09H03	J57
	33.7	101.6	MDW 0860HX3	J65
	33.9	101.8	MDW 0860HGS3	J45
	33.9	101.8	MDW 0860HY3	J71
	33.9	101.8	MDW 0860NHGS3	J94
	34.4	100.0	MDF 0860H3D	J35
	43.7	99.6	MDE 0860S09E04	J14
	43.9	99.8	MDW 0860GS4	J41
	51.6	127.0	MDF 0860H5D	J35
	58.2	128.1	MDA 0860S10H05	J88
	60.7	128.6	MDE 0860S09H05	J21
	60.7	128.6	MDM 0860S09H05	J57
	60.7	128.6	MDW 0860HX5	J65
	60.9	128.8	MDW 0860HGS5	J45
	60.9	128.8	MDW 0860HY5	J71
	60.9	128.8	MDW 0860NHGS5	J94
	87.7	155.6	MDE 0860S09H08	J21
	87.9	155.8	MDW 0860HGS8	J45
8.7	26.1	80.0	MDF 0870S2D	J28
	26.1	140.0	MDF 0870L2D	J32
	26.6	83.6	MDE 0870S09E02	J14
	26.8	83.8	MDW 0870GS2	J41
	33.6	101.6	MDE 0870S09H03	J21
	33.6	101.6	MDM 0870S09H03	J57
	33.6	101.6	MDW 0870HX3	J65
	33.8	101.8	MDW 0870HGS3	J46
	34.8	100.0	MDF 0870H3D	J35
	43.6	99.6	MDE 0870S09E04	J14
	43.8	99.8	MDW 0870GS4	J41
	52.2	127.0	MDF 0870H5D	J35
	58.1	128.2	MDA 0870S10H05	J88
	60.6	128.6	MDE 0870S09H05	J21
	60.6	128.6	MDM 0870S09H05	J57
	60.6	128.6	MDW 0870HX5	J65
	60.8	128.8	MDW 0870HGS5	J46
	60.8	128.8	MDW 0870NHGS5	J94
	87.6	155.6	MDE 0870S09H08	J21
	87.8	155.8	MDW 0870HGS8	J46
8.8	26.4	80.0	MDF 0880S2D	J28
	26.4	83.6	MDE 0880S09E02	J14
	26.4	83.6	MDE 0880S09E02H	J17
	26.4	140.0	MDF 0880L2D	J32
	26.6	83.8	MDW 0880GS2	J41
	31.0	101.2	MDA 0880S10H03	J88
	33.4	101.6	MDE 0880S09H03	J21
	33.4	101.6	MDM 0880S09H03	J57
	33.4	101.6	MDW 0880HX3	J65
	33.6	101.8	MDW 0880HGS3	J46
	33.6	101.8	MDW 0880HY3	J71
	33.6	101.8	MDW 0880NHGS3	J94
	35.2	100.0	MDF 0880H3D	J35
	43.4	99.6	MDE 0880S09E04	J14
	43.6	99.8	MDW 0880GS4	J41
	52.8	127.0	MDF 0880H5D	J35
	58.0	128.2	MDA 0880S10H05	J88
	60.4	128.6	MDE 0880S09H05	J21
	60.4	128.6	MDM 0880S09H05	J57
	60.4	128.6	MDW 0880HX5	J65
	60.6	128.8	MDW 0880HGS5	J46
	60.6	128.8	MDW 0880HY5	J71
	60.6	128.8	MDW 0880NHGS5	J94
	87.4	155.6	MDE 0880S09H08	J21
	87.4	155.6	MDW 0880HX8	J65
	87.6	155.8	MDW 0880HGS8	J46
8.9	26.3	83.6	MDE 0890S09E02	J14
	26.5	83.8	MDW 0890GS2	J41
	26.7	80.0	MDF 0890S2D	J28
	26.7	140.0	MDF 0890L2D	J32
	33.3	101.6	MDE 0890S09H03	J21
	33.3	101.6	MDM 0890S09H03	J57

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø8.9 to ø9.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
8.9	33.3	101.6	MDW 0890HX3	J65
	33.5	101.8	MDW 0890HGS3	J46
	35.6	100.0	MDF 0890H3D	J35
	43.3	99.6	MDE 0890S09E04	J14
	43.5	99.8	MDW 0890GS4	J41
	53.4	127.0	MDF 0890H5D	J35
	57.8	128.2	MDA 0890S10H05	J88
	60.3	128.6	MDE 0890S09H05	J21
	60.3	128.6	MDM 0890S09H05	J57
	60.3	128.6	MDW 0890HX5	J65
	60.5	128.8	MDW 0890HGS5	J46
	60.5	128.8	MDW 0890NHGS5	J94
	87.3	155.6	MDE 0890S09H08	J21
	87.5	155.8	MDW 0890HGS8	J46
9.0	26.1	83.6	MDE 0900S09E02	J14
	26.4	83.9	MDW 0900GS2	J41
	27.0	80.0	MDF 0900S2D	J28
	27.0	140.0	MDF 0900L2D	J32
	30.7	101.2	MDA 0900S10H03	J88
	32.7	101.2	MDW 0900PHT	J82
	33.1	101.6	MDE 0900S09H03	J21
	33.1	101.6	MDM 0900S09H03	J57
	33.1	101.6	MDW 0900HX3	J65
	33.4	99.9	MDW 0900SGS3	J75
	33.4	101.9	MDW 0900HGS3	J46
	33.4	101.9	MDW 0900HY3	J71
	33.4	101.9	MDW 0900NHGS3	J94
	33.6	100.1	MDS 09000SDC3	J97
	36.0	100.0	MDF 0900H3D	J35
	43.1	99.6	MDE 0900S09E04	J14
	43.4	99.9	MDW 0900GS4	J41
	54.0	127.0	MDF 0900H5D	J35
	57.7	128.2	MDA 0900S10H05	J88
	60.1	128.6	MDE 0900S09H05	J21
	60.1	128.6	MDM 0900S09H05	J57
	60.1	128.6	MDW 0900HX5	J65
	60.4	128.9	MDW 0900HGS5	J46
	60.4	128.9	MDW 0900HY5	J71
	60.4	128.9	MDW 0900NHGS5	J94
	87.1	155.6	MDE 0900S09H08	J21
	87.1	155.6	MDW 0900HX8	J65
	87.4	155.9	MDW 0900HGS8	J46
	112.1	182.6	MDA 0900S10H10	J88
	114.4	182.9	MDW 0900NHGS10	J94
	123.1	191.6	MDW 0900XHGS10	J82
	141.1	209.6	MDW 0900XHGS12	J82
	168.1	236.6	MDW 0900XHGS15	J82
	213.1	281.6	MDW 0900XHGS20	J82
	258.1	326.6	MDW 0900XHGS25	J82
	303.1	371.6	MDW 0900XHGS30	J82
9.1	26.1	88.7	MDE 0910S10E02	J14
	26.3	88.9	MDW 0910GS2	J41
	27.3	80.0	MDF 0910S2D	J28
	27.3	150.0	MDF 0910L2D	J32
	35.6	107.7	MDE 0910S10H03	J21
	35.6	107.7	MDM 0910S10H03	J57
	35.6	107.7	MDW 0910HX3	J65
	35.8	107.9	MDW 0910HGS3	J46
	36.4	106.0	MDF 0910H3D	J35
	46.1	106.7	MDE 0910S10E04	J14
	46.3	106.9	MDW 0910GS4	J41
	54.6	136.0	MDF 0910H5D	J35
	63.6	137.2	MDA 0910S10H05	J89
	64.1	137.7	MDE 0910S10H05	J21
	64.1	137.7	MDM 0910S10H05	J57
	64.1	137.7	MDW 0910HX5	J65
	64.3	137.9	MDW 0910HGS5	J46
	64.3	137.9	MDW 0910NHGS5	J94
	92.6	167.7	MDE 0910S10H08	J21
	92.8	167.9	MDW 0910HGS8	J46
9.2	25.9	88.7	MDE 0920S10E02	J15
	26.1	88.9	MDW 0920GS2	J41
	27.6	80.0	MDF 0920S2D	J28
	27.6	150.0	MDF 0920L2D	J32
	35.4	107.7	MDE 0920S10H03	J21
	35.4	107.7	MDM 0920S10H03	J57
	35.4	107.7	MDW 0920HX3	J65
	35.6	107.9	MDW 0920HGS3	J46
	36.8	106.0	MDF 0920H3D	J35
	45.9	106.7	MDE 0920S10E04	J15

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø9.2 to ø9.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
9.2	46.1	106.9	MDW 0920GS4	J41
	55.2	136.0	MDF 0920H5D	J35
	63.4	137.2	MDA 0920S10H05	J89
	63.9	137.7	MDE 0920S10H05	J21
	63.9	137.7	MDM 0920S10H05	J57
	63.9	137.7	MDW 0920HX5	J65
	64.1	137.9	MDW 0920HGS5	J46
	64.1	137.9	MDW 0920NHGS5	J94
	92.4	167.7	MDE 0920S10H08	J21
	92.6	167.9	MDW 0920HGS8	J46
9.21	35.6	107.9	MDW 0921NHGS3	J94
	63.3	137.2	MDA 0921S10H05	J89
	64.1	137.9	MDW 0921NHGS5	J94
9.24	25.8	88.7	MDE 0924S10E02	J15
	27.7	80.0	MDF 0924S2D	J28
	63.8	137.7	MDE 0924S10H05	J22
9.26	25.8	88.7	MDE 0926S10E02	J15
	27.7	80.0	MDF 0926S2D	J28
	63.8	137.7	MDE 0926S10H05	J22
9.3	25.8	88.7	MDE 0930S10E02	J15
	26.0	88.9	MDW 0930GS2	J41
	27.9	80.0	MDF 0930S2D	J28
	27.9	150.0	MDF 0930L2D	J32
	35.3	107.7	MDE 0930S10H03	J22
	35.3	107.7	MDM 0930S10H03	J57
	35.3	107.7	MDW 0930HX3	J65
	35.5	107.9	MDW 0930HGS3	J46
	37.2	106.0	MDF 0930H3D	J35
	45.8	106.7	MDE 0930S10E04	J15
	46.0	106.9	MDW 0930GS4	J41
	55.8	136.0	MDF 0930H5D	J35
	63.3	137.2	MDA 0930S10H05	J89
	63.8	137.7	MDE 0930S10H05	J22
	63.8	137.7	MDM 0930S10H05	J57
	63.8	137.7	MDW 0930HX5	J65
	64.0	137.9	MDW 0930HGS5	J46
	64.0	137.9	MDW 0930NHGS5	J94
	92.3	167.7	MDE 0930S10H08	J22
	92.5	167.9	MDW 0930HGS8	J46
	120.7	197.7	MDA 0930S10H10	J89
9.36	25.6	88.7	MDE 0936S10E02	J15
	28.0	80.0	MDF 0936S2D	J28
	63.6	137.7	MDE 0936S10H05	J22
9.38	25.6	88.7	MDE 0938S10E02	J15
	28.1	80.0	MDF 0938S2D	J28
	63.6	137.7	MDE 0938S10H05	J22
9.4	25.6	88.7	MDE 0940S10E02	J15
	25.8	88.9	MDW 0940GS2	J41
	28.2	80.0	MDF 0940S2D	J28
	28.2	150.0	MDF 0940L2D	J32
	34.7	107.3	MDA 0940S10H03	J89
	35.1	107.7	MDE 0940S10H03	J22
	35.1	107.7	MDM 0940S10H03	J57
	35.1	107.7	MDW 0940HX3	J65
	35.3	107.9	MDW 0940HGS3	J46
	35.3	107.9	MDW 0940NHGS3	J94
	37.6	106.0	MDF 0940H3D	J35
	45.6	106.7	MDE 0940S10E04	J15
	45.8	106.9	MDW 0940GS4	J41
	56.4	136.0	MDF 0940H5D	J35
	63.2	137.3	MDA 0940S10H05	J89
	63.6	137.7	MDE 0940S10H05	J22
	63.6	137.7	MDM 0940S10H05	J57
	63.6	137.7	MDW 0940HX5	J65
	63.8	137.9	MDW 0940HGS5	J46
	63.8	137.9	MDW 0940NHGS5	J94
	92.1	167.7	MDE 0940S10H08	J22
	92.3	167.9	MDW 0940HGS8	J46
9.5	25.5	88.7	MDE 0950S10E02	J15
	25.8	89.0	MDW 0950GS2	J41
	28.5	80.0	MDF 0950S2D	J28
	28.5	150.0	MDF 0950L2D	J32
	34.5	107.3	MDA 0950S10H03	J89
	34.6	107.3	MDW 0950PHT	J82
	35.0	107.7	MDE 0950S10H03	J22
	35.0	107.7	MDM 0950S10H03	J57
	35.0	107.7	MDW 0950HX3	J65
	35.3	107.0	MDW 0950SGS3	J75
	35.3	108.0	MDW 0950HGS3	J46
	35.3	108.0	MDW 0950HY3	J71

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø9.5 to ø9.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
9.5	35.3	108.0	MDW 0950NHGS3	J94
	38.0	106.0	MDF 0950H3D	J35
	45.5	106.7	MDE 0950S10E04	J15
	45.8	107.0	MDW 0950GS4	J41
	57.0	136.0	MDF 0950H5D	J35
	63.0	137.3	MDA 0950S10H05	J89
	63.5	137.7	MDE 0950S10H05	J22
	63.5	137.7	MDM 0950S10H05	J57
	63.5	137.7	MDW 0950HX5	J65
	63.8	138.0	MDW 0950HGS5	J46
	63.8	138.0	MDW 0950HY5	J71
	63.8	138.0	MDW 0950NHGS5	J94
	92.0	167.7	MDE 0950S10H08	J22
	92.0	167.7	MDW 0950HX8	J65
	92.3	168.0	MDW 0950HGS8	J46
	120.5	197.7	MDA 0950S10H10	J89
	120.8	198.0	MDW 0950NHGS10	J94
	130.5	202.7	MDW 0950XHGS10	J82
	147.5	219.7	MDW 0950XHGS12	J82
	175.5	247.7	MDW 0950XHGS15	J82
	223.5	295.7	MDW 0950XHGS20	J82
	270.5	342.7	MDW 0950XHGS25	J82
	318.5	390.7	MDW 0950XHGS30	J82
9.52	28.3	88.7	MDE 0952S10E02	J15
	28.5	80.0	MDF 0952S2D	J28
	67.3	137.7	MDE 0952S10H05	J22
9.54	28.3	88.7	MDE 0954S10E02	J15
	28.6	80.0	MDF 0954S2D	J29
	67.3	137.7	MDE 0954S10H05	J22
9.55	37.9	107.2	MDS 09550SDC3	J97
9.6	28.3	88.7	MDE 0960S10E02	J15
	28.6	89.0	MDW 0960GS2	J41
	28.8	80.0	MDF 0960S2D	J29
	28.8	150.0	MDF 0960L2D	J32
	36.9	107.3	MDA 0960S10H03	J89
	37.3	107.7	MDE 0960S10H03	J22
	37.3	107.7	MDM 0960S10H03	J57
	37.3	107.7	MDW 0960HX3	J65
	37.6	108.0	MDW 0960HGS3	J46
	38.4	106.0	MDF 0960H3D	J35
	47.3	106.7	MDE 0960S10E04	J15
	47.6	107.0	MDW 0960GS4	J41
	57.6	136.0	MDF 0960H5D	J35
	66.9	137.3	MDA 0960S10H05	J89
	67.3	137.7	MDE 0960S10H05	J22
	67.3	137.7	MDM 0960S10H05	J57
	67.3	137.7	MDW 0960HX5	J65
	67.6	138.0	MDW 0960HGS5	J46
	67.6	138.0	MDW 0960NHGS5	J94
	97.3	167.7	MDE 0960S10H08	J22
	97.6	168.0	MDW 0960HGS8	J46
9.7	28.3	88.8	MDE 0970S10E02	J15
	28.5	89.0	MDW 0970GS2	J41
	29.1	80.0	MDF 0970S2D	J29
	29.1	150.0	MDF 0970L2D	J32
	37.3	107.8	MDE 0970S10H03	J22
	37.3	107.8	MDM 0970S10H03	J57
	37.3	107.8	MDW 0970HX3	J65
	37.5	108.0	MDW 0970HGS3	J46
	38.8	106.0	MDF 0970H3D	J35
	47.3	106.8	MDE 0970S10E04	J15
	47.5	107.0	MDW 0970GS4	J41
	58.2	136.0	MDF 0970H5D	J35
	67.3	137.8	MDE 0970S10H05	J22
	67.3	137.8	MDM 0970S10H05	J57
	67.3	137.8	MDW 0970HX5	J65
	67.5	138.0	MDW 0970HGS5	J46
	67.5	138.0	MDW 0970NHGS5	J94
	97.3	167.8	MDE 0970S10H08	J22
	97.5	168.0	MDW 0970HGS8	J46
9.8	28.1	88.8	MDE 0980S10E02	J15
	28.3	89.0	MDW 0980GS2	J41
	29.4	80.0	MDF 0980S2D	J29
	29.4	150.0	MDF 0980L2D	J32
	37.1	107.8	MDE 0980S10H03	J22
	37.1	107.8	MDM 0980S10H03	J57
	37.1	107.8	MDW 0980HX3	J65
	37.3	108.0	MDW 0980HGS3	J46
	39.2	106.0	MDF 0980H3D	J35
	47.1	106.8	MDE 0980S10E04	J15

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø9.8 to ø10.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
9.8	47.3	107.0	MDW 0980GS4	J41
	58.8	136.0	MDF 0980H5D	J35
	66.6	137.3	MDA 0980S10H05	J89
	67.1	137.8	MDE 0980S10H05	J22
	67.1	137.8	MDM 0980S10H05	J57
	67.1	137.8	MDW 0980HX5	J65
	67.3	138.0	MDW 0980HGS5	J46
	67.3	138.0	MDW 0980NHGS5	J95
	97.1	167.8	MDE 0980S10H08	J22
	97.3	168.0	MDW 0980HGS8	J46
	127.1	197.8	MDA 0980S10H10	J89
	127.3	198.0	MDW 0980NHGS10	J95
9.9	28.0	88.8	MDE 0990S10E02	J15
	28.2	89.0	MDW 0990GS2	J41
	29.7	80.0	MDF 0990S2D	J29
	29.7	150.0	MDF 0990L2D	J32
	37.0	107.8	MDE 0990S10H03	J22
	37.0	107.8	MDM 0990S10H03	J57
	37.0	107.8	MDW 0990HX3	J65
	37.2	108.0	MDW 0990HGS3	J46
	39.6	106.0	MDF 0990H3D	J35
	47.0	106.8	MDE 0990S10E04	J15
	47.2	107.0	MDW 0990GS4	J41
	59.4	136.0	MDF 0990H5D	J35
	67.0	137.8	MDE 0990S10H05	J22
	67.0	137.8	MDM 0990S10H05	J57
	67.0	137.8	MDW 0990HX5	J65
	67.2	138.0	MDW 0990HGS5	J46
	67.2	138.0	MDW 0990NHGS5	J95
	97.0	167.8	MDE 0990S10H08	J22
	97.2	168.0	MDW 0990HGS8	J46
10.0	27.8	88.8	MDE 1000S10E02	J15
	27.8	88.8	MDE 1000S10E02H	J17
	28.1	89.1	MDW 1000GS2	J41
	30.0	80.0	MDF 1000S2D	J29
	30.0	150.0	MDF 1000L2D	J32
	30.0	150.0	MDF 1000L2D-S8	J32
	36.3	107.3	MDA 1000S10H03	J89
	36.3	107.3	MDW 1000PHT	J82
	36.8	107.8	MDE 1000S10H03	J22
	36.8	107.8	MDM 1000S10H03	J57
	36.8	107.8	MDW 1000HX3	J65
	37.1	107.1	MDW 1000SGS3	J75
	37.1	108.1	MDW 1000HGS3	J46
	37.1	108.1	MDW 1000HY3	J71
	37.1	108.1	MDW 1000NHGS3	J95
	37.3	107.3	MDS 10000SDC3	J97
	40.0	106.0	MDF 1000H3D	J35
	46.8	106.8	MDE 1000S10E04	J15
	47.1	107.1	MDW 1000GS4	J41
	60.0	136.0	MDF 1000H5D	J35
	66.3	137.3	MDA 1000S10H05	J89
	66.8	137.8	MDE 1000S10H05	J22
	66.8	137.8	MDM 1000S10H05	J57
	66.8	137.8	MDW 1000HX5	J65
	67.1	138.1	MDW 1000HGS5	J46
	67.1	138.1	MDW 1000HY5	J71
	67.1	138.1	MDW 1000NHGS5	J95
	96.8	167.8	MDE 1000S10H08	J22
	96.8	167.8	MDW 1000HX8	J65
	97.1	168.1	MDW 1000HGS8	J46
	126.8	197.8	MDA 1000S10H10	J89
	127.1	198.1	MDW 1000NHGS10	J95
	136.8	207.8	MDW 1000XHGS10	J82
	156.8	227.8	MDW 1000XHGS12	J82
	186.8	257.8	MDW 1000XHGS15	J82
	236.8	307.8	MDW 1000XHGS20	J82
	286.8	357.8	MDW 1000XHGS25	J82
	336.8	407.8	MDW 1000XHGS30	J82
10.1	27.7	94.8	MDE 1010S11E02	J15
	28.0	95.1	MDW 1010GS2	J41
	30.3	90.0	MDF 1010S2D	J29
	30.3	160.0	MDF 1010L2D	J32
	38.7	117.3	MDA 1010S12H03	J89
	39.2	117.8	MDE 1010S11H03	J22
	39.2	117.8	MDM 1010S11H03	J57
	39.2	117.8	MDW 1010HX3	J65
	39.5	118.1	MDW 1010HGS3	J46
	39.5	118.1	MDW 1010NHGS3	J95
	40.4	116.0	MDF 1010H3D	J35

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø10.1 to ø10.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
10.1	52.7	115.8	MDE 1010S11E04	J15
	53.0	116.1	MDW 1010GS4	J41
	60.6	149.0	MDF 1010H5D	J35
	70.2	150.3	MDA 1010S12H05	J89
	70.7	150.8	MDE 1010S11H05	J22
	70.7	150.8	MDM 1010S11H05	J57
	70.7	150.8	MDW 1010HX5	J65
	71.0	151.1	MDW 1010HGS5	J46
	102.2	183.8	MDE 1010S11H08	J22
	102.5	184.1	MDW 1010HGS8	J46
10.2	27.6	94.9	MDE 1020S11E02	J15
	27.8	95.1	MDW 1020GS2	J41
	30.6	90.0	MDF 1020S2D	J29
	30.6	160.0	MDF 1020L2D	J32
	39.1	117.9	MDE 1020S11H03	J22
	39.1	117.9	MDM 1020S11H03	J57
	39.1	117.9	MDW 1020HX3	J66
	39.3	118.1	MDW 1020HGS3	J46
	39.3	118.1	MDW 1020HY3	J71
	40.8	116.0	MDF 1020H3D	J35
	52.6	115.9	MDE 1020S11E04	J15
	52.8	116.1	MDW 1020GS4	J41
	61.2	149.0	MDF 1020H5D	J35
	70.6	150.9	MDE 1020S11H05	J22
	70.6	150.9	MDM 1020S11H05	J57
	70.6	150.9	MDW 1020HX5	J66
	70.8	151.1	MDW 1020HGS5	J46
	70.8	151.1	MDW 1020HY5	J71
	102.1	183.9	MDE 1020S11H08	J22
	102.3	184.1	MDW 1020HGS8	J46
10.3	27.5	94.9	MDE 1030S11E02	J15
	27.7	95.1	MDW 1030GS2	J41
	30.9	90.0	MDF 1030S2D	J29
	30.9	160.0	MDF 1030L2D	J32
	38.6	117.4	MDA 1030S12H03	J89
	39.0	117.9	MDE 1030S11H03	J22
	39.0	117.9	MDM 1030S11H03	J57
	39.0	117.9	MDW 1030HX3	J66
	39.2	118.1	MDW 1030HGS3	J46
	39.2	118.1	MDW 1030HY3	J71
	39.2	118.1	MDW 1030NHGS3	J95
	41.2	116.0	MDF 1030H3D	J35
	52.5	115.9	MDE 1030S11E04	J15
	52.7	116.1	MDW 1030GS4	J41
	61.8	149.0	MDF 1030H5D	J35
	70.1	150.4	MDA 1030S12H05	J89
	70.5	150.9	MDE 1030S11H05	J22
	70.5	150.9	MDM 1030S11H05	J57
	70.5	150.9	MDW 1030HX5	J66
	70.7	151.1	MDW 1030HGS5	J46
	70.7	151.1	MDW 1030HY5	J71
	70.7	151.1	MDW 1030NHGS5	J95
	102.0	183.9	MDE 1030S11H08	J22
	102.0	183.9	MDW 1030HX8	J66
	102.2	184.1	MDW 1030HGS8	J46
	102.2	184.1	MDW 1030HY8	J71
10.4	27.3	94.9	MDE 1040S11E02	J15
	27.6	95.2	MDW 1040GS2	J41
	31.2	90.0	MDF 1040S2D	J29
	31.2	160.0	MDF 1040L2D	J32
	38.3	117.4	MDA 1040S12H03	J89
	38.8	117.9	MDE 1040S11H03	J22
	38.8	117.9	MDM 1040S11H03	J57
	38.8	117.9	MDW 1040HX3	J66
	39.1	118.2	MDW 1040HGS3	J46
	41.6	116.0	MDF 1040H3D	J35
	52.3	115.9	MDE 1040S11E04	J15
	52.6	116.2	MDW 1040GS4	J41
	62.4	149.0	MDF 1040H5D	J35
	69.8	150.4	MDA 1040S12H05	J89
	70.3	150.9	MDE 1040S11H05	J22
	70.3	150.9	MDM 1040S11H05	J57
	70.3	150.9	MDW 1040HX5	J66
	70.6	151.2	MDW 1040HGS5	J46
	70.6	151.2	MDW 1040NHGS5	J95
	101.8	183.9	MDE 1040S11H08	J22
	102.1	184.2	MDW 1040HGS8	J46
10.5	27.2	94.9	MDE 1050S11E02	J15
	27.5	95.2	MDW 1050GS2	J41
	31.5	90.0	MDF 1050S2D	J29

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø10.5 to ø10.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
10.5	31.5	160.0	MDF 1050L2D	J32
	38.2	117.4	MDA 1050S12H03	J89
	38.2	117.4	MDW 1050PHT	J82
	38.7	117.9	MDE 1050S11H03	J22
	38.7	117.9	MDM 1050S11H03	J57
	38.7	117.9	MDW 1050HX3	J66
	39.0	116.2	MDW 1050SGS3	J75
	39.0	118.2	MDW 1050HGS3	J46
	39.0	118.2	MDW 1050NHGS3	J95
	42.0	116.0	MDF 1050H3D	J35
	52.2	115.9	MDE 1050S11E04	J15
	52.5	116.2	MDW 1050GS4	J41
	63.0	149.0	MDF 1050H5D	J35
	69.7	150.4	MDA 1050S12H05	J89
	70.2	150.9	MDE 1050S11H05	J22
	70.2	150.9	MDM 1050S11H05	J57
	70.2	150.9	MDW 1050HX5	J66
	70.5	151.2	MDW 1050HGS5	J46
	70.5	151.2	MDW 1050NHGS5	J95
	101.7	183.9	MDE 1050S11H08	J22
	101.7	183.9	MDW 1050HX8	J66
	102.0	184.2	MDW 1050HGS8	J46
	133.2	216.9	MDA 1050S12H10	J89
	133.5	217.2	MDW 1050NHGS10	J95
	144.2	222.9	MDW 1050XHGS10	J82
	163.2	241.9	MDW 1050XHGS12	J82
	194.2	272.9	MDW 1050XHGS15	J82
	247.2	325.9	MDW 1050XHGS20	J82
	299.2	377.9	MDW 1050XHGS25	J82
10.6	31.0	94.9	MDE 1060S11E02	J15
	31.3	95.2	MDW 1060GS2	J41
	31.8	90.0	MDF 1060S2D	J29
	31.8	160.0	MDF 1060L2D	J32
	38.5	117.4	MDA 1060S12H03	J89
	41.0	117.9	MDE 1060S11H03	J22
	41.0	117.9	MDM 1060S11H03	J57
	41.0	117.9	MDW 1060HX3	J66
	41.3	118.2	MDW 1060HGS3	J46
	41.3	118.2	MDW 1060NHGS3	J95
	42.4	116.0	MDF 1060H3D	J35
	54.0	115.9	MDE 1060S11E04	J15
	54.3	116.2	MDW 1060GS4	J41
	63.6	149.0	MDF 1060H5D	J35
	71.5	150.4	MDA 1060S12H05	J89
	74.0	150.9	MDE 1060S11H05	J22
	74.0	150.9	MDM 1060S11H05	J57
	74.0	150.9	MDW 1060HX5	J66
	74.3	151.2	MDW 1060HGS5	J46
	74.3	151.2	MDW 1060NHGS5	J95
	107.0	183.9	MDE 1060S11H08	J22
	107.3	184.2	MDW 1060HGS8	J46
10.7	30.9	94.9	MDE 1070S11E02	J15
	31.2	95.2	MDW 1070GS2	J41
	32.1	90.0	MDF 1070S2D	J29
	32.1	160.0	MDF 1070L2D	J32
	40.9	117.9	MDE 1070S11H03	J22
	40.9	117.9	MDM 1070S11H03	J57
	40.9	117.9	MDW 1070HX3	J66
	41.2	118.2	MDW 1070HGS3	J46
	42.8	116.0	MDF 1070H3D	J35
	53.9	115.9	MDE 1070S11E04	J15
	54.2	116.2	MDW 1070GS4	J41
	64.2	149.0	MDF 1070H5D	J35
	73.9	150.9	MDE 1070S11H05	J22
	73.9	150.9	MDM 1070S11H05	J57
	73.9	150.9	MDW 1070HX5	J66
	74.2	151.2	MDW 1070HGS5	J46
	106.9	183.9	MDE 1070S11H08	J22
	107.2	184.2	MDW 1070HGS8	J46
10.8	30.8	95.0	MDE 1080S11E02	J15
	30.8	95.0	MDE 1080S11E02H	J17
	31.0	95.2	MDW 1080GS2	J41
	32.4	90.0	MDF 1080S2D	J29
	32.4	160.0	MDF 1080L2D	J32
	40.8	118.0	MDE 1080S11H03	J22
	40.8	118.0	MDM 1080S11H03	J57
	40.8	118.0	MDW 1080HX3	J66
	41.0	118.2	MDW 1080HGS3	J46
	43.2	116.0	MDF 1080H3D	J35
	53.8	116.0	MDE 1080S11E04	J15

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø10.8 to ø11.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
10.8	54.0	116.2	MDW 1080GS4	J41
	64.8	149.0	MDF 1080H5D	J35
	71.2	150.4	MDA 1080S12H05	J89
	73.8	151.0	MDE 1080S11H05	J22
	73.8	151.0	MDM 1080S11H05	J57
	73.8	151.0	MDW 1080HX5	J66
	74.0	151.2	MDW 1080HGS5	J46
	106.8	184.0	MDE 1080S11H08	J22
	107.0	184.2	MDW 1080HGS8	J46
	137.8	217.0	MDA 1080S12H10	J89
10.9	30.7	95.0	MDE 1090S11E02	J15
	31.0	95.3	MDW 1090GS2	J41
	32.7	90.0	MDF 1090S2D	J29
	32.7	160.0	MDF 1090L2D	J32
	40.7	118.0	MDE 1090S11H03	J22
	40.7	118.0	MDM 1090S11H03	J57
	40.7	118.0	MDW 1090HX3	J66
	41.0	118.3	MDW 1090HGS3	J46
	43.6	116.0	MDF 1090H3D	J35
	53.7	116.0	MDE 1090S11E04	J15
	54.0	116.3	MDW 1090GS4	J41
	65.4	149.0	MDF 1090H5D	J35
	73.7	151.0	MDE 1090S11H05	J22
	73.7	151.0	MDM 1090S11H05	J57
	73.7	151.0	MDW 1090HX5	J66
	74.0	151.3	MDW 1090HGS5	J46
	106.7	184.0	MDE 1090S11H08	J22
	107.0	184.3	MDW 1090HGS8	J46
11.0	30.5	95.0	MDE 1100S11E02	J15
	30.8	95.3	MDW 1100GS2	J41
	33.0	90.0	MDF 1100S2D	J29
	33.0	160.0	MDF 1100L2D	J32
	38.0	117.5	MDA 1100S12H03	J89
	40.0	117.5	MDW 1100PHT	J82
	40.5	118.0	MDE 1100S11H03	J22
	40.5	118.0	MDM 1100S11H03	J58
	40.5	118.0	MDW 1100HX3	J66
	40.8	116.3	MDW 1100SGS3	J75
	40.8	118.3	MDW 1100HGS3	J46
	40.8	118.3	MDW 1100HY3	J71
	40.8	118.3	MDW 1100NHGS3	J95
	44.0	116.0	MDF 1100H3D	J35
	53.5	116.0	MDE 1100S11E04	J15
	53.8	116.3	MDW 1100GS4	J41
	66.0	149.0	MDF 1100H5D	J35
	71.0	150.5	MDA 1100S12H05	J89
	73.5	151.0	MDE 1100S11H05	J22
	73.5	151.0	MDM 1100S11H05	J58
	73.5	151.0	MDW 1100HX5	J66
	73.8	151.3	MDW 1100HGS5	J46
	73.8	151.3	MDW 1100HY5	J71
	73.8	151.3	MDW 1100NHGS5	J95
	106.5	184.0	MDE 1100S11H08	J22
	106.5	184.0	MDW 1100HX8	J66
	106.8	184.3	MDW 1100HGS8	J46
	137.5	217.0	MDA 1100S12H10	J89
	139.8	217.3	MDW 1100NHGS10	J95
	150.5	228.0	MDW 1100XHGS10	J82
	172.5	250.0	MDW 1100XHGS12	J82
	205.5	283.0	MDW 1100XHGS15	J82
	260.5	338.0	MDW 1100XHGS20	J82
	315.5	393.0	MDW 1100XHGS25	J82
11.08	43.2	124.3	MDW 1108NHGS3	J95
	77.7	160.3	MDW 1108NHGS5	J95
11.1	30.4	102.0	MDE 1110S12E02	J15
	30.7	102.3	MDW 1110GS2	J41
	33.3	90.0	MDF 1110S2D	J29
	33.3	170.0	MDF 1110L2D	J32
	42.3	123.5	MDA 1110S12H03	J89
	42.9	124.0	MDE 1110S12H03	J22
	42.9	124.0	MDM 1110S12H03	J58
	42.9	124.0	MDW 1110HX3	J66
	43.2	124.3	MDW 1110HGS3	J46
	43.2	124.3	MDW 1110NHGS3	J95
	44.4	122.0	MDF 1110H3D	J35
	56.4	123.0	MDE 1110S12E04	J15
	56.7	123.3	MDW 1110GS4	J41
	66.6	158.0	MDF 1110H5D	J35
	76.8	159.5	MDA 1110S12H05	J89
	77.4	160.0	MDE 1110S12H05	J22

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø11.1 to ø11.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
11.1	77.4	160.0	MDM 1110S12H05	J58
	77.4	160.0	MDW 1110HX5	J66
	77.7	160.3	MDW 1110HGS5	J46
	77.7	160.3	MDW 1110NHGS5	J95
	111.9	196.0	MDE 1110S12H08	J22
	112.2	196.3	MDW 1110HGS8	J46
11.2	30.2	102.0	MDE 1120S12E02	J15
	30.5	102.3	MDW 1120GS2	J41
	33.6	90.0	MDF 1120S2D	J29
	33.6	160.0	MDF 1120L2D	J32
	42.7	124.0	MDE 1120S12H03	J22
	42.7	124.0	MDM 1120S12H03	J58
	42.7	124.0	MDW 1120HX3	J66
	43.0	124.3	MDW 1120HGS3	J46
	43.0	124.3	MDW 1120NHGS3	J95
	44.8	122.0	MDF 1120H3D	J35
	56.2	123.0	MDE 1120S12E04	J15
	56.5	123.3	MDW 1120GS4	J41
	67.2	158.0	MDF 1120H5D	J35
	76.7	159.5	MDA 1120S12H05	J89
	77.2	160.0	MDE 1120S12H05	J22
	77.2	160.0	MDM 1120S12H05	J58
	77.2	160.0	MDW 1120HX5	J66
	77.5	160.3	MDW 1120HGS5	J46
	77.5	160.3	MDW 1120NHGS5	J95
	111.7	196.0	MDE 1120S12H08	J22
	112.0	196.3	MDW 1120HGS8	J46
11.22	30.2	102.0	MDE 1122S12E02	J15
	33.6	90.0	MDF 1122S2D	J29
	77.2	160.0	MDE 1122S12H05	J22
11.24	30.2	102.0	MDE 1124S12E02	J15
	33.7	90.0	MDF 1124S2D	J29
	77.2	160.0	MDE 1124S12H05	J22
11.3	30.2	102.1	MDE 1130S12E02	J15
	30.4	102.3	MDW 1130GS2	J41
	33.9	90.0	MDF 1130S2D	J29
	33.9	160.0	MDF 1130L2D	J32
	42.7	124.1	MDE 1130S12H03	J22
	42.7	124.1	MDM 1130S12H03	J58
	42.7	124.1	MDW 1130HX3	J66
	42.9	124.3	MDW 1130HGS3	J46
	45.2	122.0	MDF 1130H3D	J35
	56.2	123.1	MDE 1130S12E04	J15
	56.4	123.3	MDW 1130GS4	J41
	67.8	158.0	MDF 1130H5D	J35
	77.2	160.1	MDE 1130S12H05	J22
	77.2	160.1	MDM 1130S12H05	J58
	77.2	160.1	MDW 1130HX5	J66
	77.4	160.3	MDW 1130HGS5	J46
	111.7	196.1	MDE 1130S12H08	J22
	111.9	196.3	MDW 1130HGS8	J46
11.36	30.0	102.1	MDE 1136S12E02	J15
	34.0	90.0	MDF 1136S2D	J29
	77.0	160.1	MDE 1136S12H05	J22
11.38	30.0	102.1	MDE 1138S12E02	J15
	34.1	90.0	MDF 1138S2D	J29
	77.0	160.1	MDE 1138S12H05	J22
11.4	30.0	102.1	MDE 1140S12E02	J15
	30.3	102.4	MDW 1140GS2	J41
	34.2	90.0	MDF 1140S2D	J29
	34.2	160.0	MDF 1140L2D	J32
	42.5	124.1	MDE 1140S12H03	J22
	42.5	124.1	MDM 1140S12H03	J58
	42.5	124.1	MDW 1140HX3	J66
	42.8	124.4	MDW 1140HGS3	J46
	42.8	124.4	MDW 1140HY3	J71
	42.8	124.4	MDW 1140NHGS3	J95
	45.6	122.0	MDF 1140H3D	J35
	56.0	123.1	MDE 1140S12E04	J15
	56.3	123.4	MDW 1140GS4	J41
	68.4	158.0	MDF 1140H5D	J35
	76.4	159.5	MDA 1140S12H05	J89
	77.0	160.1	MDE 1140S12H05	J22
	77.0	160.1	MDM 1140S12H05	J58
	77.0	160.1	MDW 1140HX5	J66
	77.3	160.4	MDW 1140HGS5	J46
	77.3	160.4	MDW 1140HY5	J71
	77.3	160.4	MDW 1140NHGS5	J95
	111.5	196.1	MDE 1140S12H08	J22
	111.8	196.4	MDW 1140HGS8	J46

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø11.5 to ø11.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
11.5	29.9	102.1	MDE 1150S12E02	J15
	30.2	102.4	MDW 1150GS2	J41
	34.5	90.0	MDF 1150S2D	J29
	34.5	160.0	MDF 1150L2D	J32
	41.8	123.5	MDA 1150S12H03	J89
	41.8	123.5	MDW 1150PHT	J82
	42.4	124.1	MDE 1150S12H03	J22
	42.4	124.1	MDM 1150S12H03	J58
	42.4	124.1	MDW 1150HX3	J66
	42.7	123.4	MDW 1150SGS3	J75
	42.7	124.4	MDW 1150HGS3	J46
	42.7	124.4	MDW 1150HY3	J71
	42.7	124.4	MDW 1150NHGS3	J95
	46.0	122.0	MDF 1150H3D	J35
	55.9	123.1	MDE 1150S12E04	J15
	56.2	123.4	MDW 1150GS4	J41
	69.0	158.0	MDF 1150H5D	J35
	76.3	159.5	MDA 1150S12H05	J89
	76.9	160.1	MDE 1150S12H05	J22
	76.9	160.1	MDM 1150S12H05	J58
	76.9	160.1	MDW 1150HX5	J66
	77.2	160.4	MDW 1150HGS5	J46
	77.2	160.4	MDW 1150HY5	J71
	77.2	160.4	MDW 1150NHGS5	J95
	111.4	196.1	MDE 1150S12H08	J22
	111.4	196.1	MDW 1150HX8	J66
	111.7	196.4	MDW 1150HGS8	J46
	145.8	232.1	MDA 1150S12H10	J89
	146.2	232.4	MDW 1150NHGS10	J95
	157.9	239.1	MDW 1150XHGS10	J82
	178.9	260.1	MDW 1150XHGS12	J82
	212.9	294.1	MDW 1150XHGS15	J82
	270.9	352.1	MDW 1150XHGS20	J82
	327.9	409.1	MDW 1150XHGS25	J82
11.6	31.7	102.1	MDE 1160S12E02	J15
	32.0	102.4	MDW 1160GS2	J41
	34.8	90.0	MDF 1160S2D	J29
	34.8	160.0	MDF 1160L2D	J32
	44.7	124.1	MDE 1160S12H03	J22
	44.7	124.1	MDM 1160S12H03	J58
	44.7	124.1	MDW 1160HX3	J66
	45.0	124.4	MDW 1160HGS3	J46
	46.4	122.0	MDF 1160H3D	J35
	57.7	123.1	MDE 1160S12E04	J15
	58.0	123.4	MDW 1160GS4	J41
	69.6	158.0	MDF 1160H5D	J35
	80.7	160.1	MDE 1160S12H05	J22
	80.7	160.1	MDM 1160S12H05	J58
	80.7	160.1	MDW 1160HX5	J66
	81.0	160.4	MDW 1160HGS5	J46
	116.7	196.1	MDE 1160S12H08	J22
	117.0	196.4	MDW 1160HGS8	J46
11.7	31.6	102.1	MDE 1170S12E02	J15
	31.9	102.4	MDW 1170GS2	J41
	35.1	90.0	MDF 1170S2D	J29
	35.1	160.0	MDF 1170L2D	J32
	44.6	124.1	MDE 1170S12H03	J22
	44.6	124.1	MDM 1170S12H03	J58
	44.6	124.1	MDW 1170HX3	J66
	44.9	124.4	MDW 1170HGS3	J46
	46.8	122.0	MDF 1170H3D	J35
	57.6	123.1	MDE 1170S12E04	J15
	57.9	123.4	MDW 1170GS4	J41
	70.2	158.0	MDF 1170H5D	J35
	80.6	160.1	MDE 1170S12H05	J22
	80.6	160.1	MDM 1170S12H05	J58
	80.6	160.1	MDW 1170HX5	J66
	80.9	160.4	MDW 1170HGS5	J46
	116.6	196.1	MDE 1170S12H08	J22
	116.9	196.4	MDW 1170HGS8	J46
11.8	31.4	102.1	MDE 1180S12E02	J15
	31.7	102.4	MDW 1180GS2	J41
	35.4	90.0	MDF 1180S2D	J29
	35.4	160.0	MDF 1180L2D	J32
	44.4	124.1	MDE 1180S12H03	J23
	44.4	124.1	MDM 1180S12H03	J58
	44.4	124.1	MDW 1180HX3	J66
	44.7	124.4	MDW 1180HGS3	J46
	47.2	122.0	MDF 1180H3D	J35
	57.4	123.1	MDE 1180S12E04	J15

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø11.8 to ø12.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
11.8	57.7	123.4	MDW 1180GS4	J41
	70.8	158.0	MDF 1180H5D	J35
	79.9	159.6	MDA 1180S12H05	J89
	80.4	160.1	MDE 1180S12H05	J23
	80.4	160.1	MDM 1180S12H05	J58
	80.4	160.1	MDW 1180HX5	J66
	80.7	160.4	MDW 1180HGS5	J46
	116.4	196.1	MDE 1180S12H08	J23
	116.7	196.4	MDW 1180HGS8	J46
11.9	31.4	102.2	MDE 1190S12E02	J15
	31.7	102.5	MDW 1190GS2	J41
	35.7	90.0	MDF 1190S2D	J29
	35.7	160.0	MDF 1190L2D	J32
	44.4	124.2	MDE 1190S12H03	J23
	44.4	124.2	MDM 1190S12H03	J58
	44.4	124.2	MDW 1190HX3	J66
	44.7	124.5	MDW 1190HGS3	J46
	47.6	122.0	MDF 1190H3D	J35
	57.4	123.2	MDE 1190S12E04	J15
	57.7	123.5	MDW 1190GS4	J41
	71.4	158.0	MDF 1190H5D	J35
	80.4	160.2	MDE 1190S12H05	J23
	80.4	160.2	MDM 1190S12H05	J58
	80.4	160.2	MDW 1190HX5	J66
	80.7	160.5	MDW 1190HGS5	J46
	116.4	196.2	MDE 1190S12H08	J23
	116.7	196.5	MDW 1190HGS8	J46
12.0	21.0	88.5	SMDT 1200 MFS+SMDH 120-1.5D	J124
	21.0	88.5	SMDT 1200 MFS+SMDH 120-1.5DF	J122
	23.0	90.5	SMDT 1200 MTL/MSL/MEL+SMDH 120-1.5D	J116
	23.0	90.5	SMDT 1200 MTL/MSL/MEL+SMDH 120-1.5DF	J114
	31.2	102.2	MDE 1200S12E02	J15
	31.5	102.5	MDW 1200GS2	J41
	36.0	90.0	MDF 1200S2D	J29
	36.0	160.0	MDF 1200L2D-S10	J32
	36.0	170.0	MDF 1200L2D	J32
	40.0	105.2	SMDT 1200 MFS+SMDH 120-3D	J124
	40.0	105.2	SMDT 1200 MFS+SMDH 120-3DF	J122
	40.0	105.2	SMDT 1200 MFS+SMDH 120M	J120
	42.0	107.2	SMDT 1200 MTL/MSL/MEL+SMDH 120-3D	J116
	42.0	107.2	SMDT 1200 MTL/MSL/MEL+SMDH 120-3DF	J114
	42.0	107.2	SMDT 1200 MTL/MSL/MEL+SMDH 120M	J112
	43.6	123.6	MDA 1200S12H03	J89
	43.6	123.6	MDW 1200PHT	J82
	44.2	124.2	MDE 1200S12H03	J23
	44.2	124.2	MDM 1200S12H03	J58
	44.2	124.2	MDW 1200HX3	J66
	44.5	123.5	MDW 1200SGS3	J75
	44.5	124.5	MDW 1200HGS3	J46
	44.5	124.5	MDW 1200HY3	J71
	44.5	124.5	MDW 1200NHGS3	J95
	48.0	122.0	MDF 1200H3D	J35
	57.2	123.2	MDE 1200S12E04	J15
	57.5	123.5	MDW 1200GS4	J41
	65.0	130.2	SMDT 1200 MFS+SMDH 120-5D	J124
	65.0	130.2	SMDT 1200 MFS+SMDH 120-5DF	J122
	65.0	130.2	SMDT 1200 MFS+SMDH 120L	J120
	67.0	132.2	SMDT 1200 MTL/MSL/MEL+SMDH 120-5D	J116
	67.0	132.2	SMDT 1200 MTL/MSL/MEL+SMDH 120-5DF	J114
	67.0	132.2	SMDT 1200 MTL/MSL/MEL+SMDH 120L	J112
	72.0	158.0	MDF 1200H5D	J35
	79.6	159.6	MDA 1200S12H05	J89
	80.2	160.2	MDE 1200S12H05	J23
	80.2	160.2	MDM 1200S12H05	J58
	80.2	160.2	MDW 1200HX5	J66
	80.5	160.5	MDW 1200HGS5	J46
	80.5	160.5	MDW 1200HY5	J71
	80.5	160.5	MDW 1200NHGS5	J95
	96.0	162.4	SMDT 1200 MFS+SMDH 120-8D	J124
	96.0	162.4	SMDT 1200 MFS+SMDH 120-8DF	J122
	98.0	164.4	SMDT 1200 MTL/MSL/MEL+SMDH 120-8D	J116
	98.0	164.4	SMDT 1200 MTL/MSL/MEL+SMDH 120-8DF	J114
	116.2	196.2	MDE 1200S12H08	J23
	116.2	196.2	MDW 1200HX8	J66
	116.5	196.5	MDW 1200HGS8	J46
	144.0	211.3	SMDT 1200 MFS+SMDH 120-12D	J124
	146.0	213.3	SMDT 1200 MTL/MSL/MEL+SMDH 120-12D	J116
	152.2	232.2	MDA 1200S12H10	J89
	152.5	232.5	MDW 1200NHGS10	J95
	164.2	244.2	MDW 1200XHGS10	J82

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø12.0 to ø12.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
12.0	188.2	268.2	MDW 1200XHGS12	J82
	224.2	304.2	MDW 1200XHGS15	J82
	284.2	364.2	MDW 1200XHGS20	J82
	344.2	424.2	MDW 1200XHGS25	J82
12.04	31.1	102.2	MDE 1204S13E02H	J17
12.1	23.0	90.5	SMDT 1210 MTL/MSL/MEL+SMDH 120-1.5D	J116
	23.0	90.5	SMDT 1210 MTL/MSL/MEL+SMDH 120-1.5DF	J114
	31.1	102.2	MDE 1210S13E02	J15
	36.3	100.0	MDF 1210S2D	J29
	42.0	107.2	SMDT 1210 MTL/MSL/MEL+SMDH 120-3D	J116
	42.0	107.2	SMDT 1210 MTL/MSL/MEL+SMDH 120-3DF	J114
	42.0	107.2	SMDT 1210 MTL/MSL/MEL+SMDH 120M	J112
	46.6	130.2	MDE 1210S13H03	J23
	46.6	130.2	MDM 1210S13H03	J58
	46.9	130.5	MDW 1210HGS3	J46
	46.9	130.5	MDW 1210NHGS3	J95
	60.1	139.2	MDE 1210S13E04	J15
	67.0	132.2	SMDT 1210 MTL/MSL/MEL+SMDH 120-5D	J116
	67.0	132.2	SMDT 1210 MTL/MSL/MEL+SMDH 120-5DF	J114
	67.0	132.2	SMDT 1210 MTL/MSL/MEL+SMDH 120L	J112
	84.1	169.2	MDE 1210S13H05	J23
	84.1	169.2	MDM 1210S13H05	J58
	84.4	169.5	MDW 1210HGS5	J46
	84.4	169.5	MDW 1210NHGS5	J95
	98.0	164.4	SMDT 1210 MTL/MSL/MEL+SMDH 120-8D	J116
	98.0	164.4	SMDT 1210 MTL/MSL/MEL+SMDH 120-8DF	J114
	121.6	208.2	MDE 1210S13H08	J23
	146.0	213.3	SMDT 1210 MTL/MSL/MEL+SMDH 120-12D	J116
12.2	23.0	90.5	SMDT 1220 MTL/MSL/MEL+SMDH 120-1.5D	J116
	23.0	90.5	SMDT 1220 MTL/MSL/MEL+SMDH 120-1.5DF	J114
	30.9	102.2	MDE 1220S13E02	J15
	36.6	100.0	MDF 1220S2D	J29
	42.0	107.2	SMDT 1220 MTL/MSL/MEL+SMDH 120-3D	J116
	42.0	107.2	SMDT 1220 MTL/MSL/MEL+SMDH 120-3DF	J114
	42.0	107.2	SMDT 1220 MTL/MSL/MEL+SMDH 120M	J112
	46.4	130.2	MDE 1220S13H03	J23
	46.4	130.2	MDM 1220S13H03	J58
	46.7	130.5	MDW 1220HGS3	J46
	59.9	139.2	MDE 1220S13E04	J15
	67.0	132.2	SMDT 1220 MTL/MSL/MEL+SMDH 120-5D	J116
	67.0	132.2	SMDT 1220 MTL/MSL/MEL+SMDH 120-5DF	J114
	67.0	132.2	SMDT 1220 MTL/MSL/MEL+SMDH 120L	J112
	83.9	169.2	MDE 1220S13H05	J23
	83.9	169.2	MDM 1220S13H05	J58
	84.2	169.5	MDW 1220HGS5	J46
	98.0	164.4	SMDT 1220 MTL/MSL/MEL+SMDH 120-8D	J116
	98.0	164.4	SMDT 1220 MTL/MSL/MEL+SMDH 120-8DF	J114
	121.4	208.2	MDE 1220S13H08	J23
	146.0	213.3	SMDT 1220 MTL/MSL/MEL+SMDH 120-12D	J116
12.3	23.0	90.5	SMDT 1230 MTL/MSL/MEL+SMDH 120-1.5D	J116
	23.0	90.5	SMDT 1230 MTL/MSL/MEL+SMDH 120-1.5DF	J114
	30.8	102.2	MDE 1230S13E02	J15
	36.9	100.0	MDF 1230S2D	J29
	42.0	107.2	SMDT 1230 MTL/MSL/MEL+SMDH 120-3D	J116
	42.0	107.2	SMDT 1230 MTL/MSL/MEL+SMDH 120-3DF	J114
	42.0	107.2	SMDT 1230 MTL/MSL/MEL+SMDH 120M	J112
	46.3	130.2	MDE 1230S13H03	J23
	46.3	130.2	MDM 1230S13H03	J58
	46.6	130.5	MDW 1230HGS3	J47
	46.6	130.5	MDW 1230NHGS3	J95
	59.8	139.2	MDE 1230S13E04	J15
	67.0	132.2	SMDT 1230 MTL/MSL/MEL+SMDH 120-5D	J116
	67.0	132.2	SMDT 1230 MTL/MSL/MEL+SMDH 120-5DF	J114
	67.0	132.2	SMDT 1230 MTL/MSL/MEL+SMDH 120L	J112
	83.8	169.2	MDE 1230S13H05	J23
	83.8	169.2	MDM 1230S13H05	J58
	84.1	169.5	MDW 1230HGS5	J47
	84.1	169.5	MDW 1230NHGS5	J95
	98.0	164.4	SMDT 1230 MTL/MSL/MEL+SMDH 120-8D	J116
	98.0	164.4	SMDT 1230 MTL/MSL/MEL+SMDH 120-8DF	J114
	121.3	208.2	MDE 1230S13H08	J23
	146.0	213.3	SMDT 1230 MTL/MSL/MEL+SMDH 120-12D	J116
12.4	23.0	90.5	SMDT 1240 MTL/MSL/MEL+SMDH 120-1.5D	J116
	23.0	90.5	SMDT 1240 MTL/MSL/MEL+SMDH 120-1.5DF	J114
	30.7	102.3	MDE 1240S13E02	J15
	37.2	100.0	MDF 1240S2D	J29
	42.0	107.2	SMDT 1240 MTL/MSL/MEL+SMDH 120-3D	J116
	42.0	107.2	SMDT 1240 MTL/MSL/MEL+SMDH 120-3DF	J114
	42.0	107.2	SMDT 1240 MTL/MSL/MEL+SMDH 120M	J112
	46.2	130.3	MDE 1240S13H03	J23

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø12.4 to ø12.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
12.4	46.2	130.3	MDM 1240S13H03	J58
	46.5	130.6	MDW 1240HGS3	J47
	59.7	139.3	MDE 1240S13E04	J15
	67.0	132.2	SMDT 1240 MTL/MSL/MEL+SMDH 120-5D	J116
	67.0	132.2	SMDT 1240 MTL/MSL/MEL+SMDH 120-5DF	J114
	67.0	132.2	SMDT 1240 MTL/MSL/MEL+SMDH 120L	J112
	83.7	169.3	MDE 1240S13H05	J23
	83.7	169.3	MDM 1240S13H05	J58
	84.0	169.6	MDW 1240HGS5	J47
	98.0	164.4	SMDT 1240 MTL/MSL/MEL+SMDH 120-8D	J116
	98.0	164.4	SMDT 1240 MTL/MSL/MEL+SMDH 120-8DF	J114
	121.2	208.3	MDE 1240S13H08	J23
	146.0	213.3	SMDT 1240 MTL/MSL/MEL+SMDH 120-12D	J116
12.5	22.0	88.8	SMDT 1250 MFS+SMDH 125-1.5D	J124
	22.0	88.8	SMDT 1250 MFS+SMDH 125-1.5DF	J122
	24.0	91.0	SMDT 1250 MTL/MSL/MEL+SMDH 125-1.5D	J116
	24.0	91.0	SMDT 1250 MTL/MSL/MEL+SMDH 125-1.5DF	J114
	30.6	102.3	MDE 1250S13E02	J15
	37.5	100.0	MDF 1250S2D	J29
	37.5	180.0	MDF 1250L2D	J32
	41.0	105.1	SMDT 1250 MFS+SMDH 125-3D	J124
	41.0	105.1	SMDT 1250 MFS+SMDH 125-3DF	J122
	41.0	105.1	SMDT 1250 MFS+SMDH 125M	J120
	44.0	107.3	SMDT 1250 MTL/MSL/MEL+SMDH 125-3D	J116
	44.0	107.3	SMDT 1250 MTL/MSL/MEL+SMDH 125-3DF	J114
	44.0	107.3	SMDT 1250 MTL/MSL/MEL+SMDH 125M	J112
	45.5	129.7	MDW 1250PHT	J82
	46.1	130.3	MDE 1250S13H03	J23
	46.1	130.3	MDM 1250S13H03	J58
	46.1	130.3	MDW 1250HX3	J66
	46.4	130.6	MDW 1250HGS3	J47
	46.4	130.6	MDW 1250HY3	J71
	46.4	130.6	MDW 1250NHGS3	J95
	50.0	128.0	MDF 1250H3D	J35
	59.6	139.3	MDE 1250S13E04	J15
	67.0	130.1	SMDT 1250 MFS+SMDH 125-5D	J124
	67.0	130.1	SMDT 1250 MFS+SMDH 125-5DF	J122
	67.0	130.1	SMDT 1250 MFS+SMDH 125L	J120
	69.0	132.3	SMDT 1250 MTL/MSL/MEL+SMDH 125-5D	J116
	69.0	132.3	SMDT 1250 MTL/MSL/MEL+SMDH 125-5DF	J114
	69.0	132.3	SMDT 1250 MTL/MSL/MEL+SMDH 125L	J112
	75.0	167.0	MDF 1250H5D	J35
	83.6	169.3	MDE 1250S13H05	J23
	83.6	169.3	MDM 1250S13H05	J58
	83.6	169.3	MDW 1250HX5	J66
	83.9	169.6	MDW 1250HGS5	J47
	83.9	169.6	MDW 1250HY5	J71
	83.9	169.6	MDW 1250NHGS5	J95
	100.0	167.9	SMDT 1250 MFS+SMDH 125-8D	J124
	100.0	167.9	SMDT 1250 MFS+SMDH 125-8DF	J122
	102.0	170.1	SMDT 1250 MTL/MSL/MEL+SMDH 125-8D	J116
	102.0	170.1	SMDT 1250 MTL/MSL/MEL+SMDH 125-8DF	J114
	121.1	208.3	MDE 1250S13H08	J23
	121.1	208.3	MDW 1250HX8	J66
	121.4	208.6	MDW 1250HGS8	J47
	121.4	208.6	MDW 1250HY8	J71
	150.0	217.3	SMDT 1250 MFS+SMDH 125-12D	J124
	152.0	219.5	SMDT 1250 MTL/MSL/MEL+SMDH 125-12D	J116
	158.9	247.6	MDW 1250NHGS10	J95
	171.6	255.3	MDW 1250XHGS10	J82
	194.6	278.3	MDW 1250XHGS12	J82
	231.6	315.3	MDW 1250XHGS15	J82
	294.6	378.3	MDW 1250XHGS20	J82
12.52	32.4	102.3	MDE 1252S13E02H	J17
12.6	24.0	91.0	SMDT 1260 MTL/MSL/MEL+SMDH 125-1.5D	J116
	24.0	91.0	SMDT 1260 MTL/MSL/MEL+SMDH 125-1.5DF	J114
	32.4	102.3	MDE 1260S13E02	J15
	37.8	100.0	MDF 1260S2D	J29
	44.0	107.3	SMDT 1260 MTL/MSL/MEL+SMDH 125-3D	J116
	44.0	107.3	SMDT 1260 MTL/MSL/MEL+SMDH 125-3DF	J114
	44.0	107.3	SMDT 1260 MTL/MSL/MEL+SMDH 125M	J112
	48.4	130.3	MDE 1260S13H03	J23
	48.4	130.3	MDM 1260S13H03	J58
	48.7	130.6	MDW 1260HGS3	J47
	61.4	139.3	MDE 1260S13E04	J15
	69.0	132.3	SMDT 1260 MTL/MSL/MEL+SMDH 125-5D	J116
	69.0	132.3	SMDT 1260 MTL/MSL/MEL+SMDH 125-5DF	J114
	69.0	132.3	SMDT 1260 MTL/MSL/MEL+SMDH 125L	J112
	87.4	169.3	MDE 1260S13H05	J23
	87.4	169.3	MDM 1260S13H05	J58

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø12.6 to ø13.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
12.6	87.7	169.6	MDW 1260HGS5	J47
	102.0	170.1	SMDT 1260 MTL/MSL/MEL+SMDH 125-8D	J116
	102.0	170.1	SMDT 1260 MTL/MSL/MEL+SMDH 125-8DF	J114
	126.4	208.3	MDE 1260S13H08	J23
	152.0	219.5	SMDT 1260 MTL/MSL/MEL+SMDH 125-12D	J116
12.7	24.0	91.0	SMDT 1270 MTL/MSL/MEL+SMDH 125-1.5D	J116
	24.0	91.0	SMDT 1270 MTL/MSL/MEL+SMDH 125-1.5DF	J114
	32.3	102.3	MDE 1270S13E02	J15
	38.1	100.0	MDF 1270S2D	J29
	44.0	107.3	SMDT 1270 MTL/MSL/MEL+SMDH 125-3D	J116
	44.0	107.3	SMDT 1270 MTL/MSL/MEL+SMDH 125-3DF	J114
	44.0	107.3	SMDT 1270 MTL/MSL/MEL+SMDH 125M	J112
	48.3	130.3	MDE 1270S13H03	J23
	48.3	130.3	MDM 1270S13H03	J58
	48.6	130.6	MDW 1270HGS3	J47
	61.3	139.3	MDE 1270S13E04	J15
	69.0	132.3	SMDT 1270 MTL/MSL/MEL+SMDH 125-5D	J116
	69.0	132.3	SMDT 1270 MTL/MSL/MEL+SMDH 125-5DF	J114
	69.0	132.3	SMDT 1270 MTL/MSL/MEL+SMDH 125L	J112
	87.3	169.3	MDE 1270S13H05	J23
	87.3	169.3	MDM 1270S13H05	J58
	87.6	169.6	MDW 1270HGS5	J47
	102.0	170.1	SMDT 1270 MTL/MSL/MEL+SMDH 125-8D	J116
	102.0	170.1	SMDT 1270 MTL/MSL/MEL+SMDH 125-8DF	J114
	126.3	208.3	MDE 1270S13H08	J23
	152.0	219.5	SMDT 1270 MTL/MSL/MEL+SMDH 125-12D	J116
12.8	24.0	91.0	SMDT 1280 MTL/MSL/MEL+SMDH 125-1.5D	J116
	24.0	91.0	SMDT 1280 MTL/MSL/MEL+SMDH 125-1.5DF	J114
	32.1	102.3	MDE 1280S13E02	J15
	38.4	100.0	MDF 1280S2D	J29
	44.0	107.3	SMDT 1280 MTL/MSL/MEL+SMDH 125-3D	J116
	44.0	107.3	SMDT 1280 MTL/MSL/MEL+SMDH 125-3DF	J114
	44.0	107.3	SMDT 1280 MTL/MSL/MEL+SMDH 125M	J112
	48.1	130.3	MDE 1280S13H03	J23
	48.1	130.3	MDM 1280S13H03	J58
	48.4	130.6	MDW 1280HGS3	J47
	61.1	139.3	MDE 1280S13E04	J15
	69.0	132.3	SMDT 1280 MTL/MSL/MEL+SMDH 125-5D	J116
	69.0	132.3	SMDT 1280 MTL/MSL/MEL+SMDH 125-5DF	J114
	69.0	132.3	SMDT 1280 MTL/MSL/MEL+SMDH 125L	J112
	87.1	169.3	MDE 1280S13H05	J23
	87.1	169.3	MDM 1280S13H05	J58
	87.4	169.6	MDW 1280HGS5	J47
	102.0	170.1	SMDT 1280 MTL/MSL/MEL+SMDH 125-8D	J116
	102.0	170.1	SMDT 1280 MTL/MSL/MEL+SMDH 125-8DF	J114
	126.1	208.3	MDE 1280S13H08	J23
	152.0	219.5	SMDT 1280 MTL/MSL/MEL+SMDH 125-12D	J116
12.9	24.0	91.0	SMDT 1290 MTL/MSL/MEL+SMDH 125-1.5D	J116
	24.0	91.0	SMDT 1290 MTL/MSL/MEL+SMDH 125-1.5DF	J114
	32.0	102.3	MDE 1290S13E02	J15
	38.7	100.0	MDF 1290S2D	J29
	44.0	107.3	SMDT 1290 MTL/MSL/MEL+SMDH 125-3D	J116
	44.0	107.3	SMDT 1290 MTL/MSL/MEL+SMDH 125-3DF	J114
	44.0	107.3	SMDT 1290 MTL/MSL/MEL+SMDH 125M	J112
	48.0	130.3	MDE 1290S13H03	J23
	48.0	130.3	MDM 1290S13H03	J58
	48.4	130.7	MDW 1290HGS3	J47
	61.0	139.3	MDE 1290S13E04	J15
	69.0	132.3	SMDT 1290 MTL/MSL/MEL+SMDH 125-5D	J116
	69.0	132.3	SMDT 1290 MTL/MSL/MEL+SMDH 125-5DF	J114
	69.0	132.3	SMDT 1290 MTL/MSL/MEL+SMDH 125L	J112
	87.0	169.3	MDE 1290S13H05	J23
	87.0	169.3	MDM 1290S13H05	J58
	87.4	169.7	MDW 1290HGS5	J47
	102.0	170.1	SMDT 1290 MTL/MSL/MEL+SMDH 125-8D	J116
	102.0	170.1	SMDT 1290 MTL/MSL/MEL+SMDH 125-8DF	J114
	126.0	208.3	MDE 1290S13H08	J23
	152.0	219.5	SMDT 1290 MTL/MSL/MEL+SMDH 125-12D	J116
12.96	48.3	130.7	MDW 1296NHGS3	J95
	87.3	169.7	MDW 1296NHGS5	J95
13.0	23.0	90.0	SMDT 1300 MFS+SMDH 130-1.5D	J124
	23.0	90.0	SMDT 1300 MFS+SMDH 130-1.5DF	J122
	25.0	92.2	SMDT 1300 MTL/MSL/MEL+SMDH 130-1.5D	J116
	25.0	92.2	SMDT 1300 MTL/MSL/MEL+SMDH 130-1.5DF	J114
	31.9	102.4	MDE 1300S13E02	J15
	39.0	100.0	MDF 1300S2D	J29
	39.0	180.0	MDF 1300L2D	J32
	43.0	110.2	SMDT 1300 MFS+SMDH 130-3D	J124
	43.0	110.2	SMDT 1300 MFS+SMDH 130-3DF	J122
	43.0	110.2	SMDT 1300 MFS+SMDH 130M	J120

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø13.0 to ø13.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
	45.0	112.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-3D	J116
	45.0	112.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-3DF	J114
	45.0	112.4	SMDT 1300 MTL/MSL/MEL+SMDH 130M	J112
	47.2	129.7	MDW 1300PHT	J82
	47.9	130.4	MDE 1300S13H03	J23
	47.9	130.4	MDM 1300S13H03	J58
	47.9	130.4	MDW 1300HX3	J66
	48.2	130.7	MDW 1300HGS3	J47
	48.2	130.7	MDW 1300HY3	J71
	48.2	130.7	MDW 1300NHGS3	J95
	52.0	128.0	MDF 1300H3D	J35
	60.9	139.4	MDE 1300S13E04	J15
	70.0	140.2	SMDT 1300 MFS+SMDH 130-5D	J124
	70.0	140.2	SMDT 1300 MFS+SMDH 130-5DF	J122
	70.0	140.2	SMDT 1300 MFS+SMDH 130L	J120
	72.0	142.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-5D	J116
	72.0	142.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-5DF	J114
	72.0	142.4	SMDT 1300 MTL/MSL/MEL+SMDH 130L	J112
	78.0	167.0	MDF 1300H5D	J35
13.0	86.9	169.4	MDE 1300S13H05	J23
	86.9	169.4	MDM 1300S13H05	J58
	86.9	169.4	MDW 1300HX5	J66
	87.2	169.7	MDW 1300HGS5	J47
	87.2	169.7	MDW 1300HY5	J71
	87.2	169.7	MDW 1300NHGS5	J95
	104.0	176.2	SMDT 1300 MFS+SMDH 130-8D	J124
	104.0	176.2	SMDT 1300 MFS+SMDH 130-8DF	J122
	106.0	178.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-8D	J116
	106.0	178.4	SMDT 1300 MTL/MSL/MEL+SMDH 130-8DF	J114
	125.9	208.4	MDE 1300S13H08	J23
	125.9	208.4	MDW 1300HX8	J66
	126.2	208.7	MDW 1300HGS8	J47
	156.0	223.5	SMDT 1300 MFS+SMDH 130-12D	J124
	158.0	225.7	SMDT 1300 MTL/MSL/MEL+SMDH 130-12D	J116
	165.2	247.7	MDW 1300NHGS10	J95
	177.9	260.4	MDW 1300XHGS10	J82
	203.9	286.4	MDW 1300XHGS12	J82
	242.9	325.4	MDW 1300XHGS15	J82
	307.9	390.4	MDW 1300XHGS20	J82
13.1	25.0	92.2	SMDT 1310 MTL/MSL/MEL+SMDH 130-1.5D	J116
	25.0	92.2	SMDT 1310 MTL/MSL/MEL+SMDH 130-1.5DF	J114
	32.8	107.4	MDE 1310S14E02	J16
	39.3	110.0	MDF 1310S2D	J29
	45.0	112.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-3D	J116
	45.0	112.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-3DF	J114
	45.0	112.4	SMDT 1310 MTL/MSL/MEL+SMDH 130M	J112
	50.3	136.4	MDE 1310S14H03	J23
	50.3	136.4	MDM 1310S14H03	J58
	50.6	136.7	MDW 1310HGS3	J47
	66.8	149.4	MDE 1310S14E04	J16
	72.0	142.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-5D	J116
	72.0	142.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-5DF	J114
	72.0	142.4	SMDT 1310 MTL/MSL/MEL+SMDH 130L	J112
	90.8	178.4	MDE 1310S14H05	J23
	90.8	178.4	MDM 1310S14H05	J58
	91.1	178.7	MDW 1310HGS5	J47
	106.0	178.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-8D	J116
	106.0	178.4	SMDT 1310 MTL/MSL/MEL+SMDH 130-8DF	J114
	131.3	220.4	MDE 1310S14H08	J23
	158.0	225.7	SMDT 1310 MTL/MSL/MEL+SMDH 130-12D	J116
13.2	25.0	92.2	SMDT 1320 MTL/MSL/MEL+SMDH 130-1.5D	J116
	25.0	92.2	SMDT 1320 MTL/MSL/MEL+SMDH 130-1.5DF	J114
	32.6	107.4	MDE 1320S14E02	J16
	39.6	110.0	MDF 1320S2D	J29
	45.0	112.4	SMDT 1320 MTL/MSL/MEL+SMDH 130-3D	J116
	45.0	112.4	SMDT 1320 MTL/MSL/MEL+SMDH 130-3DF	J114
	45.0	112.4	SMDT 1320 MTL/MSL/MEL+SMDH 130M	J112
	50.1	136.4	MDE 1320S14H03	J23
	50.1	136.4	MDM 1320S14H03	J58
	50.4	136.7	MDW 1320HGS3	J47
	66.6	149.4	MDE 1320S14E04	J16
	72.0	142.4	SMDT 1320 MTL/MSL/MEL+SMDH 130-5D	J116
	72.0	142.4	SMDT 1320 MTL/MSL/MEL+SMDH 130-5DF	J114
	72.0	142.4	SMDT 1320 MTL/MSL/MEL+SMDH 130L	J112
	90.6	178.4	MDE 1320S14H05	J23
	90.6	178.4	MDM 1320S14H05	J58
	90.9	178.7	MDW 1320HGS5	J47
	106.0	178.4	SMDT 1320 MTL/MSL/MEL+SMDH 130-8D	J116
	106.0	178.4	SMDT 1320 MTL/MSL/MEL+SMDH 130-8DF	J114
	131.1	220.4	MDE 1320S14H08	J23

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø13.2 to ø13.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
13.2	158.0	225.7	SMDT 1320 MTL/MSL/MEL+SMDH 130-12D	J116
	25.0	92.2	SMDT 1330 MTL/MSL/MEL+SMDH 130-1.5D	J116
	25.0	92.2	SMDT 1330 MTL/MSL/MEL+SMDH 130-1.5DF	J114
	32.5	107.4	MDE 1330S14E02	J16
	39.9	110.0	MDF 1330S2D	J29
	45.0	112.4	SMDT 1330 MTL/MSL/MEL+SMDH 130-3D	J116
	45.0	112.4	SMDT 1330 MTL/MSL/MEL+SMDH 130-3DF	J114
	45.0	112.4	SMDT 1330 MTL/MSL/MEL+SMDH 130M	J112
	50.0	136.4	MDE 1330S14H03	J23
	50.0	136.4	MDM 1330S14H03	J58
	50.4	136.8	MDW 1330HGS3	J47
13.3	66.5	149.4	MDE 1330S14E04	J16
	72.0	142.4	SMDT 1330 MTL/MSL/MEL+SMDH 130-5D	J116
	72.0	142.4	SMDT 1330 MTL/MSL/MEL+SMDH 130-5DF	J114
	72.0	142.4	SMDT 1330 MTL/MSL/MEL+SMDH 130L	J112
	90.5	178.4	MDE 1330S14H05	J23
	90.5	178.4	MDM 1330S14H05	J58
	90.9	178.8	MDW 1330HGS5	J47
	106.0	178.4	SMDT 1330 MTL/MSL/MEL+SMDH 130-8D	J116
	106.0	178.4	SMDT 1330 MTL/MSL/MEL+SMDH 130-8DF	J114
	131.0	220.4	MDE 1330S14H08	J23
	158.0	225.7	SMDT 1330 MTL/MSL/MEL+SMDH 130-12D	J116
13.4	25.0	92.2	SMDT 1340 MTL/MSL/MEL+SMDH 130-1.5D	J116
	25.0	92.2	SMDT 1340 MTL/MSL/MEL+SMDH 130-1.5DF	J114
	32.3	107.4	MDE 1340S14E02	J16
	40.2	110.0	MDF 1340S2D	J29
	45.0	112.4	SMDT 1340 MTL/MSL/MEL+SMDH 130-3D	J116
	45.0	112.4	SMDT 1340 MTL/MSL/MEL+SMDH 130-3DF	J114
	45.0	112.4	SMDT 1340 MTL/MSL/MEL+SMDH 130M	J112
	49.8	136.4	MDE 1340S14H03	J23
	49.8	136.4	MDM 1340S14H03	J58
	50.2	136.8	MDW 1340HGS3	J47
	66.3	149.4	MDE 1340S14E04	J16
	72.0	142.4	SMDT 1340 MTL/MSL/MEL+SMDH 130-5D	J116
	72.0	142.4	SMDT 1340 MTL/MSL/MEL+SMDH 130-5DF	J114
	72.0	142.4	SMDT 1340 MTL/MSL/MEL+SMDH 130L	J112
	90.3	178.4	MDE 1340S14H05	J23
	90.3	178.4	MDM 1340S14H05	J58
	90.7	178.8	MDW 1340HGS5	J47
	106.0	178.4	SMDT 1340 MTL/MSL/MEL+SMDH 130-8D	J116
	106.0	178.4	SMDT 1340 MTL/MSL/MEL+SMDH 130-8DF	J114
	130.8	220.4	MDE 1340S14H08	J23
	158.0	225.7	SMDT 1340 MTL/MSL/MEL+SMDH 130-12D	J116
13.5	26.0	93.9	SMDT 1350 MFS+SMDH 140-1.5D	J124
	26.0	93.9	SMDT 1350 MFS+SMDH 140-1.5DF	J122
	29.0	96.3	SMDT 1350 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1350 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	32.3	107.5	MDE 1350S14E02	J16
	40.5	110.0	MDF 1350S2D	J29
	40.5	190.0	MDF 1350L2D	J32
	48.0	116.6	SMDT 1350 MFS+SMDH 140-3D	J124
	48.0	116.6	SMDT 1350 MFS+SMDH 140-3DF	J122
	48.0	116.6	SMDT 1350 MFS+SMDH 140M	J120
	49.1	135.8	MDW 1350PHT	J82
	49.8	136.5	MDE 1350S14H03	J23
	49.8	136.5	MDM 1350S14H03	J58
	49.8	136.5	MDW 1350HX3	J66
	50.1	136.8	MDW 1350HGS3	J47
	50.1	136.8	MDW 1350NHGS3	J96
	51.0	119.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1350 MTL/MSL/MEL+SMDH 140M	J112
	54.0	134.0	MDF 1350H3D	J35
	66.3	149.5	MDE 1350S14E04	J16
	77.0	146.6	SMDT 1350 MFS+SMDH 140-5D	J124
	77.0	146.6	SMDT 1350 MFS+SMDH 140-5DF	J122
	77.0	146.6	SMDT 1350 MFS+SMDH 140L	J120
	80.0	149.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1350 MTL/MSL/MEL+SMDH 140L	J112
	81.0	176.0	MDF 1350H5D	J35
	90.3	178.5	MDE 1350S14H05	J23
	90.3	178.5	MDM 1350S14H05	J58
	90.3	178.5	MDW 1350HX5	J66
	90.6	178.8	MDW 1350HGS5	J47
	90.6	178.8	MDW 1350NHGS5	J96
	121.0	191.6	SMDT 1350 MFS+SMDH 140-8D	J124
	121.0	191.6	SMDT 1350 MFS+SMDH 140-8DF	J122
	121.0	191.6	SMDT 1350 MFS+SMDH 140D	J120
	123.0	194.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-8D	J116

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø13.5 to ø13.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
13.5	123.0	194.0	SMDT 1350 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1350 MTL/MSL/MEL+SMDH 140D	J112
	130.8	220.5	MDE 1350S14H08	J23
	130.8	220.5	MDW 1350HX8	J66
	131.1	220.8	MDW 1350HGS8	J47
	168.0	236.1	SMDT 1350 MFS+SMDH 140-12D	J124
	170.0	238.5	SMDT 1350 MTL/MSL/MEL+SMDH 140-12D	J116
	185.3	271.5	MDW 1350XHGS10	J82
	210.3	296.5	MDW 1350XHGS12	J82
	250.3	336.5	MDW 1350XHGS15	J82
	318.3	404.5	MDW 1350XHGS20	J82
13.6	29.0	96.3	SMDT 1360 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1360 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	34.1	107.5	MDE 1360S14E02	J16
	40.8	110.0	MDF 1360S2D	J29
	51.0	119.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1360 MTL/MSL/MEL+SMDH 140M	J112
	52.1	136.5	MDE 1360S14H03	J23
	52.1	136.5	MDM 1360S14H03	J58
	52.4	136.8	MDW 1360HGS3	J47
	68.1	149.5	MDE 1360S14E04	J16
	80.0	149.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1360 MTL/MSL/MEL+SMDH 140L	J112
	94.1	178.5	MDE 1360S14H05	J23
	94.1	178.5	MDM 1360S14H05	J58
	94.4	178.8	MDW 1360HGS5	J47
	123.0	194.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1360 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1360 MTL/MSL/MEL+SMDH 140D	J112
	136.1	220.5	MDE 1360S14H08	J23
	170.0	238.5	SMDT 1360 MTL/MSL/MEL+SMDH 140-12D	J116
13.7	29.0	96.3	SMDT 1370 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1370 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	34.0	107.5	MDE 1370S14E02	J16
	41.1	110.0	MDF 1370S2D	J29
	51.0	119.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1370 MTL/MSL/MEL+SMDH 140M	J112
	52.0	136.5	MDE 1370S14H03	J23
	52.0	136.5	MDM 1370S14H03	J58
	52.3	136.8	MDW 1370HGS3	J47
	68.0	149.5	MDE 1370S14E04	J16
	80.0	149.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1370 MTL/MSL/MEL+SMDH 140L	J112
	94.0	178.5	MDE 1370S14H05	J23
	94.0	178.5	MDM 1370S14H05	J58
	94.3	178.8	MDW 1370HGS5	J47
	123.0	194.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1370 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1370 MTL/MSL/MEL+SMDH 140D	J112
	136.0	220.5	MDE 1370S14H08	J23
	170.0	238.5	SMDT 1370 MTL/MSL/MEL+SMDH 140-12D	J116
13.8	29.0	96.3	SMDT 1380 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1380 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	33.8	107.5	MDE 1380S14E02	J16
	41.4	110.0	MDF 1380S2D	J29
	51.0	119.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1380 MTL/MSL/MEL+SMDH 140M	J112
	51.8	136.5	MDE 1380S14H03	J23
	51.8	136.5	MDM 1380S14H03	J58
	52.2	136.9	MDW 1380HGS3	J47
	67.8	149.5	MDE 1380S14E04	J16
	80.0	149.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1380 MTL/MSL/MEL+SMDH 140L	J112
	93.8	178.5	MDE 1380S14H05	J23
	93.8	178.5	MDM 1380S14H05	J58
	94.2	178.9	MDW 1380HGS5	J47
	123.0	194.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1380 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1380 MTL/MSL/MEL+SMDH 140D	J112
	135.8	220.5	MDE 1380S14H08	J23
	170.0	238.5	SMDT 1380 MTL/MSL/MEL+SMDH 140-12D	J116
13.85	33.7	107.5	MDE 1385S14E02H	J17
13.9	29.0	96.3	SMDT 1390 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1390 MTL/MSL/MEL+SMDH 140-1.5DF	J114

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø13.9 to ø14.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
13.9	33.7	107.5	MDE 1390S14E02	J16
	41.7	110.0	MDF 1390S2D	J29
	51.0	119.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1390 MTL/MSL/MEL+SMDH 140M	J112
	51.7	136.5	MDE 1390S14H03	J23
	51.7	136.5	MDM 1390S14H03	J58
	52.1	136.9	MDW 1390HGS3	J47
	67.7	149.5	MDE 1390S14E04	J16
	80.0	149.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1390 MTL/MSL/MEL+SMDH 140L	J112
	93.7	178.5	MDE 1390S14H05	J23
	93.7	178.5	MDM 1390S14H05	J58
	94.1	178.9	MDW 1390HGS5	J47
	123.0	194.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1390 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1390 MTL/MSL/MEL+SMDH 140D	J112
	135.7	220.5	MDE 1390S14H08	J23
	170.0	238.5	SMDT 1390 MTL/MSL/MEL+SMDH 140-12D	J116
13.92	33.5	107.5	MDE 1392S14E02H	J17
13.97	33.5	107.5	MDE 1397S14E02H	J17
14.0	26.0	93.9	SMDT 1400 MFS+SMDH 140-1.5D	J124
	26.0	93.9	SMDT 1400 MFS+SMDH 140-1.5DF	J122
	29.0	96.3	SMDT 1400 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1400 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	33.5	107.5	MDE 1400S14E02	J16
	42.0	110.0	MDF 1400S2D	J29
	42.0	190.0	MDF 1400L2D	J32
	42.0	190.0	MDF 1400L2D-S12	J32
	48.0	116.6	SMDT 1400 MFS+SMDH 140-3D	J124
	48.0	116.6	SMDT 1400 MFS+SMDH 140-3DF	J122
	48.0	116.6	SMDT 1400 MFS+SMDH 140M	J120
	50.9	135.9	MDW 1400PHT	J82
	51.0	119.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1400 MTL/MSL/MEL+SMDH 140M	J112
	51.5	136.5	MDE 1400S14H03	J23
	51.5	136.5	MDM 1400S14H03	J58
	51.5	136.5	MDW 1400HX3	J67
	51.9	136.9	MDW 1400HGS3	J47
	51.9	136.9	MDW 1400HY3	J71
	51.9	136.9	MDW 1400NHGS3	J96
	56.0	134.0	MDF 1400H3D	J35
	67.5	149.5	MDE 1400S14E04	J16
	77.0	146.6	SMDT 1400 MFS+SMDH 140-5D	J124
	77.0	146.6	SMDT 1400 MFS+SMDH 140-5DF	J122
	77.0	146.6	SMDT 1400 MFS+SMDH 140L	J120
	80.0	149.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1400 MTL/MSL/MEL+SMDH 140L	J112
	84.0	176.0	MDF 1400H5D	J35
	93.5	178.5	MDE 1400S14H05	J23
	93.5	178.5	MDM 1400S14H05	J58
	93.5	178.5	MDW 1400HX5	J67
	93.9	178.9	MDW 1400HGS5	J47
	93.9	178.9	MDW 1400HY5	J71
	93.9	178.9	MDW 1400NHGS5	J96
	121.0	191.6	SMDT 1400 MFS+SMDH 140-8D	J124
	121.0	191.6	SMDT 1400 MFS+SMDH 140-8DF	J122
	121.0	191.6	SMDT 1400 MFS+SMDH 140D	J120
	123.0	194.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1400 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1400 MTL/MSL/MEL+SMDH 140D	J112
	135.5	220.5	MDE 1400S14H08	J23
	135.9	220.9	MDW 1400HGS8	J47
	168.0	236.1	SMDT 1400 MFS+SMDH 140-12D	J124
	170.0	238.5	SMDT 1400 MTL/MSL/MEL+SMDH 140-12D	J116
	191.5	276.5	MDW 1400XHGS10	J82
	219.5	304.5	MDW 1400XHGS12	J82
	261.5	346.5	MDW 1400XHGS15	J82
	331.5	416.5	MDW 1400XHGS20	J82
14.1	29.0	96.3	SMDT 1410 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1410 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	33.5	110.6	MDE 1410S15E02	J16
	42.3	110.0	MDF 1410S2D	J29
	51.0	119.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1410 MTL/MSL/MEL+SMDH 140M	J112
	54.0	142.6	MDE 1410S15H03	J23

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø14.1 to ø14.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
14.1	54.0	142.6	MDM 1410S15H03	J58
	54.3	142.9	MDW 1410HGS3	J47
	54.3	142.9	MDW 1410NHGS3	J96
	70.5	155.6	MDE 1410S15E04	J16
	80.0	149.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1410 MTL/MSL/MEL+SMDH 140L	J112
	97.5	187.6	MDE 1410S15H05	J23
	97.5	187.6	MDM 1410S15H05	J58
	97.8	187.9	MDW 1410HGS5	J47
	97.8	187.9	MDW 1410NHGS5	J96
	123.0	194.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1410 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1410 MTL/MSL/MEL+SMDH 140D	J112
	141.0	232.6	MDE 1410S15H08	J23
	170.0	238.5	SMDT 1410 MTL/MSL/MEL+SMDH 140-12D	J116
14.2	29.0	96.3	SMDT 1420 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1420 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	33.3	110.6	MDE 1420S15E02	J16
	42.6	110.0	MDF 1420S2D	J29
	51.0	119.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1420 MTL/MSL/MEL+SMDH 140M	J112
	53.8	142.6	MDE 1420S15H03	J23
	53.8	142.6	MDM 1420S15H03	J58
	54.1	142.9	MDW 1420HGS3	J47
	70.3	155.6	MDE 1420S15E04	J16
	80.0	149.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1420 MTL/MSL/MEL+SMDH 140L	J112
	97.3	187.6	MDE 1420S15H05	J23
	97.3	187.6	MDM 1420S15H05	J58
	97.6	187.9	MDW 1420HGS5	J47
	123.0	194.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1420 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1420 MTL/MSL/MEL+SMDH 140D	J112
	140.8	232.6	MDE 1420S15H08	J23
	170.0	238.5	SMDT 1420 MTL/MSL/MEL+SMDH 140-12D	J116
14.3	29.0	96.3	SMDT 1430 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1430 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	33.2	110.6	MDE 1430S15E02	J16
	42.9	110.0	MDF 1430S2D	J29
	51.0	119.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1430 MTL/MSL/MEL+SMDH 140M	J112
	53.7	142.6	MDE 1430S15H03	J23
	53.7	142.6	MDM 1430S15H03	J58
	54.1	143.0	MDW 1430HGS3	J47
	70.2	155.6	MDE 1430S15E04	J16
	80.0	149.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1430 MTL/MSL/MEL+SMDH 140L	J112
	97.2	187.6	MDE 1430S15H05	J23
	97.2	187.6	MDM 1430S15H05	J58
	97.6	188.0	MDW 1430HGS5	J47
	123.0	194.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1430 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1430 MTL/MSL/MEL+SMDH 140D	J112
	140.7	232.6	MDE 1430S15H08	J23
	170.0	238.5	SMDT 1430 MTL/MSL/MEL+SMDH 140-12D	J116
14.4	29.0	96.3	SMDT 1440 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1440 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	33.0	110.6	MDE 1440S15E02	J16
	43.2	110.0	MDF 1440S2D	J29
	51.0	119.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1440 MTL/MSL/MEL+SMDH 140M	J112
	53.5	142.6	MDE 1440S15H03	J23
	53.5	142.6	MDM 1440S15H03	J58
	53.9	143.0	MDW 1440HGS3	J47
	70.0	155.6	MDE 1440S15E04	J16
	80.0	149.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1440 MTL/MSL/MEL+SMDH 140L	J112
	97.0	187.6	MDE 1440S15H05	J23
	97.0	187.6	MDM 1440S15H05	J58
	97.4	188.0	MDW 1440HGS5	J47
	123.0	194.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1440 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1440 MTL/MSL/MEL+SMDH 140D	J112

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø14.4 to ø14.7mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
14.4	140.5	232.6	MDE 1440S15H08	J23
	170.0	238.5	SMDT 1440 MTL/MSL/MEL+SMDH 140-12D	J116
14.5	26.0	93.9	SMDT 1450 MFS+SMDH 140-1.5D	J124
	26.0	93.9	SMDT 1450 MFS+SMDH 140-1.5DF	J122
	29.0	96.3	SMDT 1450 MTL/MSL/MEL+SMDH 140-1.5D	J116
	29.0	96.3	SMDT 1450 MTL/MSL/MEL+SMDH 140-1.5DF	J114
	32.9	110.6	MDE 1450S15E02	J16
	43.5	110.0	MDF 1450S2D	J29
	43.5	200.0	MDF 1450L2D	J32
	48.0	116.6	SMDT 1450 MFS+SMDH 140-3D	J124
	48.0	116.6	SMDT 1450 MFS+SMDH 140-3DF	J122
	48.0	116.6	SMDT 1450 MFS+SMDH 140M	J120
	51.0	119.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-3D	J116
	51.0	119.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-3DF	J114
	51.0	119.0	SMDT 1450 MTL/MSL/MEL+SMDH 140M	J112
	52.7	141.9	MDW 1450PHT	J82
	53.4	142.6	MDE 1450S15H03	J23
	53.4	142.6	MDM 1450S15H03	J58
	53.4	142.6	MDW 1450HX3	J67
	53.8	143.0	MDW 1450HGS3	J47
	53.8	143.0	MDW 1450NHGS3	J96
	58.0	140.0	MDF 1450H3D	J35
	69.9	155.6	MDE 1450S15E04	J16
	77.0	146.6	SMDT 1450 MFS+SMDH 140-5D	J124
	77.0	146.6	SMDT 1450 MFS+SMDH 140-5DF	J122
	77.0	146.6	SMDT 1450 MFS+SMDH 140L	J120
	80.0	149.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-5D	J116
	80.0	149.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-5DF	J114
	80.0	149.0	SMDT 1450 MTL/MSL/MEL+SMDH 140L	J112
	87.0	185.0	MDF 1450H5D	J35
	96.9	187.6	MDE 1450S15H05	J23
	96.9	187.6	MDM 1450S15H05	J58
	96.9	187.6	MDW 1450HX5	J67
	97.3	188.0	MDW 1450HGS5	J47
	97.3	188.0	MDW 1450NHGS5	J96
	121.0	191.6	SMDT 1450 MFS+SMDH 140-8D	J124
	121.0	191.6	SMDT 1450 MFS+SMDH 140-8DF	J122
	121.0	191.6	SMDT 1450 MFS+SMDH 140D	J120
	123.0	194.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-8D	J116
	123.0	194.0	SMDT 1450 MTL/MSL/MEL+SMDH 140-8DF	J114
	123.0	194.0	SMDT 1450 MTL/MSL/MEL+SMDH 140D	J112
	140.4	232.6	MDE 1450S15H08	J23
	140.8	233.0	MDW 1450HGS8	J47
	168.0	236.1	SMDT 1450 MFS+SMDH 140-12D	J124
	170.0	238.5	SMDT 1450 MTL/MSL/MEL+SMDH 140-12D	J116
	198.9	287.6	MDW 1450XHGS10	J82
	225.9	314.6	MDW 1450XHGS12	J82
	268.9	357.6	MDW 1450XHGS15	J82
14.6	31.0	100.0	SMDT 1460 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1460 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	33.8	110.7	MDE 1460S15E02	J16
	43.8	110.0	MDF 1460S2D	J29
	54.0	129.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1460 MTL/MSL/MEL+SMDH 150M	J112
	55.8	142.7	MDE 1460S15H03	J24
	55.8	142.7	MDM 1460S15H03	J58
	56.1	143.0	MDW 1460HGS3	J47
	71.8	155.7	MDE 1460S15E04	J16
	85.0	159.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1460 MTL/MSL/MEL+SMDH 150L	J112
	100.8	187.7	MDE 1460S15H05	J24
	100.8	187.7	MDM 1460S15H05	J58
	101.1	188.0	MDW 1460HGS5	J47
	131.0	204.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1460 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1460 MTL/MSL/MEL+SMDH 150D	J112
	145.8	232.7	MDE 1460S15H08	J24
	182.0	253.0	SMDT 1460 MTL/MSL/MEL+SMDH 150-12D	J116
14.7	31.0	100.0	SMDT 1470 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1470 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	33.7	110.7	MDE 1470S15E02	J16
	44.1	110.0	MDF 1470S2D	J29
	54.0	129.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1470 MTL/MSL/MEL+SMDH 150M	J112
	55.7	142.7	MDE 1470S15H03	J24
	55.7	142.7	MDM 1470S15H03	J58
	56.0	143.0	MDW 1470HGS3	J47

● Diameter ø14.7 to ø15.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
14.7	71.7	155.7	MDE 1470S15E04	J16
	85.0	159.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1470 MTL/MSL/MEL+SMDH 150L	J112
	100.7	187.7	MDE 1470S15H05	J24
	100.7	187.7	MDM 1470S15H05	J58
	101.0	188.0	MDW 1470HGS5	J47
	131.0	204.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1470 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1470 MTL/MSL/MEL+SMDH 150D	J112
	145.7	232.7	MDE 1470S15H08	J24
	182.0	253.0	SMDT 1470 MTL/MSL/MEL+SMDH 150-12D	J116
14.8	31.0	100.0	SMDT 1480 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1480 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	33.5	110.7	MDE 1480S15E02	J16
	44.4	110.0	MDF 1480S2D	J29
	54.0	129.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1480 MTL/MSL/MEL+SMDH 150M	J112
	55.5	142.7	MDE 1480S15H03	J24
	55.5	142.7	MDM 1480S15H03	J58
	55.9	143.1	MDW 1480HGS3	J47
	71.5	155.7	MDE 1480S15E04	J16
	85.0	159.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1480 MTL/MSL/MEL+SMDH 150L	J112
	100.5	187.7	MDE 1480S15H05	J24
	100.5	187.7	MDM 1480S15H05	J58
	100.9	188.1	MDW 1480HGS5	J47
	131.0	204.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1480 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1480 MTL/MSL/MEL+SMDH 150D	J112
	145.5	232.7	MDE 1480S15H08	J24
	182.0	253.0	SMDT 1480 MTL/MSL/MEL+SMDH 150-12D	J116
14.9	31.0	100.0	SMDT 1490 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1490 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	33.4	110.7	MDE 1490S15E02	J16
	44.7	110.0	MDF 1490S2D	J29
	54.0	129.2	SMDT 1490 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1490 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1490 MTL/MSL/MEL+SMDH 150M	J112
	55.4	142.7	MDE 1490S15H03	J24
	55.4	142.7	MDM 1490S15H03	J58
	55.8	143.1	MDW 1490HGS3	J47
	55.8	143.1	MDW 1490NHGS3	J96
	71.4	155.7	MDE 1490S15E04	J16
	85.0	159.2	SMDT 1490 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1490 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1490 MTL/MSL/MEL+SMDH 150L	J112
	100.4	187.7	MDE 1490S15H05	J24
	100.4	187.7	MDM 1490S15H05	J58
	100.8	188.1	MDW 1490HGS5	J47
	100.8	188.1	MDW 1490NHGS5	J96
	131.0	204.2	SMDT 1490 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1490 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1490 MTL/MSL/MEL+SMDH 150D	J112
	145.4	232.7	MDE 1490S15H08	J24
	182.0	253.0	SMDT 1490 MTL/MSL/MEL+SMDH 150-12D	J116
14.96	55.7	143.1	MDW 1496NHGS3	J96
	100.7	188.1	MDW 1496NHGS5	J96
15.0	28.0	97.3	SMDT 1500 MFS+SMDH 150-1.5D	J124
	28.0	97.3	SMDT 1500 MFS+SMDH 150-1.5DF	J122
	31.0	100.0	SMDT 1500 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1500 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	33.2	110.7	MDE 1500S15E02	J16
	45.0	110.0	MDF 1500S2D	J29
	45.0	200.0	MDF 1500L2D	J32
	51.0	126.6	SMDT 1500 MFS+SMDH 150-3D	J124
	51.0	126.6	SMDT 1500 MFS+SMDH 150-3DF	J122
	51.0	126.6	SMDT 1500 MFS+SMDH 150M	J120
	54.0	129.2	SMDT 1500 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1500 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1500 MTL/MSL/MEL+SMDH 150M	J112
	54.5	142.0	MDW 1500PHT	J82
	55.2	142.7	MDE 1500S15H03	J24
	55.2	142.7	MDM 1500S15H03	J59
	55.2	142.7	MDW 1500HX3	J67
	55.6	143.1	MDW 1500HGS3	J47
	55.6	143.1	MDW 1500NHGS3	J96
	60.0	140.0	MDF 1500H3D	J35

● Diameter ø15.0 to ø15.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
15.0	71.2	155.7	MDE 1500S15E04	J16
	82.0	156.6	SMDT 1500 MFS+SMDH 150-5D	J124
	82.0	156.6	SMDT 1500 MFS+SMDH 150-5DF	J122
	82.0	156.6	SMDT 1500 MFS+SMDH 150L	J120
	85.0	159.2	SMDT 1500 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1500 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1500 MTL/MSL/MEL+SMDH 150L	J112
	90.0	185.0	MDF 1500H5D	J35
	100.2	187.7	MDE 1500S15H05	J24
	100.2	187.7	MDM 1500S15H05	J59
	100.2	187.7	MDW 1500HX5	J67
	100.6	188.1	MDW 1500HGS5	J47
	100.6	188.1	MDW 1500NHGS5	J96
15.0	129.0	201.6	SMDT 1500 MFS+SMDH 150-8D	J124
	129.0	201.6	SMDT 1500 MFS+SMDH 150-8DF	J122
	129.0	201.6	SMDT 1500 MFS+SMDH 150D	J120
	131.0	204.2	SMDT 1500 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1500 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1500 MTL/MSL/MEL+SMDH 150D	J112
	145.2	232.7	MDE 1500S15H08	J24
	145.2	232.7	MDW 1500HX8	J67
	145.6	233.1	MDW 1500HGS8	J47
	180.0	250.4	SMDT 1500 MFS+SMDH 150-12D	J124
	182.0	253.0	SMDT 1500 MTL/MSL/MEL+SMDH 150-12D	J116
	205.2	292.7	MDW 1500XHGS10	J82
	235.2	322.7	MDW 1500XHGS12	J82
	280.2	367.7	MDW 1500XHGS15	J82
15.1	31.0	100.0	SMDT 1510 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1510 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	33.1	114.7	MDE 1510S16E02	J16
	45.3	115.0	MDF 1510S2D	J29
	54.0	129.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1510 MTL/MSL/MEL+SMDH 150M	J112
	57.6	148.7	MDE 1510S16H03	J24
	57.6	148.7	MDM 1510S16H03	J59
	58.0	149.1	MDW 1510HGS3	J47
	74.1	162.7	MDE 1510S16E04	J16
	85.0	159.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1510 MTL/MSL/MEL+SMDH 150L	J112
	104.1	196.7	MDE 1510S16H05	J24
	104.1	196.7	MDM 1510S16H05	J59
	104.5	197.1	MDW 1510HGS5	J47
	131.0	204.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1510 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1510 MTL/MSL/MEL+SMDH 150D	J112
	150.6	244.7	MDE 1510S16H08	J24
	182.0	253.0	SMDT 1510 MTL/MSL/MEL+SMDH 150-12D	J116
15.2	31.0	100.0	SMDT 1520 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1520 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	33.0	114.8	MDE 1520S16E02	J16
	45.6	115.0	MDF 1520S2D	J29
	54.0	129.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1520 MTL/MSL/MEL+SMDH 150M	J112
	57.5	148.8	MDE 1520S16H03	J24
	57.5	148.8	MDM 1520S16H03	J59
	57.8	149.1	MDW 1520HGS3	J47
	74.0	162.8	MDE 1520S16E04	J16
	85.0	159.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1520 MTL/MSL/MEL+SMDH 150L	J112
	104.0	196.8	MDE 1520S16H05	J24
	104.0	196.8	MDM 1520S16H05	J59
	104.3	197.1	MDW 1520HGS5	J47
	131.0	204.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1520 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1520 MTL/MSL/MEL+SMDH 150D	J112
	150.5	244.8	MDE 1520S16H08	J24
	182.0	253.0	SMDT 1520 MTL/MSL/MEL+SMDH 150-12D	J116
15.3	31.0	100.0	SMDT 1530 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1530 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	32.9	114.8	MDE 1530S16E02	J16
	45.9	115.0	MDF 1530S2D	J29
	54.0	129.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1530 MTL/MSL/MEL+SMDH 150M	J112
	57.4	148.8	MDE 1530S16H03	J24
	57.4	148.8	MDM 1530S16H03	J59

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø15.3 to ø15.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
15.3	57.8	149.2	MDW 1530HGS3	J47
	73.9	162.8	MDE 1530S16E04	J16
	85.0	159.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1530 MTL/MSL/MEL+SMDH 150L	J112
	103.9	196.8	MDE 1530S16H05	J24
	103.9	196.8	MDM 1530S16H05	J59
	104.3	197.2	MDW 1530HGS5	J47
	131.0	204.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1530 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1530 MTL/MSL/MEL+SMDH 150D	J112
	150.4	244.8	MDE 1530S16H08	J24
	182.0	253.0	SMDT 1530 MTL/MSL/MEL+SMDH 150-12D	J116
15.4	31.0	100.0	SMDT 1540 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1540 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	32.7	114.8	MDE 1540S16E02	J16
	46.2	115.0	MDF 1540S2D	J29
	54.0	129.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1540 MTL/MSL/MEL+SMDH 150M	J112
	57.2	148.8	MDE 1540S16H03	J24
	57.2	148.8	MDM 1540S16H03	J59
	57.6	149.2	MDW 1540HGS3	J47
	73.7	162.8	MDE 1540S16E04	J16
	85.0	159.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1540 MTL/MSL/MEL+SMDH 150L	J112
	103.7	196.8	MDE 1540S16H05	J24
	103.7	196.8	MDM 1540S16H05	J59
	104.1	197.2	MDW 1540HGS5	J47
	131.0	204.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1540 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1540 MTL/MSL/MEL+SMDH 150D	J112
	150.2	244.8	MDE 1540S16H08	J24
	182.0	253.0	SMDT 1540 MTL/MSL/MEL+SMDH 150-12D	J116
15.5	28.0	97.3	SMDT 1550 MFS+SMDH 150-1.5D	J124
	28.0	97.3	SMDT 1550 MFS+SMDH 150-1.5DF	J122
	31.0	100.0	SMDT 1550 MTL/MSL/MEL+SMDH 150-1.5D	J116
	31.0	100.0	SMDT 1550 MTL/MSL/MEL+SMDH 150-1.5DF	J114
	32.6	114.8	MDE 1550S16E02	J16
	46.5	115.0	MDF 1550S2D	J29
	46.5	210.0	MDF 1550L2D	J32
	51.0	126.6	SMDT 1550 MFS+SMDH 150-3D	J124
	51.0	126.6	SMDT 1550 MFS+SMDH 150-3DF	J122
	51.0	126.6	SMDT 1550 MFS+SMDH 150M	J120
	54.0	129.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-3D	J116
	54.0	129.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-3DF	J114
	54.0	129.2	SMDT 1550 MTL/MSL/MEL+SMDH 150M	J112
	56.4	148.1	MDW 1550PHT	J82
	57.1	148.8	MDE 1550S16H03	J24
	57.1	148.8	MDM 1550S16H03	J59
	57.1	148.8	MDW 1550HX3	J67
	57.5	149.2	MDW 1550HGS3	J47
	57.5	149.2	MDW 1550NHGS3	J96
	62.0	146.0	MDF 1550H3D	J35
	73.6	162.8	MDE 1550S16E04	J16
	82.0	156.6	SMDT 1550 MFS+SMDH 150-5D	J124
	82.0	156.6	SMDT 1550 MFS+SMDH 150-5DF	J122
	82.0	156.6	SMDT 1550 MFS+SMDH 150L	J120
	85.0	159.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-5D	J116
	85.0	159.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-5DF	J114
	85.0	159.2	SMDT 1550 MTL/MSL/MEL+SMDH 150L	J112
	93.0	194.0	MDF 1550H5D	J35
	103.6	196.8	MDE 1550S16H05	J24
	103.6	196.8	MDM 1550S16H05	J59
	103.6	196.8	MDW 1550HX5	J67
	104.0	197.2	MDW 1550HGS5	J47
	104.0	197.2	MDW 1550NHGS5	J96
	129.0	201.6	SMDT 1550 MFS+SMDH 150-8D	J124
	129.0	201.6	SMDT 1550 MFS+SMDH 150-8DF	J122
	129.0	201.6	SMDT 1550 MFS+SMDH 150D	J120
	131.0	204.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-8D	J116
	131.0	204.2	SMDT 1550 MTL/MSL/MEL+SMDH 150-8DF	J114
	131.0	204.2	SMDT 1550 MTL/MSL/MEL+SMDH 150D	J112
	150.1	244.8	MDE 1550S16H08	J24
	150.5	245.2	MDW 1550HGS8	J47
	180.0	250.4	SMDT 1550 MFS+SMDH 150-12D	J124
	182.0	253.0	SMDT 1550 MTL/MSL/MEL+SMDH 150-12D	J116
	212.6	303.8	MDW 1550XHGS10	J82
	241.6	332.8	MDW 1550XHGS12	J82

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø15.5 to ø15.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
15.5	287.6	378.8	MDW 1550XHGS15	J82
15.6	32.0	102.7	SMDT 1560 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1560 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	34.4	114.8	MDE 1560S16E02	J16
	46.8	115.0	MDF 1560S2D	J29
	57.0	134.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1560 MTL/MSL/MEL+SMDH 160M	J112
	59.4	148.8	MDE 1560S16H03	J24
	59.4	148.8	MDM 1560S16H03	J59
	59.8	149.2	MDW 1560HGS3	J47
	75.4	162.8	MDE 1560S16E04	J16
	90.0	169.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-5DF	J114
	90.0	169.4	SMDT 1560 MTL/MSL/MEL+SMDH 160L	J112
	107.4	196.8	MDE 1560S16H05	J24
	107.4	196.8	MDM 1560S16H05	J59
	107.8	197.2	MDW 1560HGS5	J47
	140.0	214.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1560 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1560 MTL/MSL/MEL+SMDH 160D	J112
	155.4	244.8	MDE 1560S16H08	J24
	194.0	265.5	SMDT 1560 MTL/MSL/MEL+SMDH 160-12D	J116
15.7	32.0	102.7	SMDT 1570 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1570 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	34.4	114.9	MDE 1570S16E02	J16
	47.1	115.0	MDF 1570S2D	J29
	57.0	134.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1570 MTL/MSL/MEL+SMDH 160M	J112
	59.4	148.9	MDE 1570S16H03	J24
	59.4	148.9	MDM 1570S16H03	J59
	59.7	149.2	MDW 1570HGS3	J47
	75.4	162.9	MDE 1570S16E04	J16
	90.0	169.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-5DF	J114
	90.0	169.4	SMDT 1570 MTL/MSL/MEL+SMDH 160L	J112
	107.4	196.9	MDE 1570S16H05	J24
	107.4	196.9	MDM 1570S16H05	J59
	107.7	197.2	MDW 1570HGS5	J47
	140.0	214.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1570 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1570 MTL/MSL/MEL+SMDH 160D	J112
	155.4	244.9	MDE 1570S16H08	J24
	194.0	265.5	SMDT 1570 MTL/MSL/MEL+SMDH 160-12D	J116
15.8	32.0	102.7	SMDT 1580 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1580 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	34.2	114.9	MDE 1580S16E02	J16
	47.4	115.0	MDF 1580S2D	J29
	57.0	134.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1580 MTL/MSL/MEL+SMDH 160M	J112
	59.2	148.9	MDE 1580S16H03	J24
	59.2	148.9	MDM 1580S16H03	J59
	59.6	149.3	MDW 1580HGS3	J47
	75.2	162.9	MDE 1580S16E04	J16
	90.0	169.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-5DF	J114
	90.0	169.4	SMDT 1580 MTL/MSL/MEL+SMDH 160L	J112
	107.2	196.9	MDE 1580S16H05	J24
	107.2	196.9	MDM 1580S16H05	J59
	107.6	197.3	MDW 1580HGS5	J47
	140.0	214.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1580 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1580 MTL/MSL/MEL+SMDH 160D	J112
	155.2	244.9	MDE 1580S16H08	J24
	194.0	265.5	SMDT 1580 MTL/MSL/MEL+SMDH 160-12D	J116
15.9	32.0	102.7	SMDT 1590 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1590 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	34.1	114.9	MDE 1590S16E02	J16
	47.7	115.0	MDF 1590S2D	J29
	57.0	134.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1590 MTL/MSL/MEL+SMDH 160M	J112
	59.1	148.9	MDE 1590S16H03	J24
	59.1	148.9	MDM 1590S16H03	J59
	59.5	149.3	MDW 1590HGS3	J48
	75.1	162.9	MDE 1590S16E04	J16
	90.0	169.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-5DF	J114

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø15.9 to ø16.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
15.9	90.0	169.4	SMDT 1590 MTL/MSL/MEL+SMDH 160L	J112
	107.1	196.9	MDE 1590S16H05	J24
	107.1	196.9	MDM 1590S16H05	J59
	107.5	197.3	MDW 1590HGS5	J48
	140.0	214.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1590 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1590 MTL/MSL/MEL+SMDH 160D	J112
	155.1	244.9	MDE 1590S16H08	J24
	194.0	265.5	SMDT 1590 MTL/MSL/MEL+SMDH 160-12D	J116
16.0	29.0	99.9	SMDT 1600 MFS+SMDH 160-1.5D	J124
	29.0	99.9	SMDT 1600 MFS+SMDH 160-1.5DF	J122
	32.0	94.0	PDL 160D2S20	J144
	32.0	102.7	SMDT 1600 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1600 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	33.9	114.9	MDE 1600S16E02	J16
	48.0	110.0	PDL 160D3S20	J144
	48.0	115.0	MDF 1600S2D	J29
	48.0	210.0	MDF 1600L2D	J32
	48.0	210.0	MDF 1600L2D-S14	J32
	54.0	131.6	SMDT 1600 MFS+SMDH 160-3D	J124
	54.0	131.6	SMDT 1600 MFS+SMDH 160-3DF	J122
	54.0	131.6	SMDT 1600 MFS+SMDH 160M	J120
	57.0	134.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1600 MTL/MSL/MEL+SMDH 160M	J112
	58.1	148.1	MDW 1600PHT	J82
	58.9	148.9	MDE 1600S16H03	J24
	58.9	148.9	MDM 1600S16H03	J59
	58.9	148.9	MDW 1600HX3	J67
	59.3	149.3	MDW 1600HGS3	J48
	59.3	149.3	MDW 1600HY3	J71
	59.3	149.3	MDW 1600NHGS3	J96
	64.0	146.0	MDF 1600H3D	J35
	74.9	162.9	MDE 1600S16E04	J16
16.0	87.0	166.6	SMDT 1600 MFS+SMDH 160-5D	J124
	87.0	166.6	SMDT 1600 MFS+SMDH 160-5DF	J122
	87.0	166.6	SMDT 1600 MFS+SMDH 160L	J120
	90.0	169.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-5DF	J114
	90.0	169.4	SMDT 1600 MTL/MSL/MEL+SMDH 160L	J112
	96.0	194.0	MDF 1600H5D	J35
	106.9	196.9	MDE 1600S16H05	J24
	106.9	196.9	MDM 1600S16H05	J59
	106.9	196.9	MDW 1600HX5	J67
	107.3	197.3	MDW 1600HGS5	J48
	107.3	197.3	MDW 1600HY5	J71
	107.3	197.3	MDW 1600NHGS5	J96
	137.0	211.6	SMDT 1600 MFS+SMDH 160-8D	J124
	137.0	211.6	SMDT 1600 MFS+SMDH 160-8DF	J122
	137.0	211.6	SMDT 1600 MFS+SMDH 160D	J120
	140.0	214.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1600 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1600 MTL/MSL/MEL+SMDH 160D	J112
	154.9	244.9	MDE 1600S16H08	J24
	155.3	245.3	MDW 1600HGS8	J48
	192.0	262.7	SMDT 1600 MFS+SMDH 160-12D	J124
	194.0	265.5	SMDT 1600 MTL/MSL/MEL+SMDH 160-12D	J116
	218.9	308.9	MDW 1600XHGS10	J82
	248.9	340.9	MDW 1600XHGS12	J82
	298.9	388.9	MDW 1600XHGS15	J82
16.1	32.0	102.7	SMDT 1610 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1610 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	57.0	134.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1610 MTL/MSL/MEL+SMDH 160M	J112
	90.0	169.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-5DF	J114
	90.0	169.4	SMDT 1610 MTL/MSL/MEL+SMDH 160L	J112
	140.0	214.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1610 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1610 MTL/MSL/MEL+SMDH 160D	J112
	194.0	265.5	SMDT 1610 MTL/MSL/MEL+SMDH 160-12D	J116
16.2	32.0	102.7	SMDT 1620 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1620 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	57.0	134.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1620 MTL/MSL/MEL+SMDH 160M	J112
	90.0	169.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-5DF	J114
	140.0	214.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-8D	J116

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø16.2 to ø16.7mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
16.2	140.0	214.4	SMDT 1620 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1620 MTL/MSL/MEL+SMDH 160D	J112
	194.0	265.5	SMDT 1620 MTL/MSL/MEL+SMDH 160-12D	J116
16.3	32.0	102.7	SMDT 1630 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1630 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	57.0	134.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1630 MTL/MSL/MEL+SMDH 160M	J112
	90.0	169.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-5DF	J114
	90.0	169.4	SMDT 1630 MTL/MSL/MEL+SMDH 160L	J112
	140.0	214.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1630 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1630 MTL/MSL/MEL+SMDH 160D	J112
	194.0	265.5	SMDT 1630 MTL/MSL/MEL+SMDH 160-12D	J116
16.4	32.0	102.7	SMDT 1640 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1640 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	57.0	134.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1640 MTL/MSL/MEL+SMDH 160M	J112
	90.0	169.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-5DF	J114
	90.0	169.4	SMDT 1640 MTL/MSL/MEL+SMDH 160L	J112
	140.0	214.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1640 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1640 MTL/MSL/MEL+SMDH 160D	J112
	194.0	265.5	SMDT 1640 MTL/MSL/MEL+SMDH 160-12D	J116
16.5	29.0	99.9	SMDT 1650 MFS+SMDH 160-1.5D	J124
	29.0	99.9	SMDT 1650 MFS+SMDH 160-1.5DF	J122
	32.0	102.7	SMDT 1650 MTL/MSL/MEL+SMDH 160-1.5D	J116
	32.0	102.7	SMDT 1650 MTL/MSL/MEL+SMDH 160-1.5DF	J114
	34.3	119.0	MDE 1650S17E02	J16
	49.5	125.0	MDF 1650S2D	J29
	49.5	220.0	MDF 1650L2D	J32
	54.0	131.6	SMDT 1650 MFS+SMDH 160-3D	J124
	54.0	131.6	SMDT 1650 MFS+SMDH 160-3DF	J122
	54.0	131.6	SMDT 1650 MFS+SMDH 160M	J120
	57.0	134.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-3D	J116
	57.0	134.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-3DF	J114
	57.0	134.4	SMDT 1650 MTL/MSL/MEL+SMDH 160M	J112
	60.8	155.0	MDE 1650S17H03	J24
	60.8	155.0	MDW 1650HX3	J67
	61.2	155.4	MDW 1650HGS3	J48
	76.3	170.0	MDE 1650S17E04	J16
	87.0	166.6	SMDT 1650 MFS+SMDH 160-5D	J124
	87.0	166.6	SMDT 1650 MFS+SMDH 160-5DF	J122
	87.0	166.6	SMDT 1650 MFS+SMDH 160L	J120
	90.0	169.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-5D	J116
	90.0	169.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-5DF	J114
	90.0	169.4	SMDT 1650 MTL/MSL/MEL+SMDH 160L	J112
	110.3	206.0	MDE 1650S17H05	J24
	110.3	206.0	MDW 1650HX5	J67
	110.7	206.4	MDW 1650HGS5	J48
	137.0	211.6	SMDT 1650 MFS+SMDH 160-8D	J124
	137.0	211.6	SMDT 1650 MFS+SMDH 160-8DF	J122
	137.0	211.6	SMDT 1650 MFS+SMDH 160D	J120
	140.0	214.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-8D	J116
	140.0	214.4	SMDT 1650 MTL/MSL/MEL+SMDH 160-8DF	J114
	140.0	214.4	SMDT 1650 MTL/MSL/MEL+SMDH 160D	J112
	192.0	262.7	SMDT 1650 MFS+SMDH 160-12D	J124
	194.0	265.5	SMDT 1650 MTL/MSL/MEL+SMDH 160-12D	J116
16.6	34.0	104.4	SMDT 1660 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1660 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	60.0	139.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1660 MTL/MSL/MEL+SMDH 170M	J112
	95.0	174.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-5D	J116
	95.0	174.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1660 MTL/MSL/MEL+SMDH 170L	J112
	148.0	224.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1660 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1660 MTL/MSL/MEL+SMDH 170D	J112
	207.0	278.1	SMDT 1660 MTL/MSL/MEL+SMDH 170-12D	J116
16.7	34.0	104.4	SMDT 1670 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1670 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	60.0	139.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1670 MTL/MSL/MEL+SMDH 170M	J112
	95.0	174.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-5D	J116
	95.0	174.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-5DF	J114

● Diameter ø16.7 to ø17.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
	95.0	174.6	SMDT 1670 MTL/MSL/MEL+SMDH 170L	J112
	148.0	224.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-8D	J116
16.7	148.0	224.6	SMDT 1670 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1670 MTL/MSL/MEL+SMDH 170D	J112
	207.0	278.1	SMDT 1670 MTL/MSL/MEL+SMDH 170-12D	J116
	34.0	104.4	SMDT 1680 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1680 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	60.0	139.6	SMDT 1680 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1680 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1680 MTL/MSL/MEL+SMDH 170M	J112
	75.9	170.1	MDE 1680S17E04	J16
16.8	95.0	174.6	SMDT 1680 MTL/MSL/MEL+SMDH 170-5D	J116
	95.0	174.6	SMDT 1680 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1680 MTL/MSL/MEL+SMDH 170L	J112
	148.0	224.6	SMDT 1680 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1680 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1680 MTL/MSL/MEL+SMDH 170D	J112
	207.0	278.1	SMDT 1680 MTL/MSL/MEL+SMDH 170-12D	J116
	34.0	104.4	SMDT 1690 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1690 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	60.0	139.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1690 MTL/MSL/MEL+SMDH 170M	J112
16.9	95.0	174.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-5D	J116
	95.0	174.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1690 MTL/MSL/MEL+SMDH 170L	J112
	148.0	224.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1690 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1690 MTL/MSL/MEL+SMDH 170D	J112
	207.0	278.1	SMDT 1690 MTL/MSL/MEL+SMDH 170-12D	J116
	31.0	101.4	SMDT 1700 MFS+SMDH 170-1.5D	J124
	31.0	101.4	SMDT 1700 MFS+SMDH 170-1.5DF	J122
	34.0	104.4	SMDT 1700 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1700 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	34.6	119.1	MDE 1700S17E02	J16
	51.0	125.0	MDF 1700S2D	J29
	51.0	220.0	MDF 1700L2D	J32
	57.0	136.6	SMDT 1700 MFS+SMDH 170-3D	J124
	57.0	136.6	SMDT 1700 MFS+SMDH 170-3DF	J122
	57.0	136.6	SMDT 1700 MFS+SMDH 170M	J120
	60.0	139.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1700 MTL/MSL/MEL+SMDH 170M	J112
	62.6	155.1	MDE 1700S17H03	J24
	62.6	155.1	MDW 1700HX3	J67
	63.0	155.5	MDW 1700HGS3	J48
17.0	75.7	170.2	MDE 1700S17E04	J16
	92.0	171.6	SMDT 1700 MFS+SMDH 170-5D	J124
	92.0	171.6	SMDT 1700 MFS+SMDH 170-5DF	J122
	92.0	171.6	SMDT 1700 MFS+SMDH 170L	J120
	95.0	174.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-5D	J116
	95.0	174.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1700 MTL/MSL/MEL+SMDH 170L	J112
	113.6	206.1	MDE 1700S17H05	J24
	113.6	206.1	MDW 1700HX5	J67
	114.0	206.5	MDW 1700HGS5	J48
	145.0	221.6	SMDT 1700 MFS+SMDH 170-8D	J124
	145.0	221.6	SMDT 1700 MFS+SMDH 170-8DF	J122
	145.0	221.6	SMDT 1700 MFS+SMDH 170D	J120
	148.0	224.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1700 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1700 MTL/MSL/MEL+SMDH 170D	J112
	204.0	275.1	SMDT 1700 MFS+SMDH 170-12D	J124
	207.0	278.1	SMDT 1700 MTL/MSL/MEL+SMDH 170-12D	J116
	34.0	104.4	SMDT 1710 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1710 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	60.0	139.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1710 MTL/MSL/MEL+SMDH 170M	J112
	65.0	161.1	MDW 1710HX3	J67
	95.0	174.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-5D	J116
17.1	95.0	174.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1710 MTL/MSL/MEL+SMDH 170L	J112
	117.5	217.1	MDW 1710HX5	J67
	148.0	224.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1710 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1710 MTL/MSL/MEL+SMDH 170D	J112
	170.0	269.1	MDW 1710HX8	J67
	207.0	278.1	SMDT 1710 MTL/MSL/MEL+SMDH 170-12D	J116
17.2	34.0	104.4	SMDT 1720 MTL/MSL/MEL+SMDH 170-1.5D	J116

● Diameter ø17.2 to ø17.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
	34.0	104.4	SMDT 1720 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	60.0	139.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1720 MTL/MSL/MEL+SMDH 170M	J112
	95.0	174.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-5D	J116
17.2	95.0	174.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1720 MTL/MSL/MEL+SMDH 170L	J112
	148.0	224.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1720 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1720 MTL/MSL/MEL+SMDH 170D	J112
	207.0	278.1	SMDT 1720 MTL/MSL/MEL+SMDH 170-12D	J116
	34.0	104.4	SMDT 1730 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1730 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	60.0	139.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1730 MTL/MSL/MEL+SMDH 170M	J112
17.3	95.0	174.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-5D	J116
	95.0	174.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1730 MTL/MSL/MEL+SMDH 170L	J112
	148.0	224.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1730 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1730 MTL/MSL/MEL+SMDH 170D	J112
	207.0	278.1	SMDT 1730 MTL/MSL/MEL+SMDH 170-12D	J116
	34.0	104.4	SMDT 1740 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1740 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	60.0	139.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1740 MTL/MSL/MEL+SMDH 170M	J112
	95.0	174.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-5D	J116
17.4	95.0	174.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1740 MTL/MSL/MEL+SMDH 170L	J112
	148.0	224.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1740 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1740 MTL/MSL/MEL+SMDH 170D	J112
	207.0	278.1	SMDT 1740 MTL/MSL/MEL+SMDH 170-12D	J116
	31.0	101.4	SMDT 1750 MFS+SMDH 170-1.5D	J124
	31.0	101.4	SMDT 1750 MFS+SMDH 170-1.5DF	J122
	34.0	104.4	SMDT 1750 MTL/MSL/MEL+SMDH 170-1.5D	J116
	34.0	104.4	SMDT 1750 MTL/MSL/MEL+SMDH 170-1.5DF	J114
	35.0	123.2	MDE 1750S18E02	J16
	52.5	130.0	MDF 1750S2D	J29
	52.5	230.0	MDF 1750L2D	J32
	57.0	136.6	SMDT 1750 MFS+SMDH 170-3D	J124
	57.0	136.6	SMDT 1750 MFS+SMDH 170-3DF	J122
	57.0	136.6	SMDT 1750 MFS+SMDH 170M	J120
	60.0	139.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-3D	J116
	60.0	139.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-3DF	J114
	60.0	139.6	SMDT 1750 MTL/MSL/MEL+SMDH 170M	J112
	64.5	161.2	MDE 1750S18H03	J24
	64.5	161.2	MDW 1750HX3	J68
	64.9	161.6	MDW 1750HGS3	J48
17.5	77.0	170.2	MDE 1750S18E04	J16
	92.0	171.6	SMDT 1750 MFS+SMDH 170-5D	J124
	92.0	171.6	SMDT 1750 MFS+SMDH 170-5DF	J122
	92.0	171.6	SMDT 1750 MFS+SMDH 170L	J120
	95.0	174.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-5D	J116
	95.0	174.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-5DF	J114
	95.0	174.6	SMDT 1750 MTL/MSL/MEL+SMDH 170L	J112
	116.9	217.3	MDE 1750S18H05	J24
	117.0	217.2	MDW 1750HX5	J68
	117.4	217.6	MDW 1750HGS5	J48
	145.0	221.6	SMDT 1750 MFS+SMDH 170-8D	J124
	145.0	221.6	SMDT 1750 MFS+SMDH 170-8DF	J122
	145.0	221.6	SMDT 1750 MFS+SMDH 170D	J120
	148.0	224.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-8D	J116
	148.0	224.6	SMDT 1750 MTL/MSL/MEL+SMDH 170-8DF	J114
	148.0	224.6	SMDT 1750 MTL/MSL/MEL+SMDH 170D	J112
	204.0	275.1	SMDT 1750 MFS+SMDH 170-12D	J124
	207.0	278.1	SMDT 1750 MTL/MSL/MEL+SMDH 170-12D	J116
	36.0	107.1	SMDT 1760 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1760 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	63.0	144.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1760 MTL/MSL/MEL+SMDH 180M	J112
17.6	100.0	179.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1760 MTL/MSL/MEL+SMDH 180L	J112
	156.0	229.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1760 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1760 MTL/MSL/MEL+SMDH 180D	J112

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø17.6 to ø18.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
17.6	219.0	290.5	SMDT 1760 MTL/MSL/MEL+SMDH 180-12D	J116
17.7	36.0	107.1	SMDT 1770 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1770 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	63.0	144.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1770 MTL/MSL/MEL+SMDH 180M	J112
	100.0	179.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1770 MTL/MSL/MEL+SMDH 180L	J112
	156.0	229.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1770 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1770 MTL/MSL/MEL+SMDH 180D	J112
	219.0	290.5	SMDT 1770 MTL/MSL/MEL+SMDH 180-12D	J116
17.8	36.0	107.1	SMDT 1780 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1780 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	63.0	144.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1780 MTL/MSL/MEL+SMDH 180M	J112
	100.0	179.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1780 MTL/MSL/MEL+SMDH 180L	J112
	156.0	229.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1780 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1780 MTL/MSL/MEL+SMDH 180D	J112
	219.0	290.5	SMDT 1780 MTL/MSL/MEL+SMDH 180-12D	J116
17.9	36.0	107.1	SMDT 1790 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1790 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	63.0	144.8	SMDT 1790 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1790 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1790 MTL/MSL/MEL+SMDH 180M	J112
	100.0	179.8	SMDT 1790 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1790 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1790 MTL/MSL/MEL+SMDH 180L	J112
	156.0	229.8	SMDT 1790 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1790 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1790 MTL/MSL/MEL+SMDH 180D	J112
	219.0	290.5	SMDT 1790 MTL/MSL/MEL+SMDH 180-12D	J116
18.0	32.0	104.0	SMDT 1800 MFS+SMDH 180-1.5D	J124
	32.0	104.0	SMDT 1800 MFS+SMDH 180-1.5DF	J122
	35.3	123.3	MDE 1800S18E02	J16
	36.0	107.1	SMDT 1800 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1800 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	54.0	130.0	MDF 1800S2D	J29
	54.0	230.0	MDF 1800L2D	J32
	54.0	230.0	MDF 1800L2D-S16	J32
	60.0	141.7	SMDT 1800 MFS+SMDH 180-3D	J124
	60.0	141.7	SMDT 1800 MFS+SMDH 180-3DF	J122
	60.0	141.7	SMDT 1800 MFS+SMDH 180M	J120
	63.0	144.8	SMDT 1800 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1800 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1800 MTL/MSL/MEL+SMDH 180M	J112
	66.3	161.3	MDE 1800S18H03	J24
	66.3	161.3	MDW 1800HX3	J68
	66.7	161.7	MDW 1800HGS3	J48
	78.3	170.3	MDE 1800S18E04	J16
	97.0	176.7	SMDT 1800 MFS+SMDH 180-5D	J124
	97.0	176.7	SMDT 1800 MFS+SMDH 180-5DF	J122
	97.0	176.7	SMDT 1800 MFS+SMDH 180L	J120
	100.0	179.8	SMDT 1800 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1800 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1800 MTL/MSL/MEL+SMDH 180L	J112
	120.3	217.3	MDE 1800S18H05	J24
	120.3	217.3	MDW 1800HX5	J68
	120.7	217.7	MDW 1800HGS5	J48
	153.0	226.7	SMDT 1800 MFS+SMDH 180-8D	J124
	153.0	226.7	SMDT 1800 MFS+SMDH 180-8DF	J122
	153.0	226.7	SMDT 1800 MFS+SMDH 180D	J120
	156.0	229.8	SMDT 1800 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1800 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1800 MTL/MSL/MEL+SMDH 180D	J112
	216.0	287.4	SMDT 1800 MFS+SMDH 180-12D	J124
	219.0	290.5	SMDT 1800 MTL/MSL/MEL+SMDH 180-12D	J116
18.1	36.0	107.1	SMDT 1810 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1810 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	63.0	144.8	SMDT 1810 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1810 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1810 MTL/MSL/MEL+SMDH 180M	J112
	100.0	179.8	SMDT 1810 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1810 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1810 MTL/MSL/MEL+SMDH 180L	J112

● Diameter ø18.1 to ø18.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
18.1	156.0	229.8	SMDT 1810 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1810 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1810 MTL/MSL/MEL+SMDH 180D	J112
	219.0	290.5	SMDT 1810 MTL/MSL/MEL+SMDH 180-12D	J116
18.2	36.0	107.1	SMDT 1820 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1820 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	63.0	144.8	SMDT 1820 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1820 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1820 MTL/MSL/MEL+SMDH 180M	J112
	100.0	179.8	SMDT 1820 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1820 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1820 MTL/MSL/MEL+SMDH 180L	J112
	156.0	229.8	SMDT 1820 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1820 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1820 MTL/MSL/MEL+SMDH 180D	J112
	219.0	290.5	SMDT 1820 MTL/MSL/MEL+SMDH 180-12D	J116
18.3	36.0	107.1	SMDT 1830 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1830 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	63.0	144.8	SMDT 1830 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1830 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1830 MTL/MSL/MEL+SMDH 180M	J112
	100.0	179.8	SMDT 1830 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1830 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1830 MTL/MSL/MEL+SMDH 180L	J112
	156.0	229.8	SMDT 1830 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1830 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1830 MTL/MSL/MEL+SMDH 180D	J112
	219.0	290.5	SMDT 1830 MTL/MSL/MEL+SMDH 180-12D	J116
18.4	36.0	107.1	SMDT 1840 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1840 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	63.0	144.8	SMDT 1840 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1840 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1840 MTL/MSL/MEL+SMDH 180M	J112
	100.0	179.8	SMDT 1840 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1840 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1840 MTL/MSL/MEL+SMDH 180L	J112
	156.0	229.8	SMDT 1840 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1840 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1840 MTL/MSL/MEL+SMDH 180D	J112
	219.0	290.5	SMDT 1840 MTL/MSL/MEL+SMDH 180-12D	J116
18.5	32.0	104.0	SMDT 1850 MFS+SMDH 180-1.5D	J124
	32.0	104.0	SMDT 1850 MFS+SMDH 180-1.5DF	J122
	34.7	126.4	MDE 1850S19E02	J16
	36.0	107.1	SMDT 1850 MTL/MSL/MEL+SMDH 180-1.5D	J116
	36.0	107.1	SMDT 1850 MTL/MSL/MEL+SMDH 180-1.5DF	J114
	55.5	140.0	MDF 1850S2D	J29
	55.5	240.0	MDF 1850L2D	J32
	60.0	141.7	SMDT 1850 MFS+SMDH 180-3D	J124
	60.0	141.7	SMDT 1850 MFS+SMDH 180-3DF	J122
	60.0	141.7	SMDT 1850 MFS+SMDH 180M	J120
	63.0	144.8	SMDT 1850 MTL/MSL/MEL+SMDH 180-3D	J116
	63.0	144.8	SMDT 1850 MTL/MSL/MEL+SMDH 180-3DF	J114
	63.0	144.8	SMDT 1850 MTL/MSL/MEL+SMDH 180M	J112
	68.2	167.4	MDE 1850S19H03	J24
	68.2	167.4	MDW 1850HX3	J68
	68.6	167.8	MDW 1850HGS3	J48
	79.7	182.4	MDE 1850S19E04	J16
	97.0	176.7	SMDT 1850 MFS+SMDH 180-5D	J124
	97.0	176.7	SMDT 1850 MFS+SMDH 180-5DF	J122
	97.0	176.7	SMDT 1850 MFS+SMDH 180L	J120
	100.0	179.8	SMDT 1850 MTL/MSL/MEL+SMDH 180-5D	J116
	100.0	179.8	SMDT 1850 MTL/MSL/MEL+SMDH 180-5DF	J114
	100.0	179.8	SMDT 1850 MTL/MSL/MEL+SMDH 180L	J112
	123.6	224.4	MDE 1850S19H05	J24
	123.7	224.4	MDW 1850HX5	J68
	124.1	224.8	MDW 1850HGS5	J48
	153.0	226.7	SMDT 1850 MFS+SMDH 180-8D	J124
	153.0	226.7	SMDT 1850 MFS+SMDH 180-8DF	J122
	153.0	226.7	SMDT 1850 MFS+SMDH 180D	J120
	156.0	229.8	SMDT 1850 MTL/MSL/MEL+SMDH 180-8D	J116
	156.0	229.8	SMDT 1850 MTL/MSL/MEL+SMDH 180-8DF	J114
	156.0	229.8	SMDT 1850 MTL/MSL/MEL+SMDH 180D	J112
	216.0	287.4	SMDT 1850 MFS+SMDH 180-12D	J124
	219.0	290.5	SMDT 1850 MTL/MSL/MEL+SMDH 180-12D	J116
18.6	37.0	114.8	SMDT 1860 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1860 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	67.0	160.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1860 MTL/MSL/MEL+SMDH 190M	J112
	106.0	195.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1860 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1860 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1860 MTL/MSL/MEL+SMDH 190-12D	J116

● Diameter ø18.6 to ø19.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
18.6	106.0	195.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1860 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1860 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1860 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1860 MTL/MSL/MEL+SMDH 190-12D	J116
18.7	37.0	114.8	SMDT 1870 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1870 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	67.0	160.0	SMDT 1870 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1870 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1870 MTL/MSL/MEL+SMDH 190M	J112
	106.0	195.0	SMDT 1870 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1870 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1870 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1870 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1870 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1870 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1870 MTL/MSL/MEL+SMDH 190-12D	J116
18.8	37.0	114.8	SMDT 1880 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1880 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	67.0	160.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1880 MTL/MSL/MEL+SMDH 190M	J112
	106.0	195.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1880 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1880 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1880 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1880 MTL/MSL/MEL+SMDH 190-12D	J116
18.9	37.0	114.8	SMDT 1890 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1890 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	67.0	160.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1890 MTL/MSL/MEL+SMDH 190M	J112
	106.0	195.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1890 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1890 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1890 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1890 MTL/MSL/MEL+SMDH 190-12D	J116
19.0	34.0	111.4	SMDT 1900 MFS+SMDH 190-1.5D	J124
	34.0	111.4	SMDT 1900 MFS+SMDH 190-1.5DF	J122
	35.0	126.5	MDE 1900S19E02	J16
	37.0	114.8	SMDT 1900 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1900 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	57.0	140.0	MDF 1900S2D	J29
	57.0	240.0	MDF 1900L2D	J32
	63.0	156.6	SMDT 1900 MFS+SMDH 190-3D	J124
	63.0	156.6	SMDT 1900 MFS+SMDH 190-3DF	J122
	63.0	156.6	SMDT 1900 MFS+SMDH 190M	J120
	67.0	160.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1900 MTL/MSL/MEL+SMDH 190M	J112
	70.0	167.5	MDE 1900S19H03	J24
	70.0	167.5	MDW 1900HX3	J68
	70.4	167.9	MDW 1900HGS3	J48
	80.9	182.4	MDE 1900S19E04	J16
	102.0	191.6	SMDT 1900 MFS+SMDH 190-5D	J124
	102.0	191.6	SMDT 1900 MFS+SMDH 190-5DF	J122
	102.0	191.6	SMDT 1900 MFS+SMDH 190L	J120
	106.0	195.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1900 MTL/MSL/MEL+SMDH 190L	J112
	127.0	224.5	MDE 1900S19H05	J24
	127.0	224.5	MDW 1900HX5	J68
	127.4	224.9	MDW 1900HGS5	J48
	161.0	251.6	SMDT 1900 MFS+SMDH 190-8D	J124
	161.0	251.6	SMDT 1900 MFS+SMDH 190-8DF	J122
	161.0	251.6	SMDT 1900 MFS+SMDH 190D	J120
	164.0	255.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1900 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1900 MTL/MSL/MEL+SMDH 190D	J112
	228.0	305.7	SMDT 1900 MFS+SMDH 190-12D	J124
	231.0	309.1	SMDT 1900 MTL/MSL/MEL+SMDH 190-12D	J116
19.1	37.0	114.8	SMDT 1910 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1910 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	67.0	160.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-3DF	J114

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø19.1 to ø19.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
19.1	67.0	160.0	SMDT 1910 MTL/MSL/MEL+SMDH 190M	J112
	106.0	195.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1910 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1910 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1910 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1910 MTL/MSL/MEL+SMDH 190-12D	J116
19.2	37.0	114.8	SMDT 1920 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1920 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	67.0	160.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1920 MTL/MSL/MEL+SMDH 190M	J112
	106.0	195.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1920 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1920 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1920 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1920 MTL/MSL/MEL+SMDH 190-12D	J116
19.3	37.0	114.8	SMDT 1930 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1930 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	67.0	160.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1930 MTL/MSL/MEL+SMDH 190M	J112
	106.0	195.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1930 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1930 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1930 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1930 MTL/MSL/MEL+SMDH 190-12D	J116
19.4	37.0	114.8	SMDT 1940 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1940 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	67.0	160.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1940 MTL/MSL/MEL+SMDH 190M	J112
	106.0	195.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1940 MTL/MSL/MEL+SMDH 190L	J112
	164.0	255.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1940 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1940 MTL/MSL/MEL+SMDH 190D	J112
	231.0	309.1	SMDT 1940 MTL/MSL/MEL+SMDH 190-12D	J116
19.5	34.0	111.4	SMDT 1950 MFS+SMDH 190-1.5D	J124
	34.0	111.4	SMDT 1950 MFS+SMDH 190-1.5DF	J122
	35.3	130.5	MDE 1950S20E02	J16
	37.0	114.8	SMDT 1950 MTL/MSL/MEL+SMDH 190-1.5D	J116
	37.0	114.8	SMDT 1950 MTL/MSL/MEL+SMDH 190-1.5DF	J114
	58.5	140.0	MDF 1950S2D	J29
	58.5	250.0	MDF 1950L2D	J32
	63.0	156.6	SMDT 1950 MFS+SMDH 190-3D	J124
	63.0	156.6	SMDT 1950 MFS+SMDH 190-3DF	J122
	63.0	156.6	SMDT 1950 MFS+SMDH 190M	J120
	67.0	160.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-3D	J116
	67.0	160.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-3DF	J114
	67.0	160.0	SMDT 1950 MTL/MSL/MEL+SMDH 190M	J112
	71.8	173.5	MDE 1950S20H03	J24
	71.8	173.5	MDW 1950HX3	J68
	72.3	174.0	MDW 1950HGS3	J48
	84.3	182.5	MDE 1950S20E04	J16
	102.0	191.6	SMDT 1950 MFS+SMDH 190-5D	J124
	102.0	191.6	SMDT 1950 MFS+SMDH 190-5DF	J122
	102.0	191.6	SMDT 1950 MFS+SMDH 190L	J120
	106.0	195.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-5D	J116
	106.0	195.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-5DF	J114
	106.0	195.0	SMDT 1950 MTL/MSL/MEL+SMDH 190L	J112
	130.3	233.5	MDE 1950S20H05	J24
	130.3	233.5	MDW 1950HX5	J68
	130.8	234.0	MDW 1950HGS5	J48
	161.0	251.6	SMDT 1950 MFS+SMDH 190-8D	J124
	161.0	251.6	SMDT 1950 MFS+SMDH 190-8DF	J122
	161.0	251.6	SMDT 1950 MFS+SMDH 190D	J120
	164.0	255.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-8D	J116
	164.0	255.0	SMDT 1950 MTL/MSL/MEL+SMDH 190-8DF	J114
	164.0	255.0	SMDT 1950 MTL/MSL/MEL+SMDH 190D	J112
	228.0	305.7	SMDT 1950 MFS+SMDH 190-12D	J124
	231.0	309.1	SMDT 1950 MTL/MSL/MEL+SMDH 190-12D	J116
19.6	39.0	117.4	SMDT 1960 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 1960 MTL/MSL/MEL+SMDH 200-1.5DF	J114

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø19.6 to ø20.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
19.6	70.0	160.1	SMDT 1960 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 1960 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 1960 MTL/MSL/MEL+SMDH 200M	J112
	111.0	200.1	SMDT 1960 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 1960 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 1960 MTL/MSL/MEL+SMDH 200L	J112
	172.0	265.1	SMDT 1960 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 1960 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 1960 MTL/MSL/MEL+SMDH 200D	J112
	243.0	321.4	SMDT 1960 MTL/MSL/MEL+SMDH 200-12D	J116
19.7	39.0	117.4	SMDT 1970 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 1970 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	70.0	160.1	SMDT 1970 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 1970 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 1970 MTL/MSL/MEL+SMDH 200M	J112
	88.1	182.6	MDE 1970S20E04	J16
	111.0	200.1	SMDT 1970 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 1970 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 1970 MTL/MSL/MEL+SMDH 200L	J112
	172.0	265.1	SMDT 1970 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 1970 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 1970 MTL/MSL/MEL+SMDH 200D	J112
	243.0	321.4	SMDT 1970 MTL/MSL/MEL+SMDH 200-12D	J116
19.8	39.0	117.4	SMDT 1980 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 1980 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	70.0	160.1	SMDT 1980 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 1980 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 1980 MTL/MSL/MEL+SMDH 200M	J112
	111.0	200.1	SMDT 1980 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 1980 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 1980 MTL/MSL/MEL+SMDH 200L	J112
	172.0	265.1	SMDT 1980 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 1980 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 1980 MTL/MSL/MEL+SMDH 200D	J112
	243.0	321.4	SMDT 1980 MTL/MSL/MEL+SMDH 200-12D	J116
19.9	39.0	117.4	SMDT 1990 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 1990 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	70.0	160.1	SMDT 1990 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 1990 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 1990 MTL/MSL/MEL+SMDH 200M	J112
	111.0	200.1	SMDT 1990 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 1990 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 1990 MTL/MSL/MEL+SMDH 200L	J112
	172.0	265.1	SMDT 1990 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 1990 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 1990 MTL/MSL/MEL+SMDH 200D	J112
	243.0	321.4	SMDT 1990 MTL/MSL/MEL+SMDH 200-12D	J116
20.0	35.0	114.0	SMDT 2000 MFS+SMDH 200-1.5D	J124
	35.0	114.0	SMDT 2000 MFS+SMDH 200-1.5DF	J122
	35.6	130.6	MDE 2000S20E02	J16
	39.0	117.4	SMDT 2000 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 2000 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	40.0	114.0	PDL 200D2S25	J144
	60.0	134.0	PDL 200D3S25	J144
	60.0	140.0	MDF 2000S2D	J29
	60.0	250.0	MDF 2000L2D	J32
	60.0	250.0	MDF 2000L2D-S18	J32
	66.0	156.7	SMDT 2000 MFS+SMDH 200-3D	J124
	66.0	156.7	SMDT 2000 MFS+SMDH 200-3DF	J122
	66.0	156.7	SMDT 2000 MFS+SMDH 200M	J120
	70.0	160.1	SMDT 2000 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 2000 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 2000 MTL/MSL/MEL+SMDH 200M	J112
20.0	73.6	173.6	MDE 2000S20H03	J24
	73.6	173.6	MDW 2000HX3	J68
	74.1	174.1	MDW 2000HGS3	J48
	87.6	182.6	MDE 2000S20E04	J16
	107.0	196.7	SMDT 2000 MFS+SMDH 200-5D	J124
	107.0	196.7	SMDT 2000 MFS+SMDH 200-5DF	J122
	107.0	196.7	SMDT 2000 MFS+SMDH 200L	J120
	111.0	200.1	SMDT 2000 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 2000 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 2000 MTL/MSL/MEL+SMDH 200L	J112
	133.6	233.6	MDE 2000S20H05	J24
	133.6	233.6	MDW 2000HX5	J68
	134.1	234.1	MDW 2000HGS5	J48
	169.0	261.7	SMDT 2000 MFS+SMDH 200-8D	J124
	169.0	261.7	SMDT 2000 MFS+SMDH 200-8DF	J122
	169.0	261.7	SMDT 2000 MFS+SMDH 200D	J120
	172.0	265.1	SMDT 2000 MTL/MSL/MEL+SMDH 200-8D	J116

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø20.0 to ø20.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
20.0	172.0	265.1	SMDT 2000 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 2000 MTL/MSL/MEL+SMDH 200D	J112
	240.0	318.0	SMDT 2000 MFS+SMDH 200-12D	J124
	243.0	321.4	SMDT 2000 MTL/MSL/MEL+SMDH 200-12D	J116
20.1	39.0	117.4	SMDT 2010 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 2010 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	70.0	160.1	SMDT 2010 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 2010 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 2010 MTL/MSL/MEL+SMDH 200M	J112
	111.0	200.1	SMDT 2010 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 2010 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 2010 MTL/MSL/MEL+SMDH 200L	J112
	172.0	265.1	SMDT 2010 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 2010 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 2010 MTL/MSL/MEL+SMDH 200D	J112
	243.0	321.4	SMDT 2010 MTL/MSL/MEL+SMDH 200-12D	J116
20.2	39.0	117.4	SMDT 2020 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 2020 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	70.0	160.1	SMDT 2020 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 2020 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 2020 MTL/MSL/MEL+SMDH 200M	J112
	111.0	200.1	SMDT 2020 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 2020 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 2020 MTL/MSL/MEL+SMDH 200L	J112
	172.0	265.1	SMDT 2020 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 2020 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 2020 MTL/MSL/MEL+SMDH 200D	J112
	243.0	321.4	SMDT 2020 MTL/MSL/MEL+SMDH 200-12D	J116
20.3	39.0	117.4	SMDT 2030 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 2030 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	70.0	160.1	SMDT 2030 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 2030 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 2030 MTL/MSL/MEL+SMDH 200M	J112
	111.0	200.1	SMDT 2030 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 2030 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 2030 MTL/MSL/MEL+SMDH 200L	J112
	172.0	265.1	SMDT 2030 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 2030 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 2030 MTL/MSL/MEL+SMDH 200D	J112
	243.0	321.4	SMDT 2030 MTL/MSL/MEL+SMDH 200-12D	J116
20.4	39.0	117.4	SMDT 2040 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 2040 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	70.0	160.1	SMDT 2040 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 2040 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 2040 MTL/MSL/MEL+SMDH 200M	J112
	111.0	200.1	SMDT 2040 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 2040 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 2040 MTL/MSL/MEL+SMDH 200L	J112
	172.0	265.1	SMDT 2040 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 2040 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 2040 MTL/MSL/MEL+SMDH 200D	J112
	243.0	321.4	SMDT 2040 MTL/MSL/MEL+SMDH 200-12D	J116
20.5	35.0	114.0	SMDT 2050 MFS+SMDH 200-1.5D	J124
	35.0	114.0	SMDT 2050 MFS+SMDH 200-1.5DF	J122
	39.0	117.4	SMDT 2050 MTL/MSL/MEL+SMDH 200-1.5D	J116
	39.0	117.4	SMDT 2050 MTL/MSL/MEL+SMDH 200-1.5DF	J114
	66.0	156.7	SMDT 2050 MFS+SMDH 200-3D	J124
	66.0	156.7	SMDT 2050 MFS+SMDH 200-3DF	J122
	66.0	156.7	SMDT 2050 MFS+SMDH 200M	J120
	70.0	160.1	SMDT 2050 MTL/MSL/MEL+SMDH 200-3D	J116
	70.0	160.1	SMDT 2050 MTL/MSL/MEL+SMDH 200-3DF	J114
	70.0	160.1	SMDT 2050 MTL/MSL/MEL+SMDH 200M	J112
	107.0	196.7	SMDT 2050 MFS+SMDH 200-5D	J124
	107.0	196.7	SMDT 2050 MFS+SMDH 200-5DF	J122
	107.0	196.7	SMDT 2050 MFS+SMDH 200L	J120
	111.0	200.1	SMDT 2050 MTL/MSL/MEL+SMDH 200-5D	J116
	111.0	200.1	SMDT 2050 MTL/MSL/MEL+SMDH 200-5DF	J114
	111.0	200.1	SMDT 2050 MTL/MSL/MEL+SMDH 200L	J112
	169.0	261.7	SMDT 2050 MFS+SMDH 200-8D	J124
	169.0	261.7	SMDT 2050 MFS+SMDH 200-8DF	J122
	169.0	261.7	SMDT 2050 MFS+SMDH 200D	J120
	172.0	265.1	SMDT 2050 MTL/MSL/MEL+SMDH 200-8D	J116
	172.0	265.1	SMDT 2050 MTL/MSL/MEL+SMDH 200-8DF	J114
	172.0	265.1	SMDT 2050 MTL/MSL/MEL+SMDH 200D	J112
	240.0	318.0	SMDT 2050 MFS+SMDH 200-12D	J124
	243.0	321.4	SMDT 2050 MTL/MSL/MEL+SMDH 200-12D	J116
20.6	41.0	119.1	SMDT 2060 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2060 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	73.0	160.3	SMDT 2060 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2060 MTL/MSL/MEL+SMDH 210-3DF	J114

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø20.6 to ø21.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
20.6	73.0	160.3	SMDT 2060 MTL/MSL/MEL+SMDH 210M	J112
	116.0	200.3	SMDT 2060 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2060 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2060 MTL/MSL/MEL+SMDH 210L	J112
	180.0	270.3	SMDT 2060 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2060 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2060 MTL/MSL/MEL+SMDH 210D	J112
	255.0	333.9	SMDT 2060 MTL/MSL/MEL+SMDH 210-12D	J116
20.7	41.0	119.1	SMDT 2070 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2070 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	73.0	160.3	SMDT 2070 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2070 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2070 MTL/MSL/MEL+SMDH 210M	J112
	116.0	200.3	SMDT 2070 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2070 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2070 MTL/MSL/MEL+SMDH 210L	J112
	180.0	270.3	SMDT 2070 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2070 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2070 MTL/MSL/MEL+SMDH 210D	J112
	255.0	333.9	SMDT 2070 MTL/MSL/MEL+SMDH 210-12D	J116
20.8	41.0	119.1	SMDT 2080 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2080 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	73.0	160.3	SMDT 2080 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2080 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2080 MTL/MSL/MEL+SMDH 210M	J112
	116.0	200.3	SMDT 2080 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2080 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2080 MTL/MSL/MEL+SMDH 210L	J112
	180.0	270.3	SMDT 2080 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2080 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2080 MTL/MSL/MEL+SMDH 210D	J112
	255.0	333.9	SMDT 2080 MTL/MSL/MEL+SMDH 210-12D	J116
20.9	41.0	119.1	SMDT 2090 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2090 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	73.0	160.3	SMDT 2090 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2090 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2090 MTL/MSL/MEL+SMDH 210M	J112
	116.0	200.3	SMDT 2090 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2090 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2090 MTL/MSL/MEL+SMDH 210L	J112
	180.0	270.3	SMDT 2090 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2090 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2090 MTL/MSL/MEL+SMDH 210D	J112
	255.0	333.9	SMDT 2090 MTL/MSL/MEL+SMDH 210-12D	J116
21.0	37.0	115.5	SMDT 2100 MFS+SMDH 210-1.5D	J124
	37.0	115.5	SMDT 2100 MFS+SMDH 210-1.5DF	J122
	41.0	119.1	SMDT 2100 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2100 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	69.0	156.7	SMDT 2100 MFS+SMDH 210-3D	J124
	69.0	156.7	SMDT 2100 MFS+SMDH 210-3DF	J122
	69.0	156.7	SMDT 2100 MFS+SMDH 210M	J120
	73.0	160.3	SMDT 2100 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2100 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2100 MTL/MSL/MEL+SMDH 210M	J112
	112.0	196.7	SMDT 2100 MFS+SMDH 210-5D	J124
	112.0	196.7	SMDT 2100 MFS+SMDH 210-5DF	J122
	112.0	196.7	SMDT 2100 MFS+SMDH 210L	J120
	116.0	200.3	SMDT 2100 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2100 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2100 MTL/MSL/MEL+SMDH 210L	J112
	177.0	266.7	SMDT 2100 MFS+SMDH 210-8D	J124
	177.0	266.7	SMDT 2100 MFS+SMDH 210-8DF	J122
	177.0	266.7	SMDT 2100 MFS+SMDH 210D	J120
	180.0	270.3	SMDT 2100 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2100 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2100 MTL/MSL/MEL+SMDH 210D	J112
	252.0	330.3	SMDT 2100 MFS+SMDH 210-12D	J124
	255.0	333.9	SMDT 2100 MTL/MSL/MEL+SMDH 210-12D	J116
21.1	41.0	119.1	SMDT 2110 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2110 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	73.0	160.3	SMDT 2110 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2110 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2110 MTL/MSL/MEL+SMDH 210M	J112
	116.0	200.3	SMDT 2110 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2110 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2110 MTL/MSL/MEL+SMDH 210L	J112
	180.0	270.3	SMDT 2110 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2110 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2110 MTL/MSL/MEL+SMDH 210D	J112
	255.0	333.9	SMDT 2110 MTL/MSL/MEL+SMDH 210-12D	J116

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø21.2 to ø21.7mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
21.2	41.0	119.1	SMDT 2120 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2120 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	73.0	160.3	SMDT 2120 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2120 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2120 MTL/MSL/MEL+SMDH 210M	J112
	116.0	200.3	SMDT 2120 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2120 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2120 MTL/MSL/MEL+SMDH 210L	J112
	180.0	270.3	SMDT 2120 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2120 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2120 MTL/MSL/MEL+SMDH 210D	J112
	255.0	333.9	SMDT 2120 MTL/MSL/MEL+SMDH 210-12D	J116
21.3	41.0	119.1	SMDT 2130 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2130 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	73.0	160.3	SMDT 2130 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2130 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2130 MTL/MSL/MEL+SMDH 210M	J112
	116.0	200.3	SMDT 2130 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2130 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2130 MTL/MSL/MEL+SMDH 210L	J112
	180.0	270.3	SMDT 2130 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2130 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2130 MTL/MSL/MEL+SMDH 210D	J112
	255.0	333.9	SMDT 2130 MTL/MSL/MEL+SMDH 210-12D	J116
21.4	41.0	119.1	SMDT 2140 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2140 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	73.0	160.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2140 MTL/MSL/MEL+SMDH 210M	J112
	116.0	200.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2140 MTL/MSL/MEL+SMDH 210L	J112
	180.0	270.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2140 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2140 MTL/MSL/MEL+SMDH 210D	J112
	255.0	333.9	SMDT 2140 MTL/MSL/MEL+SMDH 210-12D	J116
21.5	37.0	115.5	SMDT 2150 MFS+SMDH 210-1.5D	J124
	37.0	115.5	SMDT 2150 MFS+SMDH 210-1.5DF	J122
	41.0	119.1	SMDT 2150 MTL/MSL/MEL+SMDH 210-1.5D	J116
	41.0	119.1	SMDT 2150 MTL/MSL/MEL+SMDH 210-1.5DF	J114
	69.0	156.7	SMDT 2150 MFS+SMDH 210-3D	J124
	69.0	156.7	SMDT 2150 MFS+SMDH 210-3DF	J122
	69.0	156.7	SMDT 2150 MFS+SMDH 210M	J120
	73.0	160.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-3D	J116
	73.0	160.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-3DF	J114
	73.0	160.3	SMDT 2150 MTL/MSL/MEL+SMDH 210M	J112
	112.0	196.7	SMDT 2150 MFS+SMDH 210-5D	J124
	112.0	196.7	SMDT 2150 MFS+SMDH 210-5DF	J122
	112.0	196.7	SMDT 2150 MFS+SMDH 210L	J120
	116.0	200.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-5D	J116
	116.0	200.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-5DF	J114
	116.0	200.3	SMDT 2150 MTL/MSL/MEL+SMDH 210L	J112
	177.0	266.7	SMDT 2150 MFS+SMDH 210-8D	J124
	177.0	266.7	SMDT 2150 MFS+SMDH 210-8DF	J122
	177.0	266.7	SMDT 2150 MFS+SMDH 210D	J120
	180.0	270.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-8D	J116
	180.0	270.3	SMDT 2150 MTL/MSL/MEL+SMDH 210-8DF	J114
	180.0	270.3	SMDT 2150 MTL/MSL/MEL+SMDH 210D	J112
	252.0	330.3	SMDT 2150 MFS+SMDH 210-12D	J124
	255.0	333.9	SMDT 2150 MTL/MSL/MEL+SMDH 210-12D	J116
21.6	43.0	120.9	SMDT 2160 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2160 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2160 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2160 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2160 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2160 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2160 MTL/MSL/MEL+SMDH 220-12D	J117
21.7	43.0	120.9	SMDT 2170 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2170 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2170 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2170 MTL/MSL/MEL+SMDH 220L	J112

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø21.7 to ø22.3mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
21.7	191.0	275.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2170 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2170 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2170 MTL/MSL/MEL+SMDH 220-12D	J117
21.8	43.0	120.9	SMDT 2180 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2180 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2180 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2180 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2180 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2180 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2180 MTL/MSL/MEL+SMDH 220-12D	J117
21.9	43.0	120.9	SMDT 2190 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2190 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2190 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2190 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2190 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2190 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2190 MTL/MSL/MEL+SMDH 220-12D	J117
22.0	39.0	117.1	SMDT 2200 MFS+SMDH 220-1.5D	J125
	39.0	117.1	SMDT 2200 MFS+SMDH 220-1.5DF	J122
	43.0	120.9	SMDT 2200 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2200 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	73.0	161.3	SMDT 2200 MFS+SMDH 220-3D	J125
	73.0	161.3	SMDT 2200 MFS+SMDH 220-3DF	J122
	73.0	161.3	SMDT 2200 MFS+SMDH 220M	J120
	77.0	165.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2200 MTL/MSL/MEL+SMDH 220M	J112
	119.0	201.3	SMDT 2200 MFS+SMDH 220-5D	J125
	119.0	201.3	SMDT 2200 MFS+SMDH 220-5DF	J122
	119.0	201.3	SMDT 2200 MFS+SMDH 220L	J120
	123.0	205.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2200 MTL/MSL/MEL+SMDH 220L	J112
	187.0	271.3	SMDT 2200 MFS+SMDH 220-8D	J125
	187.0	271.3	SMDT 2200 MFS+SMDH 220-8DF	J122
	187.0	271.3	SMDT 2200 MFS+SMDH 220D	J120
	191.0	275.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2200 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2200 MTL/MSL/MEL+SMDH 220D	J112
	264.0	343.2	SMDT 2200 MFS+SMDH 220-12D	J125
	268.0	347.0	SMDT 2200 MTL/MSL/MEL+SMDH 220-12D	J117
22.1	43.0	120.9	SMDT 2210 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2210 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2210 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2210 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2210 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2210 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2210 MTL/MSL/MEL+SMDH 220-12D	J117
22.2	43.0	120.9	SMDT 2220 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2220 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2220 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2220 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2220 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2220 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2220 MTL/MSL/MEL+SMDH 220-12D	J117
22.3	43.0	120.9	SMDT 2230 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2230 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-3DF	J114

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø22.3 to ø22.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
22.3	77.0	165.1	SMDT 2230 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2230 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2230 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2230 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2230 MTL/MSL/MEL+SMDH 220-12D	J117
22.4	43.0	120.9	SMDT 2240 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2240 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2240 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2240 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2240 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2240 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2240 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2240 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2240 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2240 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2240 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2240 MTL/MSL/MEL+SMDH 220-12D	J117
22.5	39.0	117.1	SMDT 2250 MFS+SMDH 220-1.5D	J125
	39.0	117.1	SMDT 2250 MFS+SMDH 220-1.5DF	J122
	43.0	120.9	SMDT 2250 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2250 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	73.0	161.3	SMDT 2250 MFS+SMDH 220-3D	J125
	73.0	161.3	SMDT 2250 MFS+SMDH 220-3DF	J122
	73.0	161.3	SMDT 2250 MFS+SMDH 220M	J120
	77.0	165.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2250 MTL/MSL/MEL+SMDH 220M	J112
	119.0	201.3	SMDT 2250 MFS+SMDH 220-5D	J125
	119.0	201.3	SMDT 2250 MFS+SMDH 220-5DF	J122
	119.0	201.3	SMDT 2250 MFS+SMDH 220L	J120
	123.0	205.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2250 MTL/MSL/MEL+SMDH 220L	J112
	187.0	271.3	SMDT 2250 MFS+SMDH 220-8D	J125
	187.0	271.3	SMDT 2250 MFS+SMDH 220-8DF	J122
	187.0	271.3	SMDT 2250 MFS+SMDH 220D	J120
	191.0	275.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2250 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2250 MTL/MSL/MEL+SMDH 220D	J112
	264.0	343.2	SMDT 2250 MFS+SMDH 220-12D	J125
	268.0	347.0	SMDT 2250 MTL/MSL/MEL+SMDH 220-12D	J117
22.6	43.0	120.9	SMDT 2260 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2260 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2260 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2260 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2260 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2260 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2260 MTL/MSL/MEL+SMDH 220-12D	J117
22.7	43.0	120.9	SMDT 2270 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2270 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2270 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2270 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2270 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2270 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2270 MTL/MSL/MEL+SMDH 220-12D	J117
22.8	43.0	120.9	SMDT 2280 MTL/MSL/MEL+SMDH 220-1.5D	J117
	43.0	120.9	SMDT 2280 MTL/MSL/MEL+SMDH 220-1.5DF	J114
	77.0	165.1	SMDT 2280 MTL/MSL/MEL+SMDH 220-3D	J117
	77.0	165.1	SMDT 2280 MTL/MSL/MEL+SMDH 220-3DF	J114
	77.0	165.1	SMDT 2280 MTL/MSL/MEL+SMDH 220M	J112
	123.0	205.1	SMDT 2280 MTL/MSL/MEL+SMDH 220-5D	J117
	123.0	205.1	SMDT 2280 MTL/MSL/MEL+SMDH 220-5DF	J114
	123.0	205.1	SMDT 2280 MTL/MSL/MEL+SMDH 220L	J112
	191.0	275.1	SMDT 2280 MTL/MSL/MEL+SMDH 220-8D	J117
	191.0	275.1	SMDT 2280 MTL/MSL/MEL+SMDH 220-8DF	J114
	191.0	275.1	SMDT 2280 MTL/MSL/MEL+SMDH 220D	J112
	268.0	347.0	SMDT 2280 MTL/MSL/MEL+SMDH 220-12D	J117

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø22.9 to ø23.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
22.9	45.0	122.0	SMDT 2290 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2290 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	80.0	164.7	SMDT 2290 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2290 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2290 MTL/MSL/MEL+SMDH 230M	J112
	128.0	214.7	SMDT 2290 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2290 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2290 MTL/MSL/MEL+SMDH 230L	J112
	199.0	284.7	SMDT 2290 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2290 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2290 MTL/MSL/MEL+SMDH 230D	J112
	280.0	359.0	SMDT 2290 MTL/MSL/MEL+SMDH 230-12D	J117
23.0	40.0	118.0	SMDT 2300 MFS+SMDH 230-1.5D	J125
	40.0	118.0	SMDT 2300 MFS+SMDH 230-1.5DF	J122
	45.0	122.0	SMDT 2300 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2300 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	76.0	160.7	SMDT 2300 MFS+SMDH 230-3D	J125
	76.0	160.7	SMDT 2300 MFS+SMDH 230-3DF	J122
	76.0	160.7	SMDT 2300 MFS+SMDH 230M	J120
	80.0	164.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2300 MTL/MSL/MEL+SMDH 230M	J112
	124.0	210.7	SMDT 2300 MFS+SMDH 230-5D	J125
	124.0	210.7	SMDT 2300 MFS+SMDH 230-5DF	J122
	124.0	210.7	SMDT 2300 MFS+SMDH 230L	J120
	128.0	214.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2300 MTL/MSL/MEL+SMDH 230L	J112
	195.0	280.7	SMDT 2300 MFS+SMDH 230-8D	J125
	195.0	280.7	SMDT 2300 MFS+SMDH 230-8DF	J122
	195.0	280.7	SMDT 2300 MFS+SMDH 230D	J120
	199.0	284.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2300 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2300 MTL/MSL/MEL+SMDH 230D	J112
	276.0	355.0	SMDT 2300 MFS+SMDH 230-12D	J125
	280.0	359.0	SMDT 2300 MTL/MSL/MEL+SMDH 230-12D	J117
23.1	45.0	122.0	SMDT 2310 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2310 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	80.0	164.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2310 MTL/MSL/MEL+SMDH 230M	J112
	128.0	214.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2310 MTL/MSL/MEL+SMDH 230L	J112
	199.0	284.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2310 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2310 MTL/MSL/MEL+SMDH 230D	J112
	280.0	359.0	SMDT 2310 MTL/MSL/MEL+SMDH 230-12D	J117
23.2	45.0	122.0	SMDT 2320 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2320 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	80.0	164.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2320 MTL/MSL/MEL+SMDH 230M	J112
	128.0	214.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2320 MTL/MSL/MEL+SMDH 230L	J112
	199.0	284.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2320 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2320 MTL/MSL/MEL+SMDH 230D	J112
	280.0	359.0	SMDT 2320 MTL/MSL/MEL+SMDH 230-12D	J117
23.3	45.0	122.0	SMDT 2330 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2330 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	80.0	164.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2330 MTL/MSL/MEL+SMDH 230M	J112
	128.0	214.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2330 MTL/MSL/MEL+SMDH 230L	J112
	199.0	284.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2330 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2330 MTL/MSL/MEL+SMDH 230D	J112
	280.0	359.0	SMDT 2330 MTL/MSL/MEL+SMDH 230-12D	J117
23.4	45.0	122.0	SMDT 2340 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2340 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	80.0	164.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2340 MTL/MSL/MEL+SMDH 230M	J112
	128.0	214.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2340 MTL/MSL/MEL+SMDH 230L	J112

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø23.4 to ø24.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
23.4	199.0	284.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2340 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2340 MTL/MSL/MEL+SMDH 230D	J112
	280.0	359.0	SMDT 2340 MTL/MSL/MEL+SMDH 230-12D	J117
23.5	40.0	118.0	SMDT 2350 MFS+SMDH 230-1.5D	J125
	40.0	118.0	SMDT 2350 MFS+SMDH 230-1.5DF	J122
	45.0	122.0	SMDT 2350 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2350 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	76.0	160.7	SMDT 2350 MFS+SMDH 230-3D	J125
	76.0	160.7	SMDT 2350 MFS+SMDH 230-3DF	J122
	76.0	160.7	SMDT 2350 MFS+SMDH 230M	J120
	80.0	164.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2350 MTL/MSL/MEL+SMDH 230M	J112
	124.0	210.7	SMDT 2350 MFS+SMDH 230-5D	J125
	124.0	210.7	SMDT 2350 MFS+SMDH 230-5DF	J122
	124.0	210.7	SMDT 2350 MFS+SMDH 230L	J120
	128.0	214.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2350 MTL/MSL/MEL+SMDH 230L	J112
	195.0	280.7	SMDT 2350 MFS+SMDH 230-8D	J125
	195.0	280.7	SMDT 2350 MFS+SMDH 230-8DF	J122
	195.0	280.7	SMDT 2350 MFS+SMDH 230D	J120
	199.0	284.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2350 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2350 MTL/MSL/MEL+SMDH 230D	J112
	276.0	355.0	SMDT 2350 MFS+SMDH 230-12D	J125
	280.0	359.0	SMDT 2350 MTL/MSL/MEL+SMDH 230-12D	J117
23.6	45.0	122.0	SMDT 2360 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2360 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	80.0	164.7	SMDT 2360 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2360 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2360 MTL/MSL/MEL+SMDH 230M	J112
	128.0	214.7	SMDT 2360 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2360 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2360 MTL/MSL/MEL+SMDH 230L	J112
	199.0	284.7	SMDT 2360 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2360 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2360 MTL/MSL/MEL+SMDH 230D	J112
	280.0	359.0	SMDT 2360 MTL/MSL/MEL+SMDH 230-12D	J117
23.7	45.0	122.0	SMDT 2370 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2370 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	80.0	164.7	SMDT 2370 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2370 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2370 MTL/MSL/MEL+SMDH 230M	J112
	128.0	214.7	SMDT 2370 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2370 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2370 MTL/MSL/MEL+SMDH 230L	J112
	199.0	284.7	SMDT 2370 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2370 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2370 MTL/MSL/MEL+SMDH 230D	J112
	280.0	359.0	SMDT 2370 MTL/MSL/MEL+SMDH 230-12D	J117
23.8	45.0	122.0	SMDT 2380 MTL/MSL/MEL+SMDH 230-1.5D	J117
	45.0	122.0	SMDT 2380 MTL/MSL/MEL+SMDH 230-1.5DF	J114
	80.0	164.7	SMDT 2380 MTL/MSL/MEL+SMDH 230-3D	J117
	80.0	164.7	SMDT 2380 MTL/MSL/MEL+SMDH 230-3DF	J114
	80.0	164.7	SMDT 2380 MTL/MSL/MEL+SMDH 230M	J112
	128.0	214.7	SMDT 2380 MTL/MSL/MEL+SMDH 230-5D	J117
	128.0	214.7	SMDT 2380 MTL/MSL/MEL+SMDH 230-5DF	J114
	128.0	214.7	SMDT 2380 MTL/MSL/MEL+SMDH 230L	J112
	199.0	284.7	SMDT 2380 MTL/MSL/MEL+SMDH 230-8D	J117
	199.0	284.7	SMDT 2380 MTL/MSL/MEL+SMDH 230-8DF	J114
	199.0	284.7	SMDT 2380 MTL/MSL/MEL+SMDH 230D	J112
	280.0	359.0	SMDT 2380 MTL/MSL/MEL+SMDH 230-12D	J117
23.9	46.0	128.4	SMDT 2390 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2390 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	83.0	174.6	SMDT 2390 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2390 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2390 MTL/MSL/MEL+SMDH 240M	J112
	133.0	224.6	SMDT 2390 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2390 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2390 MTL/MSL/MEL+SMDH 240L	J112
	207.0	299.6	SMDT 2390 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2390 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2390 MTL/MSL/MEL+SMDH 240D	J112
	292.0	376.1	SMDT 2390 MTL/MSL/MEL+SMDH 240-12D	J117
24.0	42.0	124.3	SMDT 2400 MFS+SMDH 240-1.5D	J125
	42.0	124.3	SMDT 2400 MFS+SMDH 240-1.5DF	J122
	46.0	128.4	SMDT 2400 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2400 MTL/MSL/MEL+SMDH 240-1.5DF	J114

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø24.0 to ø24.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
24.0	79.0	170.5	SMDT 2400 MFS+SMDH 240-3D	J125
	79.0	170.5	SMDT 2400 MFS+SMDH 240-3DF	J122
	79.0	170.5	SMDT 2400 MFS+SMDH 240M	J120
	83.0	174.6	SMDT 2400 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2400 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2400 MTL/MSL/MEL+SMDH 240M	J112
	129.0	220.5	SMDT 2400 MFS+SMDH 240-5D	J125
	129.0	220.5	SMDT 2400 MFS+SMDH 240-5DF	J122
	129.0	220.5	SMDT 2400 MFS+SMDH 240L	J120
	133.0	224.6	SMDT 2400 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2400 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2400 MTL/MSL/MEL+SMDH 240L	J112
	203.0	295.5	SMDT 2400 MFS+SMDH 240-8D	J125
	203.0	295.5	SMDT 2400 MFS+SMDH 240-8DF	J122
	203.0	295.5	SMDT 2400 MFS+SMDH 240D	J120
	207.0	299.6	SMDT 2400 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2400 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2400 MTL/MSL/MEL+SMDH 240D	J112
	288.0	372.0	SMDT 2400 MFS+SMDH 240-12D	J125
	292.0	376.1	SMDT 2400 MTL/MSL/MEL+SMDH 240-12D	J117
24.1	46.0	128.4	SMDT 2410 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2410 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	83.0	174.6	SMDT 2410 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2410 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2410 MTL/MSL/MEL+SMDH 240M	J112
	133.0	224.6	SMDT 2410 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2410 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2410 MTL/MSL/MEL+SMDH 240L	J112
	207.0	299.6	SMDT 2410 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2410 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2410 MTL/MSL/MEL+SMDH 240D	J112
	292.0	376.1	SMDT 2410 MTL/MSL/MEL+SMDH 240-12D	J117
24.2	46.0	128.4	SMDT 2420 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2420 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	83.0	174.6	SMDT 2420 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2420 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2420 MTL/MSL/MEL+SMDH 240M	J112
	133.0	224.6	SMDT 2420 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2420 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2420 MTL/MSL/MEL+SMDH 240L	J112
	207.0	299.6	SMDT 2420 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2420 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2420 MTL/MSL/MEL+SMDH 240D	J112
	292.0	376.1	SMDT 2420 MTL/MSL/MEL+SMDH 240-12D	J117
24.3	46.0	128.4	SMDT 2430 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2430 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	83.0	174.6	SMDT 2430 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2430 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2430 MTL/MSL/MEL+SMDH 240M	J112
	133.0	224.6	SMDT 2430 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2430 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2430 MTL/MSL/MEL+SMDH 240L	J112
	207.0	299.6	SMDT 2430 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2430 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2430 MTL/MSL/MEL+SMDH 240D	J112
	292.0	376.1	SMDT 2430 MTL/MSL/MEL+SMDH 240-12D	J117
24.4	46.0	128.4	SMDT 2440 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2440 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	83.0	174.6	SMDT 2440 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2440 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2440 MTL/MSL/MEL+SMDH 240M	J112
	133.0	224.6	SMDT 2440 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2440 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2440 MTL/MSL/MEL+SMDH 240L	J112
	207.0	299.6	SMDT 2440 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2440 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2440 MTL/MSL/MEL+SMDH 240D	J112
	292.0	376.1	SMDT 2440 MTL/MSL/MEL+SMDH 240-12D	J117
24.5	42.0	124.3	SMDT 2450 MFS+SMDH 240-1.5D	J125
	42.0	124.3	SMDT 2450 MFS+SMDH 240-1.5DF	J122
	46.0	128.4	SMDT 2450 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2450 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	79.0	170.5	SMDT 2450 MFS+SMDH 240-3D	J125
	79.0	170.5	SMDT 2450 MFS+SMDH 240-3DF	J122
	79.0	170.5	SMDT 2450 MFS+SMDH 240M	J120
	83.0	174.6	SMDT 2450 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2450 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2450 MTL/MSL/MEL+SMDH 240M	J112
	90.3	173.3	SMDT 2450 MB+SMDH 240B3	J127
	129.0	220.5	SMDT 2450 MFS+SMDH 240-5D	J125

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø24.5 to ø25.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
24.5	129.0	220.5	SMDT 2450 MFS+SMDH 240-5DF	J122
	129.0	220.5	SMDT 2450 MFS+SMDH 240L	J120
	133.0	224.6	SMDT 2450 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2450 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2450 MTL/MSL/MEL+SMDH 240L	J112
	203.0	295.5	SMDT 2450 MFS+SMDH 240-8D	J125
	203.0	295.5	SMDT 2450 MFS+SMDH 240-8DF	J122
	203.0	295.5	SMDT 2450 MFS+SMDH 240D	J120
	207.0	299.6	SMDT 2450 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2450 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2450 MTL/MSL/MEL+SMDH 240D	J112
	288.0	372.0	SMDT 2450 MFS+SMDH 240-12D	J125
	292.0	376.1	SMDT 2450 MTL/MSL/MEL+SMDH 240-12D	J117
24.6	46.0	128.4	SMDT 2460 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2460 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	83.0	174.6	SMDT 2460 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2460 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2460 MTL/MSL/MEL+SMDH 240M	J112
	133.0	224.6	SMDT 2460 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2460 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2460 MTL/MSL/MEL+SMDH 240L	J112
	207.0	299.6	SMDT 2460 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2460 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2460 MTL/MSL/MEL+SMDH 240D	J112
	292.0	376.1	SMDT 2460 MTL/MSL/MEL+SMDH 240-12D	J117
24.7	46.0	128.4	SMDT 2470 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2470 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	83.0	174.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2470 MTL/MSL/MEL+SMDH 240M	J112
	90.3	173.3	SMDT 2470 MB+SMDH 240B3	J127
	133.0	224.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2470 MTL/MSL/MEL+SMDH 240L	J112
	207.0	299.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2470 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2470 MTL/MSL/MEL+SMDH 240D	J112
	292.0	376.1	SMDT 2470 MTL/MSL/MEL+SMDH 240-12D	J117
24.8	46.0	128.4	SMDT 2480 MTL/MSL/MEL+SMDH 240-1.5D	J117
	46.0	128.4	SMDT 2480 MTL/MSL/MEL+SMDH 240-1.5DF	J114
	83.0	174.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-3D	J117
	83.0	174.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-3DF	J114
	83.0	174.6	SMDT 2480 MTL/MSL/MEL+SMDH 240M	J112
	133.0	224.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-5D	J117
	133.0	224.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-5DF	J114
	133.0	224.6	SMDT 2480 MTL/MSL/MEL+SMDH 240L	J112
	207.0	299.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-8D	J117
	207.0	299.6	SMDT 2480 MTL/MSL/MEL+SMDH 240-8DF	J114
	207.0	299.6	SMDT 2480 MTL/MSL/MEL+SMDH 240D	J112
	292.0	376.1	SMDT 2480 MTL/MSL/MEL+SMDH 240-12D	J117
24.9	48.0	128.8	SMDT 2490 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2490 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	87.0	174.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2490 MTL/MSL/MEL+SMDH 250M	J112
	138.0	229.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2490 MTL/MSL/MEL+SMDH 250L	J112
	216.0	304.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2490 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2490 MTL/MSL/MEL+SMDH 250D	J112
	304.0	388.3	SMDT 2490 MTL/MSL/MEL+SMDH 250-12D	J117
25.0	43.0	124.7	SMDT 2500 MFS+SMDH 250-1.5D	J125
	43.0	124.7	SMDT 2500 MFS+SMDH 250-1.5DF	J123
	48.0	128.8	SMDT 2500 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2500 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	50.0	127.0	PDL 250D2S25	J144
	75.0	152.0	PDL 250D3S25	J144
	82.0	170.4	SMDT 2500 MFS+SMDH 250-3D	J125
	82.0	170.4	SMDT 2500 MFS+SMDH 250-3DF	J123
	82.0	170.4	SMDT 2500 MFS+SMDH 250M	J120
	87.0	174.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2500 MTL/MSL/MEL+SMDH 250M	J112
	134.0	225.4	SMDT 2500 MFS+SMDH 250-5D	J125
	134.0	225.4	SMDT 2500 MFS+SMDH 250-5DF	J123
	134.0	225.4	SMDT 2500 MFS+SMDH 250L	J120
	138.0	229.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2500 MTL/MSL/MEL+SMDH 250L	J112

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø25.0 to ø25.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
25.0	211.0	300.4	SMDT 2500 MFS+SMDH 250-8D	J125
	211.0	300.4	SMDT 2500 MFS+SMDH 250-8DF	J123
	211.0	300.4	SMDT 2500 MFS+SMDH 250D	J120
	216.0	304.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2500 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2500 MTL/MSL/MEL+SMDH 250D	J112
	300.0	384.2	SMDT 2500 MFS+SMDH 250-12D	J125
	304.0	388.3	SMDT 2500 MTL/MSL/MEL+SMDH 250-12D	J117
25.1	48.0	128.8	SMDT 2510 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2510 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	87.0	174.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2510 MTL/MSL/MEL+SMDH 250M	J112
	138.0	229.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2510 MTL/MSL/MEL+SMDH 250L	J112
	216.0	304.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2510 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2510 MTL/MSL/MEL+SMDH 250D	J112
	304.0	388.3	SMDT 2510 MTL/MSL/MEL+SMDH 250-12D	J117
25.2	48.0	128.8	SMDT 2520 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2520 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	87.0	174.5	SMDT 2520 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2520 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2520 MTL/MSL/MEL+SMDH 250M	J112
	138.0	229.5	SMDT 2520 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2520 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2520 MTL/MSL/MEL+SMDH 250L	J112
	216.0	304.5	SMDT 2520 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2520 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2520 MTL/MSL/MEL+SMDH 250D	J112
	304.0	388.3	SMDT 2520 MTL/MSL/MEL+SMDH 250-12D	J117
25.3	48.0	128.8	SMDT 2530 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2530 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	87.0	174.5	SMDT 2530 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2530 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2530 MTL/MSL/MEL+SMDH 250M	J112
	138.0	229.5	SMDT 2530 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2530 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2530 MTL/MSL/MEL+SMDH 250L	J112
	216.0	304.5	SMDT 2530 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2530 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2530 MTL/MSL/MEL+SMDH 250D	J112
	304.0	388.3	SMDT 2530 MTL/MSL/MEL+SMDH 250-12D	J117
25.4	48.0	128.8	SMDT 2540 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2540 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	87.0	174.5	SMDT 2540 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2540 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2540 MTL/MSL/MEL+SMDH 250M	J112
	138.0	229.5	SMDT 2540 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2540 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2540 MTL/MSL/MEL+SMDH 250L	J112
	216.0	304.5	SMDT 2540 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2540 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2540 MTL/MSL/MEL+SMDH 250D	J112
	304.0	388.3	SMDT 2540 MTL/MSL/MEL+SMDH 250-12D	J117
25.5	43.0	124.7	SMDT 2550 MFS+SMDH 250-1.5D	J125
	43.0	124.7	SMDT 2550 MFS+SMDH 250-1.5DF	J123
	48.0	128.8	SMDT 2550 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2550 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	82.0	170.4	SMDT 2550 MFS+SMDH 250-3D	J125
	82.0	170.4	SMDT 2550 MFS+SMDH 250-3DF	J123
	82.0	170.4	SMDT 2550 MFS+SMDH 250M	J120
	87.0	174.5	SMDT 2550 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2550 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2550 MTL/MSL/MEL+SMDH 250M	J112
	134.0	225.4	SMDT 2550 MFS+SMDH 250-5D	J125
	134.0	225.4	SMDT 2550 MFS+SMDH 250-5DF	J123
	134.0	225.4	SMDT 2550 MFS+SMDH 250L	J120
	138.0	229.5	SMDT 2550 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2550 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2550 MTL/MSL/MEL+SMDH 250L	J112
	211.0	300.4	SMDT 2550 MFS+SMDH 250-8D	J125
	211.0	300.4	SMDT 2550 MFS+SMDH 250-8DF	J123
	211.0	300.4	SMDT 2550 MFS+SMDH 250D	J120
	216.0	304.5	SMDT 2550 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2550 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2550 MTL/MSL/MEL+SMDH 250D	J112
	300.0	384.2	SMDT 2550 MFS+SMDH 250-12D	J125
	304.0	388.3	SMDT 2550 MTL/MSL/MEL+SMDH 250-12D	J117

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø25.6 to ø26.1mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
25.6	48.0	128.8	SMDT 2560 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2560 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	87.0	174.5	SMDT 2560 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2560 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2560 MTL/MSL/MEL+SMDH 250M	J112
	138.0	229.5	SMDT 2560 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2560 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2560 MTL/MSL/MEL+SMDH 250L	J112
	216.0	304.5	SMDT 2560 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2560 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2560 MTL/MSL/MEL+SMDH 250D	J112
	304.0	388.3	SMDT 2560 MTL/MSL/MEL+SMDH 250-12D	J117
25.7	48.0	128.8	SMDT 2570 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2570 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	87.0	174.5	SMDT 2570 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2570 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2570 MTL/MSL/MEL+SMDH 250M	J112
	138.0	229.5	SMDT 2570 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2570 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2570 MTL/MSL/MEL+SMDH 250L	J112
	216.0	304.5	SMDT 2570 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2570 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2570 MTL/MSL/MEL+SMDH 250D	J112
	304.0	388.3	SMDT 2570 MTL/MSL/MEL+SMDH 250-12D	J117
25.8	48.0	128.8	SMDT 2580 MTL/MSL/MEL+SMDH 250-1.5D	J117
	48.0	128.8	SMDT 2580 MTL/MSL/MEL+SMDH 250-1.5DF	J115
	87.0	174.5	SMDT 2580 MTL/MSL/MEL+SMDH 250-3D	J117
	87.0	174.5	SMDT 2580 MTL/MSL/MEL+SMDH 250-3DF	J115
	87.0	174.5	SMDT 2580 MTL/MSL/MEL+SMDH 250M	J112
	138.0	229.5	SMDT 2580 MTL/MSL/MEL+SMDH 250-5D	J117
	138.0	229.5	SMDT 2580 MTL/MSL/MEL+SMDH 250-5DF	J115
	138.0	229.5	SMDT 2580 MTL/MSL/MEL+SMDH 250L	J112
	216.0	304.5	SMDT 2580 MTL/MSL/MEL+SMDH 250-8D	J117
	216.0	304.5	SMDT 2580 MTL/MSL/MEL+SMDH 250-8DF	J115
	216.0	304.5	SMDT 2580 MTL/MSL/MEL+SMDH 250D	J112
	304.0	388.3	SMDT 2580 MTL/MSL/MEL+SMDH 250-12D	J117
25.9	50.0	131.5	SMDT 2590 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2590 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	90.0	179.7	SMDT 2590 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2590 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2590 MTL/MSL/MEL+SMDH 260M	J112
	143.0	234.7	SMDT 2590 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2590 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2590 MTL/MSL/MEL+SMDH 260L	J112
	224.0	314.7	SMDT 2590 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2590 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2590 MTL/MSL/MEL+SMDH 260D	J112
	316.0	400.8	SMDT 2590 MTL/MSL/MEL+SMDH 260-12D	J117
26.0	45.0	127.3	SMDT 2600 MFS+SMDH 260-1.5D	J125
	45.0	127.3	SMDT 2600 MFS+SMDH 260-1.5DF	J123
	50.0	131.5	SMDT 2600 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2600 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	85.0	175.5	SMDT 2600 MFS+SMDH 260-3D	J125
	85.0	175.5	SMDT 2600 MFS+SMDH 260-3DF	J123
	85.0	175.5	SMDT 2600 MFS+SMDH 260M	J120
	90.0	179.7	SMDT 2600 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2600 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2600 MTL/MSL/MEL+SMDH 260M	J112
	139.0	230.5	SMDT 2600 MFS+SMDH 260-5D	J125
	139.0	230.5	SMDT 2600 MFS+SMDH 260-5DF	J123
	139.0	230.5	SMDT 2600 MFS+SMDH 260L	J120
	143.0	234.7	SMDT 2600 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2600 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2600 MTL/MSL/MEL+SMDH 260L	J112
	219.0	310.5	SMDT 2600 MFS+SMDH 260-8D	J125
	219.0	310.5	SMDT 2600 MFS+SMDH 260-8DF	J123
	219.0	310.5	SMDT 2600 MFS+SMDH 260D	J120
	224.0	314.7	SMDT 2600 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2600 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2600 MTL/MSL/MEL+SMDH 260D	J112
	312.0	396.6	SMDT 2600 MFS+SMDH 260-12D	J125
	316.0	400.8	SMDT 2600 MTL/MSL/MEL+SMDH 260-12D	J117
26.1	50.0	131.5	SMDT 2610 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2610 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	90.0	179.7	SMDT 2610 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2610 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2610 MTL/MSL/MEL+SMDH 260M	J112
	143.0	234.7	SMDT 2610 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2610 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2610 MTL/MSL/MEL+SMDH 260L	J112

● Diameter ø26.1 to ø26.7mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
26.1	224.0	314.7	SMDT 2610 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2610 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2610 MTL/MSL/MEL+SMDH 260D	J112
	316.0	400.8	SMDT 2610 MTL/MSL/MEL+SMDH 260-12D	J117
26.2	50.0	131.5	SMDT 2620 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2620 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	90.0	179.7	SMDT 2620 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2620 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2620 MTL/MSL/MEL+SMDH 260M	J112
	143.0	234.7	SMDT 2620 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2620 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2620 MTL/MSL/MEL+SMDH 260L	J112
	224.0	314.7	SMDT 2620 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2620 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2620 MTL/MSL/MEL+SMDH 260D	J112
	316.0	400.8	SMDT 2620 MTL/MSL/MEL+SMDH 260-12D	J117
26.3	50.0	131.5	SMDT 2630 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2630 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	90.0	179.7	SMDT 2630 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2630 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2630 MTL/MSL/MEL+SMDH 260M	J112
	143.0	234.7	SMDT 2630 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2630 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2630 MTL/MSL/MEL+SMDH 260L	J112
	224.0	314.7	SMDT 2630 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2630 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2630 MTL/MSL/MEL+SMDH 260D	J112
	316.0	400.8	SMDT 2630 MTL/MSL/MEL+SMDH 260-12D	J117
26.4	50.0	131.5	SMDT 2640 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2640 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	90.0	179.7	SMDT 2640 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2640 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2640 MTL/MSL/MEL+SMDH 260M	J112
	143.0	234.7	SMDT 2640 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2640 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2640 MTL/MSL/MEL+SMDH 260L	J112
	224.0	314.7	SMDT 2640 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2640 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2640 MTL/MSL/MEL+SMDH 260D	J112
	316.0	400.8	SMDT 2640 MTL/MSL/MEL+SMDH 260-12D	J117
26.5	45.0	127.3	SMDT 2650 MFS+SMDH 260-1.5D	J125
	45.0	127.3	SMDT 2650 MFS+SMDH 260-1.5DF	J123
	50.0	131.5	SMDT 2650 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2650 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	85.0	175.5	SMDT 2650 MFS+SMDH 260-3D	J125
	85.0	175.5	SMDT 2650 MFS+SMDH 260-3DF	J123
	85.0	175.5	SMDT 2650 MFS+SMDH 260M	J120
	90.0	179.7	SMDT 2650 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2650 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2650 MTL/MSL/MEL+SMDH 260M	J112
	95.6	178.6	SMDT 2650 MB+SMDH 260B3	J127
	139.0	230.5	SMDT 2650 MFS+SMDH 260-5D	J125
	139.0	230.5	SMDT 2650 MFS+SMDH 260-5DF	J123
	139.0	230.5	SMDT 2650 MFS+SMDH 260L	J120
	143.0	234.7	SMDT 2650 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2650 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2650 MTL/MSL/MEL+SMDH 260L	J112
	219.0	310.5	SMDT 2650 MFS+SMDH 260-8D	J125
	219.0	310.5	SMDT 2650 MFS+SMDH 260-8DF	J123
	219.0	310.5	SMDT 2650 MFS+SMDH 260D	J120
	224.0	314.7	SMDT 2650 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2650 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2650 MTL/MSL/MEL+SMDH 260D	J112
	312.0	396.6	SMDT 2650 MFS+SMDH 260-12D	J125
	316.0	400.8	SMDT 2650 MTL/MSL/MEL+SMDH 260-12D	J117
26.6	50.0	131.5	SMDT 2660 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2660 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	90.0	179.7	SMDT 2660 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2660 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2660 MTL/MSL/MEL+SMDH 260M	J112
	143.0	234.7	SMDT 2660 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2660 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2660 MTL/MSL/MEL+SMDH 260L	J112
	224.0	314.7	SMDT 2660 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2660 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2660 MTL/MSL/MEL+SMDH 260D	J112
	316.0	400.8	SMDT 2660 MTL/MSL/MEL+SMDH 260-12D	J117
26.7	50.0	131.5	SMDT 2670 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2670 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	90.0	179.7	SMDT 2670 MTL/MSL/MEL+SMDH 260-3D	J117

● Diameter ø26.7 to ø27.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
26.7	90.0	179.7	SMDT 2670 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2670 MTL/MSL/MEL+SMDH 260M	J112
	95.6	178.6	SMDT 2670 MB+SMDH 260B3	J127
	143.0	234.7	SMDT 2670 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2670 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2670 MTL/MSL/MEL+SMDH 260L	J112
	224.0	314.7	SMDT 2670 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2670 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2670 MTL/MSL/MEL+SMDH 260D	J112
	316.0	400.8	SMDT 2670 MTL/MSL/MEL+SMDH 260-12D	J117
26.8	50.0	131.5	SMDT 2680 MTL/MSL/MEL+SMDH 260-1.5D	J117
	50.0	131.5	SMDT 2680 MTL/MSL/MEL+SMDH 260-1.5DF	J115
	90.0	179.7	SMDT 2680 MTL/MSL/MEL+SMDH 260-3D	J117
	90.0	179.7	SMDT 2680 MTL/MSL/MEL+SMDH 260-3DF	J115
	90.0	179.7	SMDT 2680 MTL/MSL/MEL+SMDH 260M	J112
	143.0	234.7	SMDT 2680 MTL/MSL/MEL+SMDH 260-5D	J117
	143.0	234.7	SMDT 2680 MTL/MSL/MEL+SMDH 260-5DF	J115
	143.0	234.7	SMDT 2680 MTL/MSL/MEL+SMDH 260L	J112
	224.0	314.7	SMDT 2680 MTL/MSL/MEL+SMDH 260-8D	J117
	224.0	314.7	SMDT 2680 MTL/MSL/MEL+SMDH 260-8DF	J115
	224.0	314.7	SMDT 2680 MTL/MSL/MEL+SMDH 260D	J112
	316.0	400.8	SMDT 2680 MTL/MSL/MEL+SMDH 260-12D	J117
26.9	51.0	132.2	SMDT 2690 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2690 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	93.0	179.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2690 MTL/MSL/MEL+SMDH 270M	J112
	149.0	239.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2690 MTL/MSL/MEL+SMDH 270L	J112
	232.0	324.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2690 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2690 MTL/MSL/MEL+SMDH 270D	J112
	328.0	413.3	SMDT 2690 MTL/MSL/MEL+SMDH 270-12D	J117
27.0	46.0	127.8	SMDT 2700 MFS+SMDH 270-1.5D	J125
	46.0	127.8	SMDT 2700 MFS+SMDH 270-1.5DF	J123
	51.0	132.2	SMDT 2700 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2700 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	88.0	175.5	SMDT 2700 MFS+SMDH 270-3D	J125
	88.0	175.5	SMDT 2700 MFS+SMDH 270-3DF	J123
	88.0	175.5	SMDT 2700 MFS+SMDH 270M	J120
	93.0	179.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2700 MTL/MSL/MEL+SMDH 270M	J112
	144.0	235.5	SMDT 2700 MFS+SMDH 270-5D	J125
	144.0	235.5	SMDT 2700 MFS+SMDH 270-5DF	J123
	144.0	235.5	SMDT 2700 MFS+SMDH 270L	J120
	149.0	239.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2700 MTL/MSL/MEL+SMDH 270L	J112
	227.0	320.5	SMDT 2700 MFS+SMDH 270-8D	J125
	227.0	320.5	SMDT 2700 MFS+SMDH 270-8DF	J123
	227.0	320.5	SMDT 2700 MFS+SMDH 270D	J120
	232.0	324.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2700 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2700 MTL/MSL/MEL+SMDH 270D	J112
	324.0	408.9	SMDT 2700 MFS+SMDH 270-12D	J125
	328.0	413.3	SMDT 2700 MTL/MSL/MEL+SMDH 270-12D	J117
27.1	51.0	132.2	SMDT 2710 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2710 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	93.0	179.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2710 MTL/MSL/MEL+SMDH 270M	J112
	149.0	239.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2710 MTL/MSL/MEL+SMDH 270L	J112
	232.0	324.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2710 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2710 MTL/MSL/MEL+SMDH 270D	J112
	328.0	413.3	SMDT 2710 MTL/MSL/MEL+SMDH 270-12D	J117
27.2	51.0	132.2	SMDT 2720 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2720 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	93.0	179.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2720 MTL/MSL/MEL+SMDH 270M	J112
	149.0	239.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2720 MTL/MSL/MEL+SMDH 270L	J112
	232.0	324.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2720 MTL/MSL/MEL+SMDH 270-8DF	J115

(Blue text: Flat head ■Indexable cutting edge type)

(Blue text: Flat head ■Indexable cutting edge type)

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The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø27.2 to ø27.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
27.2	232.0	324.9	SMDT 2720 MTL/MSL/MEL+SMDH 270D	J112
	328.0	413.3	SMDT 2720 MTL/MSL/MEL+SMDH 270-12D	J117
27.3	51.0	132.2	SMDT 2730 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2730 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	93.0	179.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2730 MTL/MSL/MEL+SMDH 270M	J112
	149.0	239.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2730 MTL/MSL/MEL+SMDH 270L	J112
	232.0	324.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2730 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2730 MTL/MSL/MEL+SMDH 270D	J112
	328.0	413.3	SMDT 2730 MTL/MSL/MEL+SMDH 270-12D	J117
27.4	51.0	132.2	SMDT 2740 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2740 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	93.0	179.9	SMDT 2740 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2740 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2740 MTL/MSL/MEL+SMDH 270M	J112
	149.0	239.9	SMDT 2740 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2740 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2740 MTL/MSL/MEL+SMDH 270L	J112
	232.0	324.9	SMDT 2740 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2740 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2740 MTL/MSL/MEL+SMDH 270D	J112
	328.0	413.3	SMDT 2740 MTL/MSL/MEL+SMDH 270-12D	J117
27.5	46.0	127.8	SMDT 2750 MFS+SMDH 270-1.5D	J125
	46.0	127.8	SMDT 2750 MFS+SMDH 270-1.5DF	J123
	51.0	132.2	SMDT 2750 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2750 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	88.0	175.5	SMDT 2750 MFS+SMDH 270-3D	J125
	88.0	175.5	SMDT 2750 MFS+SMDH 270-3DF	J123
	88.0	175.5	SMDT 2750 MFS+SMDH 270M	J120
	93.0	179.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2750 MTL/MSL/MEL+SMDH 270M	J112
	144.0	235.5	SMDT 2750 MFS+SMDH 270-5D	J125
	144.0	235.5	SMDT 2750 MFS+SMDH 270-5DF	J123
	144.0	235.5	SMDT 2750 MFS+SMDH 270L	J120
	149.0	239.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2750 MTL/MSL/MEL+SMDH 270L	J112
	227.0	320.5	SMDT 2750 MFS+SMDH 270-8D	J125
	227.0	320.5	SMDT 2750 MFS+SMDH 270-8DF	J123
	227.0	320.5	SMDT 2750 MFS+SMDH 270D	J120
	232.0	324.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2750 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2750 MTL/MSL/MEL+SMDH 270D	J112
	324.0	408.9	SMDT 2750 MFS+SMDH 270-12D	J125
	328.0	413.3	SMDT 2750 MTL/MSL/MEL+SMDH 270-12D	J117
27.6	51.0	132.2	SMDT 2760 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2760 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	93.0	179.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2760 MTL/MSL/MEL+SMDH 270M	J112
	149.0	239.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2760 MTL/MSL/MEL+SMDH 270L	J112
	232.0	324.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2760 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2760 MTL/MSL/MEL+SMDH 270D	J112
	328.0	413.3	SMDT 2760 MTL/MSL/MEL+SMDH 270-12D	J117
27.7	51.0	132.2	SMDT 2770 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2770 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	93.0	179.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2770 MTL/MSL/MEL+SMDH 270M	J112
	149.0	239.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-5D	J117
	149.0	239.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2770 MTL/MSL/MEL+SMDH 270L	J112
	232.0	324.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2770 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2770 MTL/MSL/MEL+SMDH 270D	J112
	328.0	413.3	SMDT 2770 MTL/MSL/MEL+SMDH 270-12D	J117
27.8	51.0	132.2	SMDT 2780 MTL/MSL/MEL+SMDH 270-1.5D	J117
	51.0	132.2	SMDT 2780 MTL/MSL/MEL+SMDH 270-1.5DF	J115
	93.0	179.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-3D	J117
	93.0	179.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-3DF	J115
	93.0	179.9	SMDT 2780 MTL/MSL/MEL+SMDH 270M	J112
	149.0	239.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-5D	J117

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø27.8 to ø28.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
27.8	149.0	239.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-5DF	J115
	149.0	239.9	SMDT 2780 MTL/MSL/MEL+SMDH 270L	J112
	232.0	324.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-8D	J117
	232.0	324.9	SMDT 2780 MTL/MSL/MEL+SMDH 270-8DF	J115
	232.0	324.9	SMDT 2780 MTL/MSL/MEL+SMDH 270D	J112
	328.0	413.3	SMDT 2780 MTL/MSL/MEL+SMDH 270-12D	J117
27.9	53.0	133.9	SMDT 2790 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2790 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	96.0	185.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2790 MTL/MSL/MEL+SMDH 280M	J112
	154.0	245.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2790 MTL/MSL/MEL+SMDH 280L	J112
	240.0	330.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2790 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2790 MTL/MSL/MEL+SMDH 280D	J112
	341.0	425.8	SMDT 2790 MTL/MSL/MEL+SMDH 280-12D	J117
28.0	48.0	129.4	SMDT 2800 MFS+SMDH 280-1.5D	J125
	48.0	129.4	SMDT 2800 MFS+SMDH 280-1.5DF	J123
	53.0	133.9	SMDT 2800 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2800 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	91.0	180.6	SMDT 2800 MFS+SMDH 280-3D	J125
	91.0	180.6	SMDT 2800 MFS+SMDH 280-3DF	J123
	91.0	180.6	SMDT 2800 MFS+SMDH 280M	J120
	96.0	185.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2800 MTL/MSL/MEL+SMDH 280M	J112
	149.0	240.6	SMDT 2800 MFS+SMDH 280-5D	J125
	149.0	240.6	SMDT 2800 MFS+SMDH 280-5DF	J123
	149.0	240.6	SMDT 2800 MFS+SMDH 280L	J120
	154.0	245.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2800 MTL/MSL/MEL+SMDH 280L	J112
	235.0	325.6	SMDT 2800 MFS+SMDH 280-8D	J125
	235.0	325.6	SMDT 2800 MFS+SMDH 280-8DF	J123
	235.0	325.6	SMDT 2800 MFS+SMDH 280D	J120
	240.0	330.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2800 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2800 MTL/MSL/MEL+SMDH 280D	J112
	336.0	421.3	SMDT 2800 MFS+SMDH 280-12D	J125
	341.0	425.8	SMDT 2800 MTL/MSL/MEL+SMDH 280-12D	J117
28.1	53.0	133.9	SMDT 2810 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2810 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	96.0	185.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2810 MTL/MSL/MEL+SMDH 280M	J112
	154.0	245.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2810 MTL/MSL/MEL+SMDH 280L	J112
	240.0	330.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2810 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2810 MTL/MSL/MEL+SMDH 280D	J112
	341.0	425.8	SMDT 2810 MTL/MSL/MEL+SMDH 280-12D	J117
28.2	53.0	133.9	SMDT 2820 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2820 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	96.0	185.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2820 MTL/MSL/MEL+SMDH 280M	J112
	154.0	245.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2820 MTL/MSL/MEL+SMDH 280L	J112
	240.0	330.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2820 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2820 MTL/MSL/MEL+SMDH 280D	J112
	341.0	425.8	SMDT 2820 MTL/MSL/MEL+SMDH 280-12D	J117
28.3	53.0	133.9	SMDT 2830 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2830 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	96.0	185.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2830 MTL/MSL/MEL+SMDH 280M	J112
	154.0	245.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2830 MTL/MSL/MEL+SMDH 280L	J112
	240.0	330.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2830 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2830 MTL/MSL/MEL+SMDH 280D	J112
	341.0	425.8	SMDT 2830 MTL/MSL/MEL+SMDH 280-12D	J117
28.4	53.0	133.9	SMDT 2840 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2840 MTL/MSL/MEL+SMDH 280-1.5DF	J115

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø28.4 to ø28.9mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
28.4	96.0	185.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2840 MTL/MSL/MEL+SMDH 280M	J112
	154.0	245.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2840 MTL/MSL/MEL+SMDH 280L	J112
	240.0	330.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2840 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2840 MTL/MSL/MEL+SMDH 280D	J112
	341.0	425.8	SMDT 2840 MTL/MSL/MEL+SMDH 280-12D	J117
28.5	48.0	129.4	SMDT 2850 MFS+SMDH 280-1.5D	J125
	48.0	129.4	SMDT 2850 MFS+SMDH 280-1.5DF	J123
	53.0	133.9	SMDT 2850 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2850 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	91.0	180.6	SMDT 2850 MFS+SMDH 280-3D	J125
	91.0	180.6	SMDT 2850 MFS+SMDH 280-3DF	J123
	91.0	180.6	SMDT 2850 MFS+SMDH 280M	J120
	96.0	185.1	SMDT 2850 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2850 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2850 MTL/MSL/MEL+SMDH 280M	J112
	149.0	240.6	SMDT 2850 MFS+SMDH 280-5D	J125
	149.0	240.6	SMDT 2850 MFS+SMDH 280-5DF	J123
	149.0	240.6	SMDT 2850 MFS+SMDH 280L	J120
	154.0	245.1	SMDT 2850 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2850 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2850 MTL/MSL/MEL+SMDH 280L	J112
	235.0	325.6	SMDT 2850 MFS+SMDH 280-8D	J125
	235.0	325.6	SMDT 2850 MFS+SMDH 280-8DF	J123
	235.0	325.6	SMDT 2850 MFS+SMDH 280D	J120
	240.0	330.1	SMDT 2850 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2850 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2850 MTL/MSL/MEL+SMDH 280D	J112
	336.0	421.3	SMDT 2850 MFS+SMDH 280-12D	J125
	341.0	425.8	SMDT 2850 MTL/MSL/MEL+SMDH 280-12D	J117
28.6	53.0	133.9	SMDT 2860 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2860 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	96.0	185.1	SMDT 2860 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2860 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2860 MTL/MSL/MEL+SMDH 280M	J112
	154.0	245.1	SMDT 2860 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2860 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2860 MTL/MSL/MEL+SMDH 280L	J112
	240.0	330.1	SMDT 2860 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2860 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2860 MTL/MSL/MEL+SMDH 280D	J112
	341.0	425.8	SMDT 2860 MTL/MSL/MEL+SMDH 280-12D	J117
28.7	53.0	133.9	SMDT 2870 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2870 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	96.0	185.1	SMDT 2870 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2870 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2870 MTL/MSL/MEL+SMDH 280M	J112
	154.0	245.1	SMDT 2870 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2870 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2870 MTL/MSL/MEL+SMDH 280L	J112
	240.0	330.1	SMDT 2870 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2870 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2870 MTL/MSL/MEL+SMDH 280D	J112
	341.0	425.8	SMDT 2870 MTL/MSL/MEL+SMDH 280-12D	J117
28.8	53.0	133.9	SMDT 2880 MTL/MSL/MEL+SMDH 280-1.5D	J117
	53.0	133.9	SMDT 2880 MTL/MSL/MEL+SMDH 280-1.5DF	J115
	96.0	185.1	SMDT 2880 MTL/MSL/MEL+SMDH 280-3D	J117
	96.0	185.1	SMDT 2880 MTL/MSL/MEL+SMDH 280-3DF	J115
	96.0	185.1	SMDT 2880 MTL/MSL/MEL+SMDH 280M	J112
	154.0	245.1	SMDT 2880 MTL/MSL/MEL+SMDH 280-5D	J117
	154.0	245.1	SMDT 2880 MTL/MSL/MEL+SMDH 280-5DF	J115
	154.0	245.1	SMDT 2880 MTL/MSL/MEL+SMDH 280L	J112
	240.0	330.1	SMDT 2880 MTL/MSL/MEL+SMDH 280-8D	J117
	240.0	330.1	SMDT 2880 MTL/MSL/MEL+SMDH 280-8DF	J115
	240.0	330.1	SMDT 2880 MTL/MSL/MEL+SMDH 280D	J112
	341.0	425.8	SMDT 2880 MTL/MSL/MEL+SMDH 280-12D	J117
28.9	55.0	135.6	SMDT 2890 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2890 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	99.0	190.3	SMDT 2890 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2890 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2890 MTL/MSL/MEL+SMDH 290M	J112
	159.0	250.3	SMDT 2890 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2890 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2890 MTL/MSL/MEL+SMDH 290L	J112
	248.0	340.3	SMDT 2890 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2890 MTL/MSL/MEL+SMDH 290-8DF	J115

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø28.9 to ø29.5mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
28.9	248.0	340.3	SMDT 2890 MTL/MSL/MEL+SMDH 290D	J112
	353.0	438.4	SMDT 2890 MTL/MSL/MEL+SMDH 290-12D	J117
29.0	49.0	130.8	SMDT 2900 MFS+SMDH 290-1.5D	J125
	49.0	130.8	SMDT 2900 MFS+SMDH 290-1.5DF	J123
	55.0	135.6	SMDT 2900 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2900 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	94.0	185.4	SMDT 2900 MFS+SMDH 290-3D	J125
	94.0	185.4	SMDT 2900 MFS+SMDH 290-3DF	J123
	94.0	185.4	SMDT 2900 MFS+SMDH 290M	J120
	99.0	190.3	SMDT 2900 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2900 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2900 MTL/MSL/MEL+SMDH 290M	J112
	154.0	245.4	SMDT 2900 MFS+SMDH 290-5D	J125
	154.0	245.4	SMDT 2900 MFS+SMDH 290-5DF	J123
	154.0	245.4	SMDT 2900 MFS+SMDH 290L	J120
	159.0	250.3	SMDT 2900 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2900 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2900 MTL/MSL/MEL+SMDH 290L	J112
	243.0	335.4	SMDT 2900 MFS+SMDH 290-8D	J125
	243.0	335.4	SMDT 2900 MFS+SMDH 290-8DF	J123
	243.0	335.4	SMDT 2900 MFS+SMDH 290D	J120
	248.0	340.3	SMDT 2900 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2900 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2900 MTL/MSL/MEL+SMDH 290D	J112
	348.0	433.5	SMDT 2900 MFS+SMDH 290-12D	J125
	353.0	438.4	SMDT 2900 MTL/MSL/MEL+SMDH 290-12D	J117
29.1	55.0	135.6	SMDT 2910 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2910 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	99.0	190.3	SMDT 2910 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2910 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2910 MTL/MSL/MEL+SMDH 290M	J112
	159.0	250.3	SMDT 2910 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2910 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2910 MTL/MSL/MEL+SMDH 290L	J112
	248.0	340.3	SMDT 2910 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2910 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2910 MTL/MSL/MEL+SMDH 290D	J112
	353.0	438.4	SMDT 2910 MTL/MSL/MEL+SMDH 290-12D	J117
29.2	55.0	135.6	SMDT 2920 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2920 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	99.0	190.3	SMDT 2920 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2920 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2920 MTL/MSL/MEL+SMDH 290M	J112
	159.0	250.3	SMDT 2920 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2920 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2920 MTL/MSL/MEL+SMDH 290L	J112
	248.0	340.3	SMDT 2920 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2920 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2920 MTL/MSL/MEL+SMDH 290D	J112
	353.0	438.4	SMDT 2920 MTL/MSL/MEL+SMDH 290-12D	J117
29.3	55.0	135.6	SMDT 2930 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2930 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	99.0	190.3	SMDT 2930 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2930 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2930 MTL/MSL/MEL+SMDH 290M	J112
	159.0	250.3	SMDT 2930 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2930 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2930 MTL/MSL/MEL+SMDH 290L	J112
	248.0	340.3	SMDT 2930 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2930 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2930 MTL/MSL/MEL+SMDH 290D	J112
	353.0	438.4	SMDT 2930 MTL/MSL/MEL+SMDH 290-12D	J117
29.4	55.0	135.6	SMDT 2940 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2940 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	99.0	190.3	SMDT 2940 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2940 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2940 MTL/MSL/MEL+SMDH 290M	J112
	159.0	250.3	SMDT 2940 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2940 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2940 MTL/MSL/MEL+SMDH 290L	J112
	248.0	340.3	SMDT 2940 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2940 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2940 MTL/MSL/MEL+SMDH 290D	J112
	353.0	438.4	SMDT 2940 MTL/MSL/MEL+SMDH 290-12D	J117
29.5	49.0	130.8	SMDT 2950 MFS+SMDH 290-1.5D	J125
	49.0	130.8	SMDT 2950 MFS+SMDH 290-1.5DF	J123
	55.0	135.6	SMDT 2950 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2950 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	94.0	185.4	SMDT 2950 MFS+SMDH 290-3D	J125
	94.0	185.4	SMDT 2950 MFS+SMDH 290-3DF	J123

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø29.5 to ø30.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
29.5	94.0	185.4	SMDT 2950 MFS+SMDH 290M	J120
	99.0	190.3	SMDT 2950 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2950 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2950 MTL/MSL/MEL+SMDH 290M	J112
	154.0	245.4	SMDT 2950 MFS+SMDH 290-5D	J125
	154.0	245.4	SMDT 2950 MFS+SMDH 290-5DF	J123
	154.0	245.4	SMDT 2950 MFS+SMDH 290L	J120
	159.0	250.3	SMDT 2950 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2950 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2950 MTL/MSL/MEL+SMDH 290L	J112
	243.0	335.4	SMDT 2950 MFS+SMDH 290-8D	J125
	243.0	335.4	SMDT 2950 MFS+SMDH 290-8DF	J123
	243.0	335.4	SMDT 2950 MFS+SMDH 290D	J120
	248.0	340.3	SMDT 2950 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2950 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2950 MTL/MSL/MEL+SMDH 290D	J112
	348.0	433.5	SMDT 2950 MFS+SMDH 290-12D	J125
	353.0	438.4	SMDT 2950 MTL/MSL/MEL+SMDH 290-12D	J117
29.6	55.0	135.6	SMDT 2960 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2960 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	99.0	190.3	SMDT 2960 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2960 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2960 MTL/MSL/MEL+SMDH 290M	J112
	159.0	250.3	SMDT 2960 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2960 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2960 MTL/MSL/MEL+SMDH 290L	J112
	248.0	340.3	SMDT 2960 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2960 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2960 MTL/MSL/MEL+SMDH 290D	J112
	353.0	438.4	SMDT 2960 MTL/MSL/MEL+SMDH 290-12D	J117
29.7	55.0	135.6	SMDT 2970 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2970 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	99.0	190.3	SMDT 2970 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2970 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2970 MTL/MSL/MEL+SMDH 290M	J112
	159.0	250.3	SMDT 2970 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2970 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2970 MTL/MSL/MEL+SMDH 290L	J112
	248.0	340.3	SMDT 2970 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2970 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2970 MTL/MSL/MEL+SMDH 290D	J112
	353.0	438.4	SMDT 2970 MTL/MSL/MEL+SMDH 290-12D	J117
29.8	55.0	135.6	SMDT 2980 MTL/MSL/MEL+SMDH 290-1.5D	J117
	55.0	135.6	SMDT 2980 MTL/MSL/MEL+SMDH 290-1.5DF	J115
	99.0	190.3	SMDT 2980 MTL/MSL/MEL+SMDH 290-3D	J117
	99.0	190.3	SMDT 2980 MTL/MSL/MEL+SMDH 290-3DF	J115
	99.0	190.3	SMDT 2980 MTL/MSL/MEL+SMDH 290M	J112
	159.0	250.3	SMDT 2980 MTL/MSL/MEL+SMDH 290-5D	J117
	159.0	250.3	SMDT 2980 MTL/MSL/MEL+SMDH 290-5DF	J115
	159.0	250.3	SMDT 2980 MTL/MSL/MEL+SMDH 290L	J112
	248.0	340.3	SMDT 2980 MTL/MSL/MEL+SMDH 290-8D	J117
	248.0	340.3	SMDT 2980 MTL/MSL/MEL+SMDH 290-8DF	J115
	248.0	340.3	SMDT 2980 MTL/MSL/MEL+SMDH 290D	J112
	353.0	438.4	SMDT 2980 MTL/MSL/MEL+SMDH 290-12D	J117
29.9	56.0	138.3	SMDT 2990 MTL/MSL/MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 2990 MTL/MSL/MEL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 2990 MTL/MSL/MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 2990 MTL/MSL/MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 2990 MTL/MSL/MEL+SMDH 300M	J113
	164.0	260.5	SMDT 2990 MTL/MSL/MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 2990 MTL/MSL/MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 2990 MTL/MSL/MEL+SMDH 300L	J113
	257.0	350.5	SMDT 2990 MTL/MSL/MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 2990 MTL/MSL/MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 2990 MTL/MSL/MEL+SMDH 300D	J113
	365.0	450.8	SMDT 2990 MTL/MSL/MEL+SMDH 300-12D	J117
30.0	51.0	133.4	SMDT 3000 MFS+SMDH 300-1.5D	J125
	51.0	133.4	SMDT 3000 MFS+SMDH 300-1.5DF	J123
	56.0	138.3	SMDT 3000 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3000 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3000 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3000 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3000 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3000 MTL+SMDH 300-1.5DF	J115
	97.0	185.6	SMDT 3000 MFS+SMDH 300-3D	J125
	97.0	185.6	SMDT 3000 MFS+SMDH 300-3DF	J123
	97.0	185.6	SMDT 3000 MFS+SMDH 300M	J121
	103.0	190.5	SMDT 3000 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3000 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3000 MEL+SMDH 300M	J113

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø30.0 to ø30.2mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
30.0	103.0	190.5	SMDT 3000 MSL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3000 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3000 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3000 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3000 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3000 MTL+SMDH 300M	J113
	159.0	255.6	SMDT 3000 MFS+SMDH 300-5D	J125
	159.0	255.6	SMDT 3000 MFS+SMDH 300-5DF	J123
	159.0	255.6	SMDT 3000 MFS+SMDH 300L	J121
	164.0	260.5	SMDT 3000 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3000 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3000 MEL+SMDH 300L	J113
	164.0	260.5	SMDT 3000 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3000 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3000 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3000 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3000 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3000 MTL+SMDH 300L	J113
	251.0	345.6	SMDT 3000 MFS+SMDH 300-8D	J125
	251.0	345.6	SMDT 3000 MFS+SMDH 300-8DF	J123
	251.0	345.6	SMDT 3000 MFS+SMDH 300D	J121
	257.0	350.5	SMDT 3000 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3000 MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3000 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3000 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3000 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3000 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3000 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3000 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3000 MTL+SMDH 300D	J113
	360.0	445.9	SMDT 3000 MFS+SMDH 300-12D	J125
	365.0	450.8	SMDT 3000 MEL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3000 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3000 MTL+SMDH 300-12D	J117
30.1	56.0	138.3	SMDT 3010 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3010 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3010 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3010 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3010 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3010 MTL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 3010 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3010 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3010 MEL+SMDH 300M	J113
	103.0	190.5	SMDT 3010 MSL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3010 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3010 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3010 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3010 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3010 MTL+SMDH 300M	J113
	164.0	260.5	SMDT 3010 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3010 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3010 MEL+SMDH 300L	J113
	164.0	260.5	SMDT 3010 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3010 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3010 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3010 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3010 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3010 MTL+SMDH 300L	J113
	257.0	350.5	SMDT 3010 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3010 MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3010 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3010 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3010 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3010 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3010 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3010 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3010 MTL+SMDH 300D	J113
	365.0	450.8	SMDT 3010 MEL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3010 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3010 MTL+SMDH 300-12D	J117
30.2	56.0	138.3	SMDT 3020 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3020 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3020 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3020 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3020 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3020 MTL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 3020 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3020 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3020 MEL+SMDH 300M	J113
	103.0	190.5	SMDT 3020 MSL+SMDH 300-3D	J117

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø30.2 to ø30.4mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
30.2	103.0	190.5	SMDT 3020 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3020 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3020 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3020 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3020 MTL+SMDH 300M	J113
	164.0	260.5	SMDT 3020 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3020 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3020 MEL+SMDH 300L	J113
	164.0	260.5	SMDT 3020 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3020 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3020 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3020 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3020 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3020 MTL+SMDH 300L	J113
	257.0	350.5	SMDT 3020 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3020 MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3020 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3020 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3020 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3020 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3020 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3020 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3020 MTL+SMDH 300D	J113
	365.0	450.8	SMDT 3020 MEL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3020 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3020 MTL+SMDH 300-12D	J117
30.3	56.0	138.3	SMDT 3030 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3030 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3030 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3030 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3030 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3030 MTL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 3030 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3030 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3030 MEL+SMDH 300M	J113
	103.0	190.5	SMDT 3030 MSL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3030 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3030 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3030 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3030 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3030 MTL+SMDH 300M	J113
	164.0	260.5	SMDT 3030 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3030 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3030 MEL+SMDH 300L	J113
	164.0	260.5	SMDT 3030 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3030 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3030 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3030 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3030 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3030 MTL+SMDH 300L	J113
	257.0	350.5	SMDT 3030 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3030 MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3030 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3030 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3030 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3030 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3030 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3030 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3030 MTL+SMDH 300D	J113
	365.0	450.8	SMDT 3030 MEL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3030 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3030 MTL+SMDH 300-12D	J117
30.4	56.0	138.3	SMDT 3040 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3040 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3040 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3040 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3040 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3040 MTL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 3040 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3040 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3040 MEL+SMDH 300M	J113
	103.0	190.5	SMDT 3040 MSL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3040 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3040 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3040 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3040 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3040 MTL+SMDH 300M	J113
	164.0	260.5	SMDT 3040 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3040 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3040 MEL+SMDH 300L	J113

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø30.4 to ø30.6mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
30.4	164.0	260.5	SMDT 3040 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3040 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3040 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3040 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3040 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3040 MTL+SMDH 300L	J113
	257.0	350.5	SMDT 3040 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3040 MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3040 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3040 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3040 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3040 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3040 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3040 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3040 MTL+SMDH 300D	J113
	365.0	450.8	SMDT 3040 MEL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3040 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3040 MTL+SMDH 300-12D	J117
30.5	56.0	138.3	SMDT 3050 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3050 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3050 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3050 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3050 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3050 MTL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 3050 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3050 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3050 MEL+SMDH 300M	J113
	103.0	190.5	SMDT 3050 MSL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3050 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3050 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3050 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3050 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3050 MTL+SMDH 300M	J113
	164.0	260.5	SMDT 3050 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3050 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3050 MEL+SMDH 300L	J113
	164.0	260.5	SMDT 3050 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3050 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3050 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3050 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3050 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3050 MTL+SMDH 300L	J113
	257.0	350.5	SMDT 3050 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3050 MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3050 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3050 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3050 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3050 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3050 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3050 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3050 MTL+SMDH 300D	J113
	365.0	450.8	SMDT 3050 MEL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3050 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3050 MTL+SMDH 300-12D	J117
30.6	56.0	138.3	SMDT 3060 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3060 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3060 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3060 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3060 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3060 MTL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 3060 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3060 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3060 MEL+SMDH 300M	J113
	103.0	190.5	SMDT 3060 MSL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3060 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3060 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3060 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3060 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3060 MTL+SMDH 300M	J113
	164.0	260.5	SMDT 3060 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3060 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3060 MEL+SMDH 300L	J113
	164.0	260.5	SMDT 3060 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3060 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3060 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3060 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3060 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3060 MTL+SMDH 300L	J113
	257.0	350.5	SMDT 3060 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3060 MEL+SMDH 300-8DF	J115

(Blue text: Flat head ■Indexable cutting edge type)

● Diameter ø30.6 to ø30.8mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
30.6	257.0	350.5	SMDT 3060 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3060 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3060 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3060 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3060 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3060 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3060 MTL+SMDH 300D	J113
	365.0	450.8	SMDT 3060 MEL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3060 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3060 MTL+SMDH 300-12D	J117
30.7	56.0	138.3	SMDT 3070 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3070 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3070 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3070 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3070 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3070 MTL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 3070 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3070 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3070 MEL+SMDH 300M	J113
	103.0	190.5	SMDT 3070 MSL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3070 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3070 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3070 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3070 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3070 MTL+SMDH 300M	J113
	164.0	260.5	SMDT 3070 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3070 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3070 MEL+SMDH 300L	J113
	164.0	260.5	SMDT 3070 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3070 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3070 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3070 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3070 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3070 MTL+SMDH 300L	J113
	257.0	350.5	SMDT 3070 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3070 MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3070 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3070 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3070 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3070 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3070 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3070 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3070 MTL+SMDH 300D	J113
	365.0	450.8	SMDT 3070 MEL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3070 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3070 MTL+SMDH 300-12D	J117
30.8	56.0	138.3	SMDT 3080 MEL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3080 MEL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3080 MSL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3080 MSL+SMDH 300-1.5DF	J115
	56.0	138.3	SMDT 3080 MTL+SMDH 300-1.5D	J117
	56.0	138.3	SMDT 3080 MTL+SMDH 300-1.5DF	J115
	103.0	190.5	SMDT 3080 MEL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3080 MEL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3080 MEL+SMDH 300M	J113
	103.0	190.5	SMDT 3080 MSL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3080 MSL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3080 MSL+SMDH 300M	J113
	103.0	190.5	SMDT 3080 MTL+SMDH 300-3D	J117
	103.0	190.5	SMDT 3080 MTL+SMDH 300-3DF	J115
	103.0	190.5	SMDT 3080 MTL+SMDH 300M	J113
	164.0	260.5	SMDT 3080 MEL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3080 MEL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3080 MEL+SMDH 300L	J113
	164.0	260.5	SMDT 3080 MSL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3080 MSL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3080 MSL+SMDH 300L	J113
	164.0	260.5	SMDT 3080 MTL+SMDH 300-5D	J117
	164.0	260.5	SMDT 3080 MTL+SMDH 300-5DF	J115
	164.0	260.5	SMDT 3080 MTL+SMDH 300L	J113
	257.0	350.5	SMDT 3080 MEL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3080 MEL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3080 MEL+SMDH 300D	J113
	257.0	350.5	SMDT 3080 MSL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3080 MSL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3080 MSL+SMDH 300D	J113
	257.0	350.5	SMDT 3080 MTL+SMDH 300-8D	J117
	257.0	350.5	SMDT 3080 MTL+SMDH 300-8DF	J115
	257.0	350.5	SMDT 3080 MTL+SMDH 300D	J113
	365.0	450.8	SMDT 3080 MEL+SMDH 300-12D	J117

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

Effective Length List by Diameter

● Diameter ø30.8 to ø42.0mm

Dia. DC	Effective Length LU	Overall Length OAL	Cat. No.	Page
30.8	365.0	450.8	SMDT 3080 MSL+SMDH 300-12D	J117
	365.0	450.8	SMDT 3080 MTL+SMDH 300-12D	J117
31.0	106.0	200.7	SMDT 3100 MTL+SMDH 320M	J113
	170.0	265.8	SMDT 3100 MTL+SMDH 320L	J113
	266.0	360.8	SMDT 3100 MTL+SMDH 320D	J113
32.0	64.0	162.0	PDL 320D2S40	J144
	96.0	194.0	PDL 320D3S40	J144
	106.0	200.7	SMDT 3200 MTL+SMDH 320M	J113
	170.0	265.8	SMDT 3200 MTL+SMDH 320L	J113
	266.0	360.8	SMDT 3200 MTL+SMDH 320D	J113
33.0	111.0	205.9	SMDT 3300 MTL+SMDH 335M	J113
	178.0	274.1	SMDT 3300 MTL+SMDH 335L	J113
	279.0	376.1	SMDT 3300 MTL+SMDH 335D	J113
34.0	116.0	221.2	SMDT 3400 MTL+SMDH 350M	J113
	186.0	296.4	SMDT 3400 MTL+SMDH 350L	J113
	291.0	401.4	SMDT 3400 MTL+SMDH 350D	J113
35.0	116.0	221.2	SMDT 3500 MTL+SMDH 350M	J113
	186.0	296.4	SMDT 3500 MTL+SMDH 350L	J113
	291.0	401.4	SMDT 3500 MTL+SMDH 350D	J113
36.0	121.0	226.4	SMDT 3600 MTL+SMDH 365M	J113
	194.0	301.6	SMDT 3600 MTL+SMDH 365L	J113
	303.0	411.6	SMDT 3600 MTL+SMDH 365D	J113
37.0	125.0	231.7	SMDT 3700 MTL+SMDH 380M	J113
	201.0	311.9	SMDT 3700 MTL+SMDH 380L	J113
	315.0	426.9	SMDT 3700 MTL+SMDH 380D	J113
37.5	125.0	231.7	SMDT 3750 MTL+SMDH 380M	J113
	201.0	311.9	SMDT 3750 MTL+SMDH 380L	J113
	315.0	426.9	SMDT 3750 MTL+SMDH 380D	J113
38.0	125.0	231.7	SMDT 3800 MTL+SMDH 380M	J113
	201.0	311.9	SMDT 3800 MTL+SMDH 380L	J113
	315.0	426.9	SMDT 3800 MTL+SMDH 380D	J113
39.0	130.0	237.0	SMDT 3900 MTL+SMDH 395M	J113
	209.0	322.2	SMDT 3900 MTL+SMDH 395L	J113
	328.0	437.2	SMDT 3900 MTL+SMDH 395D	J113
40.0	80.0	185.0	PDL 400D2S40	J144
	120.0	225.0	PDL 400D3S40	J144
	135.0	252.2	SMDT 4000 MTL+SMDH 410M	J113
	217.0	332.5	SMDT 4000 MTL+SMDH 410L	J113
	340.0	457.5	SMDT 4000 MTL+SMDH 410D	J113
40.5	135.0	252.2	SMDT 4050 MTL+SMDH 410M	J113
	217.0	332.5	SMDT 4050 MTL+SMDH 410L	J113
	340.0	457.5	SMDT 4050 MTL+SMDH 410D	J113
41.0	135.0	252.2	SMDT 4100 MTL+SMDH 410M	J113
	217.0	332.5	SMDT 4100 MTL+SMDH 410L	J113
	340.0	457.5	SMDT 4100 MTL+SMDH 410D	J113
42.0	140.0	257.5	SMDT 4200 MTL+SMDH 425M	J113
	225.0	342.7	SMDT 4200 MTL+SMDH 425L	J113
	352.0	467.7	SMDT 4200 MTL+SMDH 425D	J113

(Blue text: Flat head ■Indexable cutting edge type)

The effective length (LU) is a guideline for the usable length. Take into account the chip evacuation in relation to the flute length (LCF) when drilling.

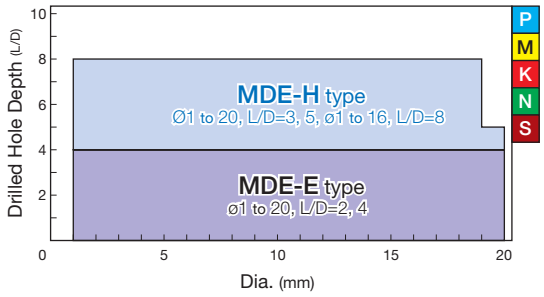
MEMO

Application Range of Major Drills

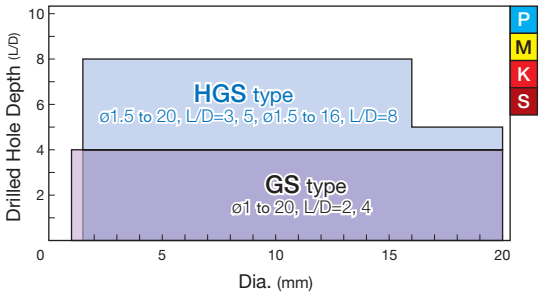
Coolant: **External supply** / Internal supply

■ Solid Carbide Drills

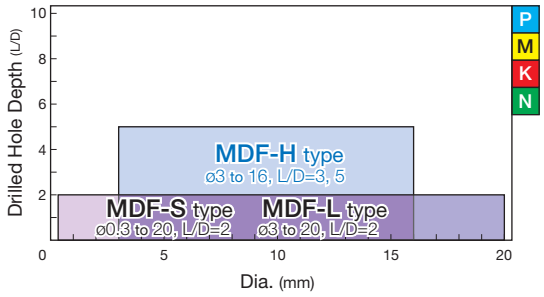
General-purpose MULTIDRILL NeXEO MDE series J8



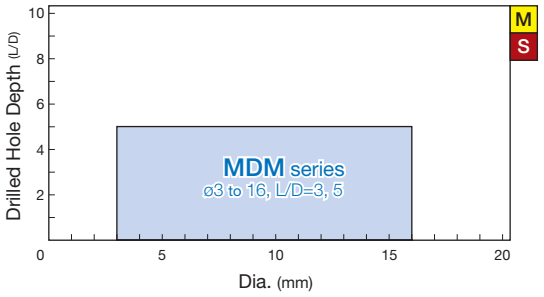
GS/HGS type for General-purpose High-efficiency Drilling J38



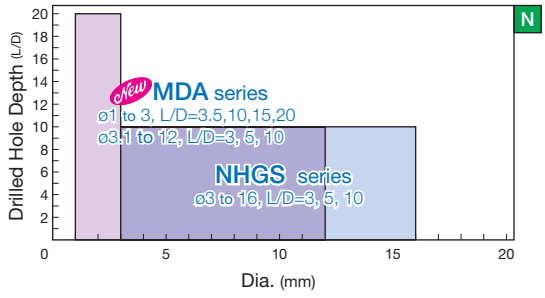
Flat MULTIDRILL MDF series J26



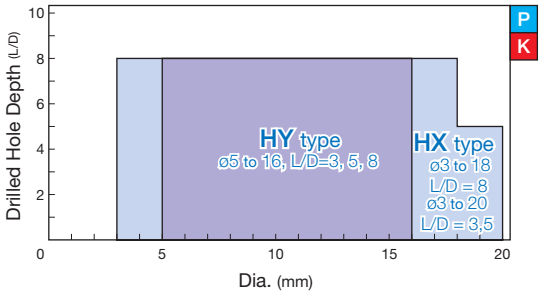
MDM series for Stainless Steel and Exotic Alloy Drilling J52



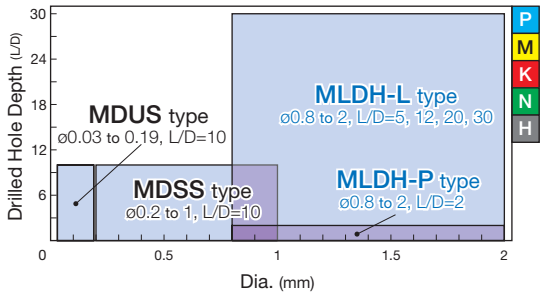
MDA series for Non-Ferrous Metal Drilling J84
NHGS series for High-efficiency Drilling of Aluminum Alloy J92



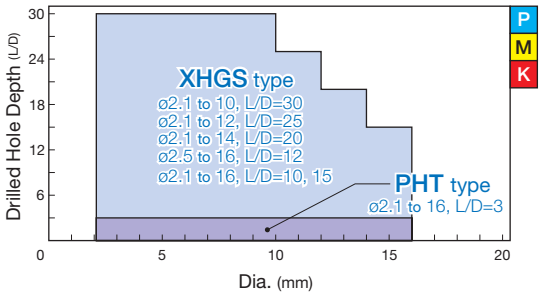
For Steel / Cast Iron: HX type J62
For High-efficiency Drilling: HY type J70



Small Diameter Long Drill MLDH-L type / MLDH-P type J99
MDUS type / MDSS type Very Small Diameter Drills J102

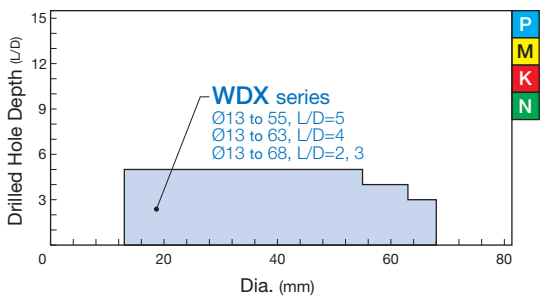


XHGS/PHT type for High-efficiency Deep Hole Drilling J76



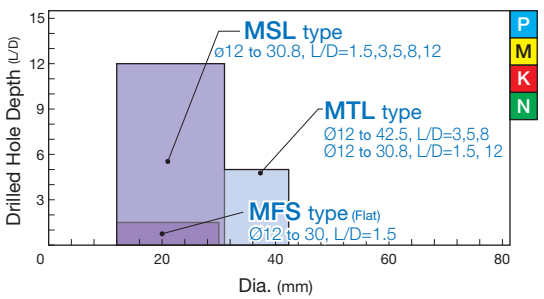
■ Indexable Insert type Drills

SumiDrill WDX series J128



■ Indexable Head Drills

SEC-MULTIDRILL SMD series
MTL type Head / MSL type Head / MFS type Head J104



MEMO

Drill Coating

General-purpose grade

ACT100
ACT70

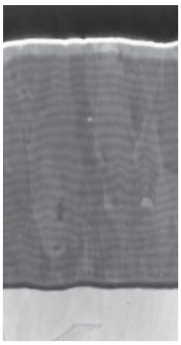
MULTIDRILL NeXEO
- Next for Everyone -

NX Coat

■ General Features

● Sumitomo Electric Hardmetal's proprietary nano-coating technology provides stable tool life under a wide range of cutting conditions with a variety of work materials.

● Coating Structure

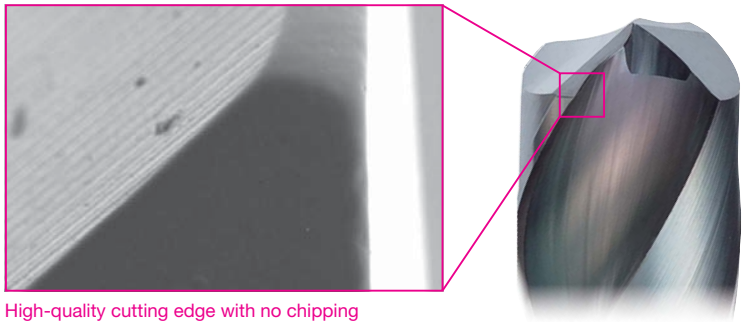


■ Features

● High-quality, high-hardness, high-strength coating based on ABSOTECH™ technology achieves excellent wear and thermal resistance.

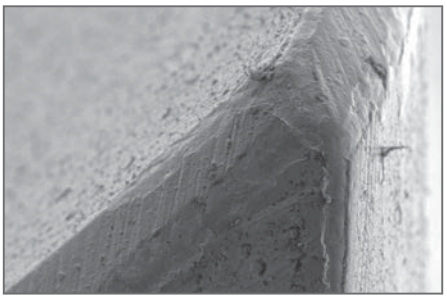
● Resistant to shoulder chipping ● High-quality edge provides stable tool life

NeXEO MDE series



High-quality cutting edge with no chipping

Competitor's Product A



Chipping in edge coating

DEX Coat

■ General Features

Sumitomo Electric Hardmetal's dedicated coating for drills utilises nano-coating technology to provide long tool life.

■ Features

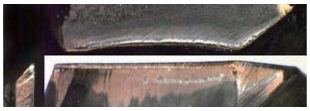
● Coating Structure
World's first compound super multi-layered coating made from alternate layers of two super multi-layered substrates.

Cross section SEM image

● Silicon and chrome improve wear, thermal and adhesion resistance.

● Super multi-layered structure offers improved chipping resistance

■ DEX Coat Application Examples

MULTIDRILL GS series with DEX Coat (after drilling 100 holes)	
Competitor's Product A (after 70m of machining)	

Tool : MDW 0800GS4
Work Material : S50C (200HB)
Cutting Conditions : vc = 70m/min, f = 0.25mm/rev, H = 32mm, external coolant supply (water soluble)

Drill Coating

AURORA Coat X DLX1700

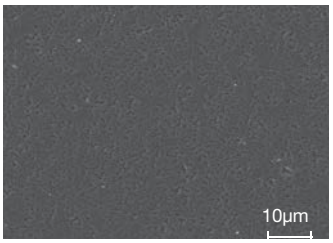
■ General Features

AURORA Coat X, which has ultra-enhanced smoothness through our proprietary new coating technology, low coefficient of friction and high-hardness thin DLC (Diamond Like Carbon) layer, improves wear and adhesion resistance, to realise long and stable tool life in drilling of aluminum alloys and non-ferrous metals.

■ Features

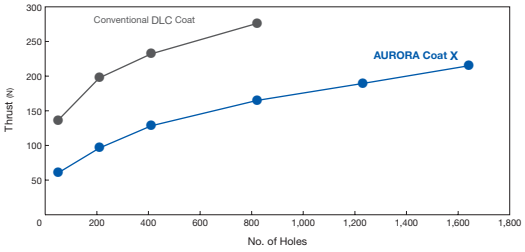
- Thin, ultra-smooth DLC coating
  Significantly improved adhesion resistance in drilling of aluminum alloy and non-ferrous metals
  Significantly reduced cutting force, contributing to stable long tool life

● Coating Surface Properties



(SEM image)

● Cutting Force



Work Material: ADC12 Machine: Vertical Machining Centre BT30 Tool: MDA0600S06H05 (ø6mm × 5D)
Cutting Conditions: vc = 180m/min f = 0.2mm/rev Internal Coolant Supply (Water-soluble)

AURORA Coat DL1300 DL1500

■ General Features

High-hardness, low-friction coefficient AURORA Coat has excellent adhesion resistance in drilling of aluminum alloy and non-ferrous metals, and works in combination with special cutting edge shapes to achieve stable tool life.

■ Features

- Thin, smooth DLC coating with a low coefficient of friction
  Suppresses adhesion to the cutting edge and reduces cutting force during drilling of aluminum alloy and non-ferrous metals
- High adhesion strength withstands violent cutting conditions
  The world's first coating applicable to cutting tools, with our proprietary coating technique improving adhesion strength

■ AURORA Coat Application Examples

AURORA Coat Super MULTIDRILL NHGS series (after drilling 100 holes)	 Clean cutting edge with no adhesion
Competitor's Product B (after drilling 20 holes)	 Severe adhesion

Tool : MDW 0800NHGS5
Work Material : ADC12
Cutting Conditions : vc = 200m/min, f = 1.0mm/rev, H = 32mm, Internal Coolant Supply

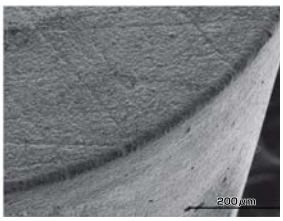
SUMIDIA Coat

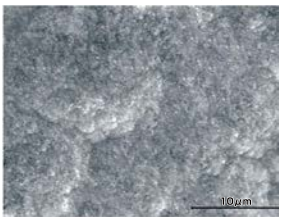
■ General Features

Our original polycrystalline diamond coating technology achieves over 10 times the wear resistance of uncoated carbide.
Excellent diamond layer adhesion is achieved with a combination of a dedicated substrate for diamond coating and a proprietary coating pre-treatment technique.

■ Features

- Creating a fine-grained diamond coating that provides the combination of high strength and high wear resistance on smooth surfaces that is required for CFRP drilling





■ SUMIDIA Coat Application Examples

SUMIDIA Coat	Competitor's Diamond Coating
No. of Workpieces: 600 holes Able to continue 	No. of Workpieces: 50 holes Coating peels and burrs are formed

Tool : SUMIDIA Coat Drill ø6.35mm
Work Material : CFRP
Cutting Conditions : vc = 130m/min, f = 0.075mm/rev, H = 15mm, through hole Dry

NeXEO MDE series

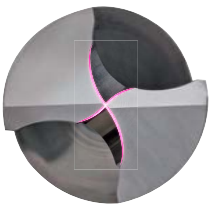
■ General Features

- Innovative new general purpose drill. Utilising the ACT100 grade.
- Applicable to a wide range of materials from high carbon steel and die steel to stainless steel. Enables stable drilling even on small machining centres and small lathes.
- NX Coat made with ABSOTECH™ technology for excellent wear resistance and thermal resistance.
- Low resistance chip breaking.

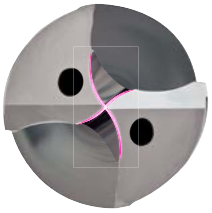
■ Features and Applications

- RX THINNING reduces thrust. Also ideal for small machining centres and small lathes.
- Further reduces cutting force with overlap thinning, suppressing wear in hub drilling. Excellent for shallow holes.
  *L/D=2 sizes only

RX THINNING + Arc Shaped Cutting Lip

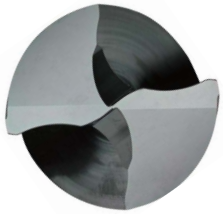


External Coolant Supply

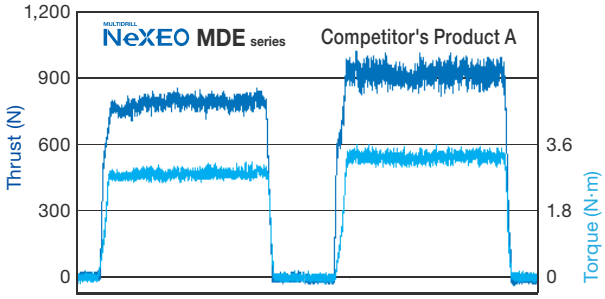


Internal Coolant Supply

Overlap Thinning



For Hub Drilling

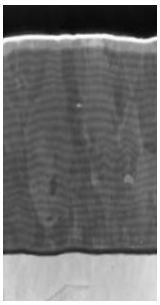


Work Material : S50C
Diameter : ø8mm
Hole Depth : 5D
Cutting Conditions : vc = 80m/min, f = 0.15mm/rev, H = 38mm (through), Internal Coolant Supply (water soluble)

- General-purpose drill suitable for a wide range of work materials and cutting conditions

General-purpose grade

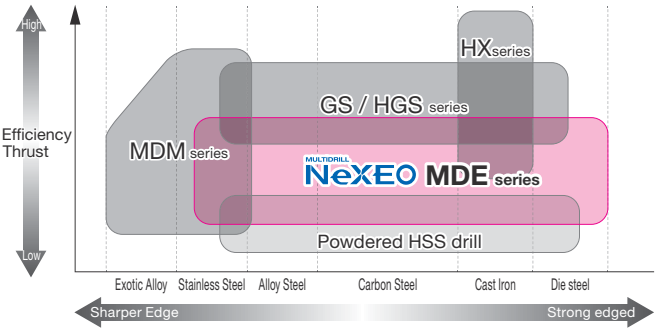
ACT100



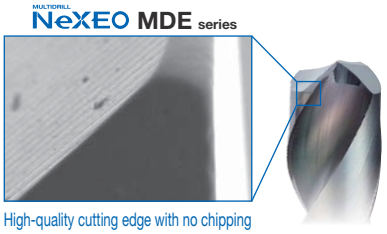
Super multi-layered TiAlCrSi coating
Hardness (HV): 46GPa
Oxidisation Starting Temperature: 1,100°C

Highly Adhesive Layer

- **Micro-grained carbide substrate**
  Achieves both wear and fracture resistance
- **NX Coat**
  ABSOTECH™ technology for high quality, high hardness, high strength and excellent wear resistance and thermal resistance.

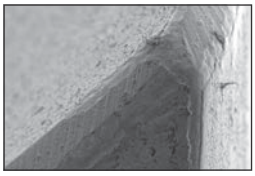


- **High-quality edge provides stable tool life**



High-quality cutting edge with no chipping

Competitor's Product B



Chipping in edge coating

- Strong arc-shaped cutting edge design for good chip evacuation

NeXEO MDE series

Chips are broken into small pieces

Competitor's Product C

Elongated chips

Work Material : S50C
Diameter : ø9mm
Hole Depth : 5D
Cutting Conditions : vc = 80m/min, f = 0.15mm/rev, Internal Coolant Supply (water soluble)

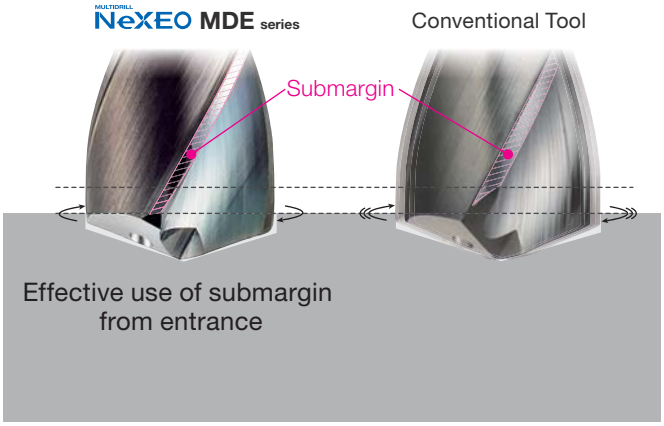
NeXEO MDE series

● Drills holes with good precision and high quality

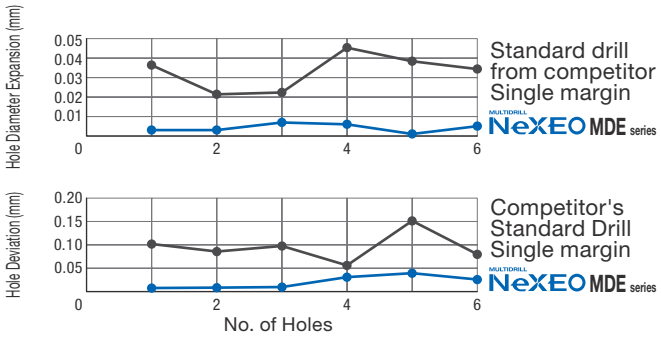
Internal Coolant Supply: Double margin

External Coolant Supply: Single margin

● Special double margin for good hole precision (internal coolant supply)

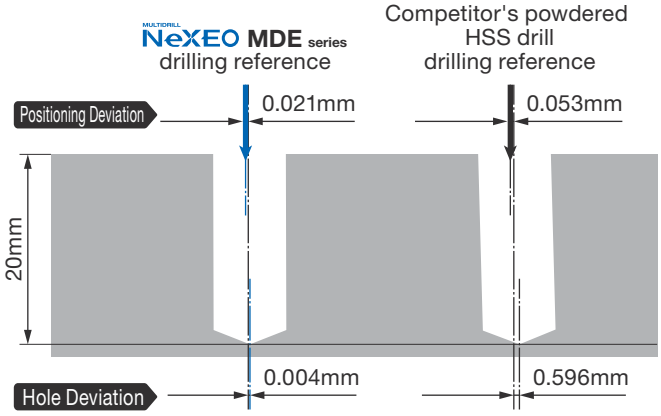


● Comparison of hole precision (die steel drilling)



Work Material : DH31S (49HRC)
Tool : MDE 0800S08H05 (ø8mmx5D)
Cutting Conditions : vc = 17m/min, f = 0.07mm/rev, Internal Coolant Supply (water soluble)

● Compared to powdered HSS drill, good hole precision (die steel drilling)



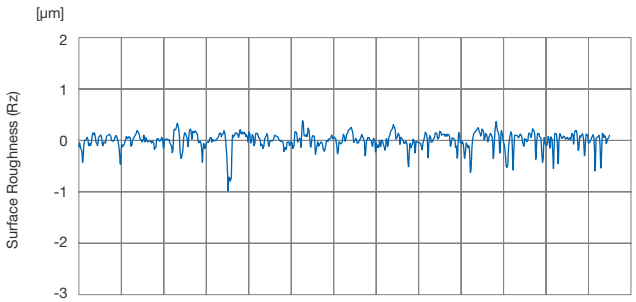
Good hole position accuracy
Minimal hole deviation

Work Material : NAK55
Tool : MDE 0680S07E04 (ø6.8mmx4D)
Cutting Conditions : vc = 50m/min, f = 0.1mm/rev, H = 20mm, External Coolant Supply (water soluble)

● Comparison of hole wall

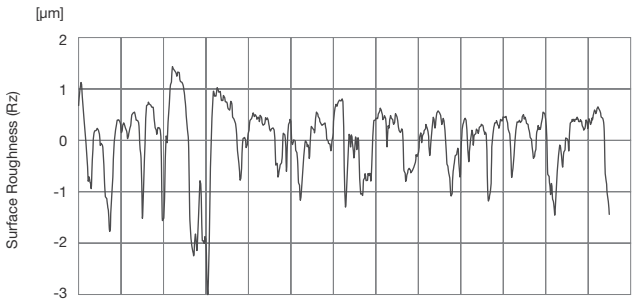
NeXEO MDE series

Shiny and good



Competitor's powdered HSS drill

Cloudiness due to blemishes

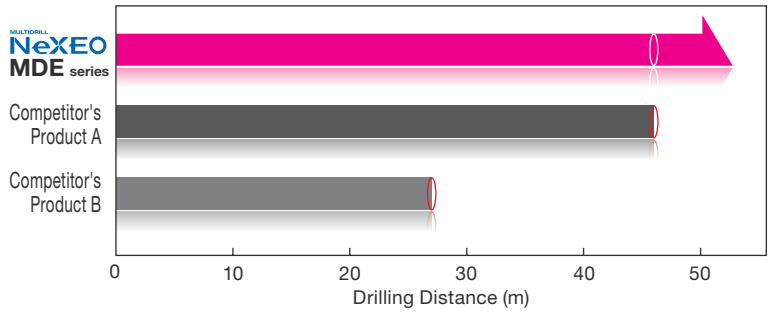


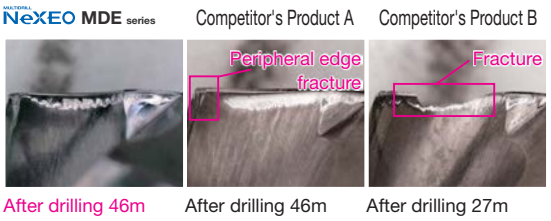
NeXEO MDE series

■ Application Examples

High Carbon Steel

ACT100 grade achieves high wear resistance and peripheral edge fracture resistance





After drilling 46m | After drilling 46m | After drilling 27m

Work Material: S50C, Machine: BT30 Vertical Machining Centre, Tool: MDE 0800S08H05 (ø8mmx5D)
Cutting Conditions: vc = 80m/min, f = 0.15mm/rev, H = 38mm (through), Internal Coolant Supply (water soluble)

Low Carbon Steel

Good chip control in low carbon steel drilling

NeXEO MDE series

Chips are broken into small pieces

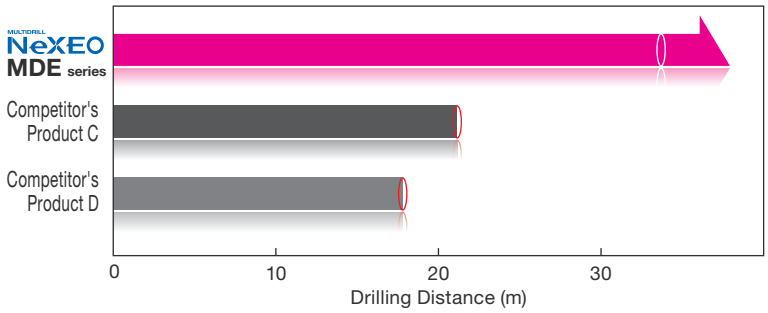
Conventional Tool A

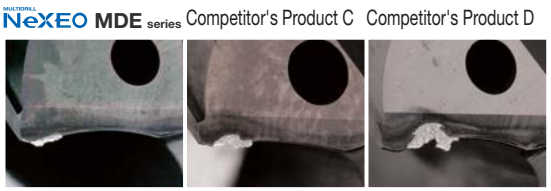
Elongated chips

Work Material: SM material (machine tool frame), Machine: Large double column machining centre, Tool: MDE 1150S12H05 (ø11.5mmx5D)
Cutting Conditions: vc = 100m/min, f = 0.25mm/rev, Internal Coolant Supply (water soluble), Drilling Distance: approx. 20m per 30 min

Ultra-hard Alloy Steel

ACT100 grade and new edge design prevent workpiece adhesion fracture





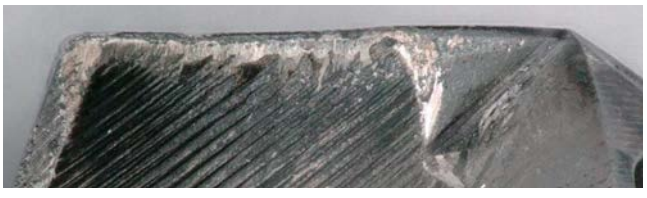
After drilling 34m
Minimal adhesion | After drilling 21m | After drilling 18m

Work Material: SCM440H (30HRC), Machine: BT30 vertical machining centre, Tool: MDE 0800S08H05 (ø8mmx5D)
Cutting Conditions: vc = 80m/min, f = 0.15mm/rev, H = 40mm (through), Internal Coolant Supply (water soluble)

Stainless Steel

Stable drilling of stainless steel on a lathe

NeXEO MDE series



Conventional Tool B

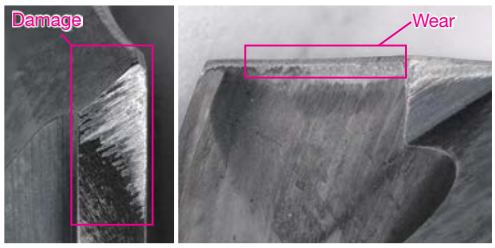
Work Material: SUS310, Machine: NC lathe (workpiece rotates), Tool: MDE 0350S04H05 (ø3.5mmx5D)
Cutting Conditions: vc = 40m/min, f = 0.05mm/rev, H = 14mm, Internal Coolant Supply (non-water-soluble), No. of Workpieces: 5,000

Ductile Cast Iron

NX Coat reduces margin damage and rake face wear

NeXEO MDE series

Competitor's Product E



Work Material: FCD450, Machine: HSK63 machining centre, Tool: MDE 079S08H05 (ø7.9mmx5D), with hole
Cutting Conditions: vc = 70m/min, f = 0.1mm/rev, H = 40mm (through), Internal Coolant Supply (water soluble) Drilling Distance: 64m

Frequency of Replacement Compared to Powdered HSS Drill

Long tool life approx. 10 times longer than powdered HSS drill

NeXEO MDE series No. of Workpieces: 12,000 holes

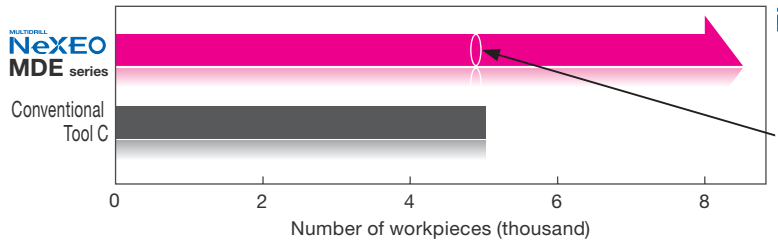
Competitor's Product F: Powdered HSS drill No. of Workpieces: 1,200 holes

Work Material: S15C (automotive parts), Machine: BT30 small machining centre
Tool: MDE 0680S07E04 (ø6.8mm x 4D)
Cutting Conditions: vc = 60m/min, f = 0.15mm/rev External Coolant Supply (non-water-soluble)

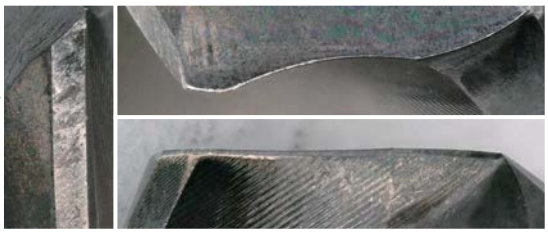
Tool: Competitor's Product F Powdered HSS drill (ø6.8mm x 4D)
Cutting Conditions: vc = 40m/min, f = 0.15mm/rev External Coolant Supply (non-water-soluble)

Stainless Steel, Small Lathe

Low resistance, good chip control and long, stable tool life



NeXEO MDE series

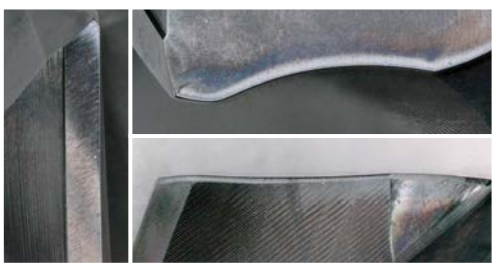


Work Material: SUS316L (95 to 100HRB) (plugs), Machine: Automatic CNC lathe (workpiece rotates), Tool: MDE 0680S07E2 (ø6.8mmx2D)
Cutting Conditions: vc = 50m/min, f = 0.09mm/rev, External Coolant Supply (non-water-soluble)

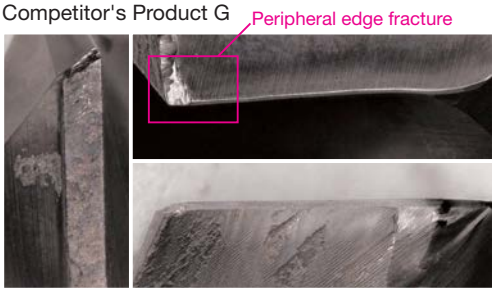
High Carbon Steel, Small Machining Centre

Achieves long, stable tool life even with low feed machining of high carbon steel

NeXEO MDE series



Competitor's Product G



Work Material: S48C, Machine: BT30 small machining centre, Tool: MDE 0830S07E4 (ø8.3mmx4D)
Cutting Conditions: vc = 30m/min, f = 0.08mm/rev, External Coolant Supply (non-water soluble), No. of Workpieces: 150

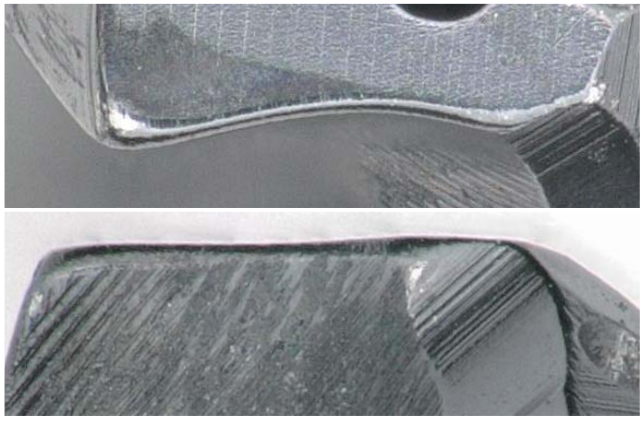
NeXEO MDE series

● Series expansion of small diameter drills from ø1.0mm to 2.9mm

■ Application Examples

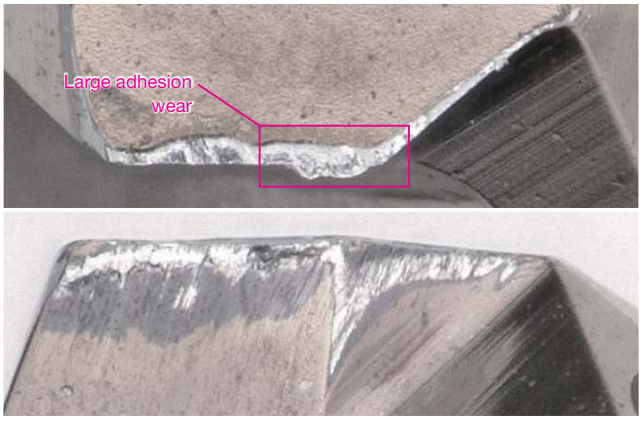
Low Carbon Steel

NeXEO MDE series



After drilling 900 holes

Competitor's Product H

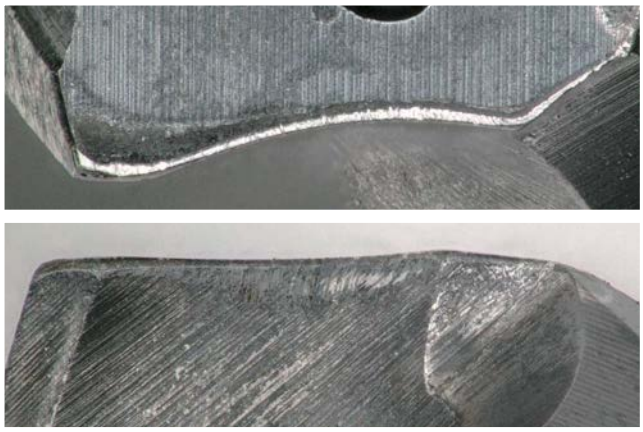


After drilling 900 holes

Work Material: SCM415, Machine: BT30 vertical machining centre, Tool: MDE 0100S03H05 (ø1.0mmx5D), with hole
Cutting Conditions: vc = 40m/min, f = 0.04mm/rev, H = 5mm (through), Internal Coolant Supply (water soluble)

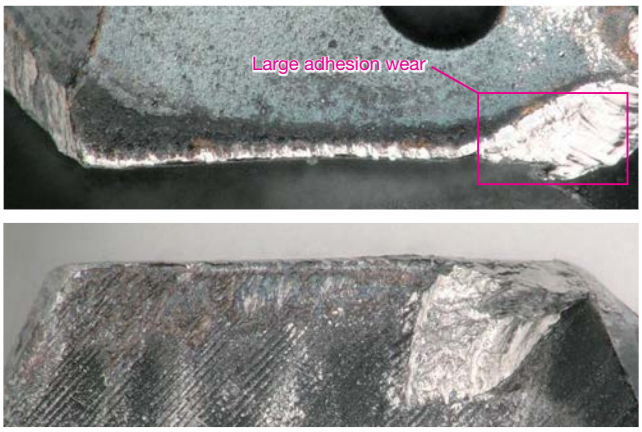
Stainless Steel

NeXEO MDE series



After drilling 3,840 holes

Conventional Tool D



After drilling 3,840 holes

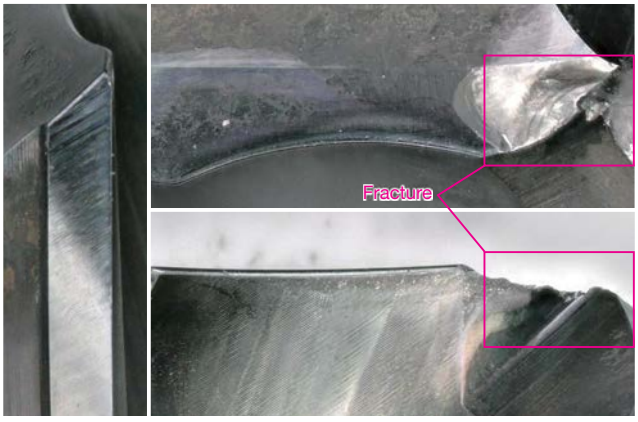
Work Material: SUS304, Machine: BT30 vertical machining centre, Tool: MDE 0200S03H05 (ø2.0mmx5D), with hole
Cutting Conditions: vc = 40m/min, f = 0.04mm/rev, H = 10mm (through), Internal Coolant Supply (water soluble)

Hole for Press-fitting Bolt in Inner Shaft of Hub

NeXEO MDE series

After drilling 2,500 workpieces (5 holes per workpiece)

Conventional Tool E



After drilling 1,000 workpieces (5 holes per workpiece)

Work Material: S55C equivalent, Machine: Vertical machining centre, Tool: MDE 1397S14E02H (ø13.97mmx2D)
Cutting Conditions: vc = 75m/min, f = 0.2mm/rev, H = 15mm (through), External Coolant Supply (water soluble)

NeXEO MDE-E type (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

NX Coat 2D 4D

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (single margin)

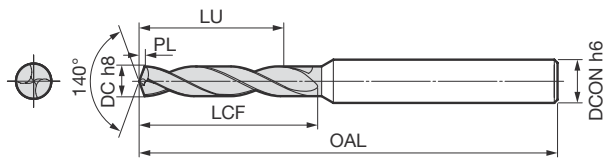
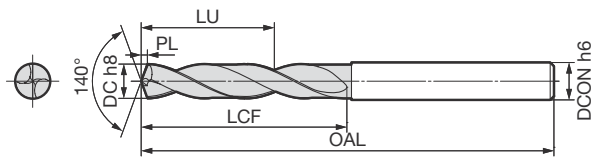


Fig 2 (single margin)



Diameter ø1.0 to 3.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	2	●	MDE 0100S03E02	5.7	7.2	45.2	0.2	3.0	1
	4	●	0100S03E04	7.7	9.2	49.2	0.2	3.0	1
1.1	2	●	MDE 0110S03E02	5.6	7.2	45.2	0.2	3.0	1
	4	●	0110S03E04	7.6	9.2	49.2	0.2	3.0	1
1.2	2	●	MDE 0120S03E02	6.4	8.2	45.2	0.2	3.0	1
	4	●	0120S03E04	8.4	10.2	49.2	0.2	3.0	1
1.3	2	●	MDE 0130S03E02	6.3	8.2	45.2	0.2	3.0	1
	4	●	0130S03E04	9.3	11.2	49.2	0.2	3.0	1
1.4	2	●	MDE 0140S03E02	7.2	9.3	45.3	0.3	3.0	1
	4	●	0140S03E04	9.2	11.3	49.3	0.3	3.0	1
1.5	2	●	MDE 0150S03E02	7.1	9.3	45.3	0.3	3.0	1
	4	●	0150S03E04	10.1	12.3	49.3	0.3	3.0	1
1.6	2	●	MDE 0160S03E02	7.9	10.3	45.3	0.3	3.0	1
	4	●	0160S03E04	10.9	13.3	49.3	0.3	3.0	1
1.7	2	●	MDE 0170S03E02	7.8	10.3	45.3	0.3	3.0	1
	4	●	0170S03E04	10.8	13.3	49.3	0.3	3.0	1
1.8	2	●	MDE 0180S03E02	8.6	11.3	45.3	0.3	3.0	1
	4	●	0180S03E04	11.6	14.3	49.3	0.3	3.0	1
1.9	2	●	MDE 0190S03E02	8.5	11.3	45.3	0.3	3.0	1
	4	●	0190S03E04	12.5	15.3	49.3	0.3	3.0	1
2.0	2	●	MDE 0200S03E02	9.4	12.4	45.4	0.4	3.0	1
	4	●	0200S03E04	13.4	16.4	49.4	0.4	3.0	1
2.1	2	●	MDE 0210S03E02	9.3	12.4	45.4	0.4	3.0	1
	4	●	0210S03E04	13.3	16.4	49.4	0.4	3.0	1
2.2	2	●	MDE 0220S03E02	10.1	13.4	45.4	0.4	3.0	1
	4	●	0220S03E04	14.1	17.4	49.4	0.4	3.0	1
2.3	2	●	MDE 0230S03E02	10.0	13.4	45.4	0.4	3.0	1
	4	●	0230S03E04	14.0	17.4	49.4	0.4	3.0	1
2.4	2	●	MDE 0240S03E02	10.8	14.4	45.4	0.4	3.0	2
	4	●	0240S03E04	14.8	18.4	49.4	0.4	3.0	2
2.5	2	●	MDE 0250S03E02	10.8	14.5	45.5	0.5	3.0	2
	4	●	0250S03E04	14.8	18.5	49.5	0.5	3.0	2
2.6	2	●	MDE 0260S03E02	11.6	15.5	45.5	0.5	3.0	2
	4	●	0260S03E04	15.6	19.5	49.5	0.5	3.0	2
2.7	2	●	MDE 0270S03E02	11.5	15.5	45.5	0.5	3.0	2
	4	●	0270S03E04	15.5	19.5	49.5	0.5	3.0	2
2.76	2	●	MDE 0276S03E02	11.3	15.5	45.5	0.5	3.0	2
2.78	2	●	0278S03E02	11.3	15.5	45.5	0.5	3.0	2
2.8	2	●	MDE 0280S03E02	11.3	15.5	45.5	0.5	3.0	2
	4	●	0280S03E04	15.3	19.5	49.5	0.5	3.0	2
2.9	2	●	MDE 0290S03E02	11.2	15.5	45.5	0.5	3.0	2
	4	●	0290S03E04	15.2	19.5	49.5	0.5	3.0	2
3.0	2	●	MDE 0300S03E02	9.0	13.5	45.5	0.5	3.0	2
	4	●	0300S03E04	15.0	19.5	49.5	0.5	3.0	2

Grade: ACT100

Diameter ø3.1 to 5.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.1	2	●	MDE 0310S04E02	15.0	19.6	54.6	0.6	4.0	2
	4	●	0310S04E04	20.0	24.6	60.6	0.6	4.0	2
3.2	2	●	MDE 0320S04E02	14.8	19.6	54.6	0.6	4.0	2
	4	●	0320S04E04	19.8	24.6	60.6	0.6	4.0	2
3.3	2	●	MDE 0330S04E02	14.7	19.6	54.6	0.6	4.0	2
	4	●	0330S04E04	19.7	24.6	60.6	0.6	4.0	2
3.4	2	●	MDE 0340S04E02	14.5	19.6	54.6	0.6	4.0	2
	4	●	0340S04E04	19.5	24.6	60.6	0.6	4.0	2
3.5	2	●	MDE 0350S04E02	14.4	19.6	54.6	0.6	4.0	2
	4	●	0350S04E04	19.4	24.6	60.6	0.6	4.0	2
3.6	2	●	MDE 0360S04E02	16.3	21.7	54.7	0.7	4.0	2
	4	●	0360S04E04	22.3	27.7	60.7	0.7	4.0	2
3.66	2	●	MDE 0366S04E02	16.2	21.7	54.7	0.7	4.0	2
3.68	2	●	0368S04E02	16.2	21.7	54.7	0.7	4.0	2
3.7	2	●	MDE 0370S04E02	16.2	21.7	54.7	0.7	4.0	2
	4	●	0370S04E04	22.2	27.7	60.7	0.7	4.0	2
3.8	2	●	MDE 0380S04E02	16.0	21.7	54.7	0.7	4.0	2
	4	●	0380S04E04	22.0	27.7	60.7	0.7	4.0	2
3.9	2	●	MDE 0390S04E02	15.9	21.7	54.7	0.7	4.0	2
	4	●	0390S04E04	21.9	27.7	60.7	0.7	4.0	2
4.0	2	●	MDE 0400S04E02	15.7	21.7	54.7	0.7	4.0	2
	4	●	0400S04E04	21.7	27.7	60.7	0.7	4.0	2
4.1	2	●	MDE 0410S05E02	17.6	23.7	61.7	0.7	5.0	2
	4	●	0410S05E04	25.6	31.7	76.7	0.7	5.0	2
4.2	2	●	MDE 0420S05E02	17.5	23.8	61.8	0.8	5.0	2
	4	●	0420S05E04	25.5	31.8	76.8	0.8	5.0	2
4.3	2	●	MDE 0430S05E02	17.4	23.8	61.8	0.8	5.0	2
	4	●	0430S05E04	25.4	31.8	76.8	0.8	5.0	2
4.4	2	●	MDE 0440S05E02	17.2	23.8	61.8	0.8	5.0	2
	4	●	0440S05E04	25.2	31.8	76.8	0.8	5.0	2
4.5	2	●	MDE 0450S05E02	17.1	23.8	61.8	0.8	5.0	2
	4	●	0450S05E04	25.1	31.8	76.8	0.8	5.0	2
4.6	2	●	MDE 0460S05E02	18.9	25.8	61.8	0.8	5.0	2
	4	●	0460S05E04	31.9	38.8	76.8	0.8	5.0	2
4.62	2	●	MDE 0462S05E02	18.9	25.8	61.8	0.8	5.0	2
4.64	2	●	0464S05E02	18.9	25.8	61.8	0.8	5.0	2
4.7	2	●	MDE 0470S05E02	18.9	25.9	61.9	0.9	5.0	2
	4	●	0470S05E04	31.9	38.9	76.9	0.9	5.0	2
4.8	2	●	MDE 0480S05E02	18.7	25.9	61.9	0.9	5.0	2
	4	●	0480S05E04	31.7	38.9	76.9	0.9	5.0	2
4.9	2	●	MDE 0490S05E02	18.6	25.9	61.9	0.9	5.0	2
	4	●	0490S05E04	31.6	38.9	76.9	0.9	5.0	2
5.0	2	●	MDE 0500S05E02	18.4	25.9	61.9	0.9	5.0	2
	4	●	0500S05E04	31.4	38.9	76.9	0.9	5.0	2

Grade: ACT100

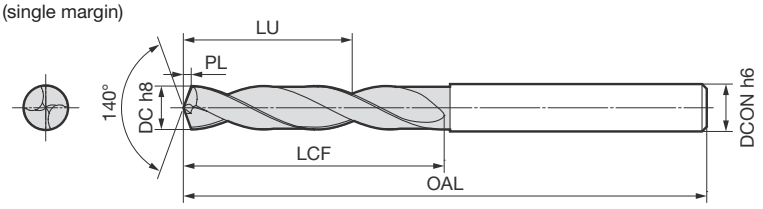
NeXEO MDE-E type (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

NX Coat | 2D | 4D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (single margin)



Diameter ø5.1 to 7.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.1	2	●	MDE 0510S06E02	18.3	25.9	65.9	0.9	6.0	2
	4	●	0510S06E04	32.3	39.9	81.9	0.9	6.0	2
5.2	2	●	MDE 0520S06E02	18.1	25.9	65.9	0.9	6.0	2
	4	●	0520S06E04	32.1	39.9	81.9	0.9	6.0	2
5.3	2	●	MDE 0530S06E02	18.1	26.0	66.0	1.0	6.0	2
	4	●	0530S06E04	32.1	40.0	82.0	1.0	6.0	2
5.4	2	●	MDE 0540S06E02	17.9	26.0	66.0	1.0	6.0	2
	4	●	0540S06E04	31.9	40.0	82.0	1.0	6.0	2
5.5	2	●	MDE 0550S06E02	17.8	26.0	66.0	1.0	6.0	2
	4	●	0550S06E04	31.8	40.0	82.0	1.0	6.0	2
5.52	2	●	MDE 0552S06E02	19.6	28.0	66.0	1.0	6.0	2
5.54	2	●	0554S06E02	19.6	28.0	66.0	1.0	6.0	2
5.6	2	●	MDE 0560S06E02	19.6	28.0	66.0	1.0	6.0	2
	4	●	0560S06E04	33.6	42.0	82.0	1.0	6.0	2
5.7	2	●	MDE 0570S06E02	19.5	28.0	66.0	1.0	6.0	2
	4	●	0570S06E04	33.5	42.0	82.0	1.0	6.0	2
5.8	2	●	MDE 0580S06E02	19.4	28.1	66.1	1.1	6.0	2
	4	●	0580S06E04	33.4	42.1	82.1	1.1	6.0	2
5.9	2	●	MDE 0590S06E02	19.3	28.1	66.1	1.1	6.0	2
	4	●	0590S06E04	33.3	42.1	82.1	1.1	6.0	2
6.0	2	●	MDE 0600S06E02	19.1	28.1	66.1	1.1	6.0	2
	4	●	0600S06E04	33.1	42.1	82.1	1.1	6.0	2
6.1	2	●	MDE 0610S07E02	23.0	32.1	74.1	1.1	7.0	2
	4	●	0610S07E04	34.0	43.1	84.1	1.1	7.0	2
6.2	2	●	MDE 0620S07E02	22.8	32.1	74.1	1.1	7.0	2
	4	●	0620S07E04	33.8	43.1	84.1	1.1	7.0	2
6.3	2	●	MDE 0630S07E02	22.7	32.1	74.1	1.1	7.0	2
	4	●	0630S07E04	33.7	43.1	84.1	1.1	7.0	2
6.4	2	●	MDE 0640S07E02	22.6	32.2	74.2	1.2	7.0	2
	4	●	0640S07E04	33.6	43.2	84.2	1.2	7.0	2
6.5	2	●	MDE 0650S07E02	22.5	32.2	74.2	1.2	7.0	2
	4	●	0650S07E04	33.5	43.2	84.2	1.2	7.0	2
6.6	2	●	MDE 0660S07E02	24.3	34.2	74.2	1.2	7.0	2
	4	●	0660S07E04	34.3	44.2	84.2	1.2	7.0	2
6.7	2	●	MDE 0670S07E02	24.2	34.2	74.2	1.2	7.0	2
	4	●	0670S07E04	34.2	44.2	84.2	1.2	7.0	2
6.8	2	●	MDE 0680S07E02	24.0	34.2	74.2	1.2	7.0	2
	4	●	0680S07E04	34.0	44.2	84.2	1.2	7.0	2
6.9	2	●	MDE 0690S07E02	24.0	34.3	74.3	1.3	7.0	2
	4	●	0690S07E04	34.0	44.3	84.3	1.3	7.0	2
7.0	2	●	MDE 0700S07E02	23.8	34.3	74.3	1.3	7.0	2
	4	●	0700S07E04	33.8	44.3	84.3	1.3	7.0	2
7.1	2	●	MDE 0710S08E02	23.7	34.3	79.3	1.3	8.0	2
	4	●	0710S08E04	35.7	46.3	91.3	1.3	8.0	2

Grade: ACT100

Diameter ø7.2 to 9.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.2	2	●	MDE 0720S08E02	23.5	34.3	79.3	1.3	8.0	2
	4	●	0720S08E04	35.5	46.3	91.3	1.3	8.0	2
7.3	2	●	MDE 0730S08E02	23.4	34.3	79.3	1.3	8.0	2
	4	●	0730S08E04	35.4	46.3	91.3	1.3	8.0	2
7.36	2	●	MDE 0736S08E02	23.2	34.3	79.3	1.3	8.0	2
7.38	2	●	0738S08E02	23.2	34.3	79.3	1.3	8.0	2
7.4	2	●	MDE 0740S08E02	23.2	34.3	79.3	1.3	8.0	2
	4	●	0740S08E04	35.2	46.3	91.3	1.3	8.0	2
7.5	2	●	MDE 0750S08E02	23.2	34.4	79.4	1.4	8.0	2
	4	●	0750S08E04	35.2	46.4	91.4	1.4	8.0	2
7.52	2	●	MDE 0752S08E02	26.0	37.4	79.4	1.4	8.0	2
7.54	2	●	0754S08E02	26.0	37.4	79.4	1.4	8.0	2
7.6	2	●	MDE 0760S08E02	26.0	37.4	79.4	1.4	8.0	2
	4	●	0760S08E04	38.0	49.4	91.4	1.4	8.0	2
7.7	2	●	MDE 0770S08E02	25.9	37.4	79.4	1.4	8.0	2
	4	●	0770S08E04	37.9	49.4	91.4	1.4	8.0	2
7.8	2	●	MDE 0780S08E02	25.7	37.4	79.4	1.4	8.0	2
	4	●	0780S08E04	37.7	49.4	91.4	1.4	8.0	2
7.9	2	●	MDE 0790S08E02	25.6	37.4	79.4	1.4	8.0	2
	4	●	0790S08E04	37.6	49.4	91.4	1.4	8.0	2
8.0	2	●	MDE 0800S08E02	25.5	37.5	79.5	1.5	8.0	2
	4	●	0800S08E04	37.5	49.5	91.5	1.5	8.0	2
8.1	2	●	MDE 0810S09E02	25.4	37.5	83.5	1.5	9.0	2
	4	●	0810S09E04	42.4	54.5	99.5	1.5	9.0	2
8.2	2	●	MDE 0820S09E02	25.2	37.5	83.5	1.5	9.0	2
	4	●	0820S09E04	42.2	54.5	99.5	1.5	9.0	2
8.3	2	●	MDE 0830S09E02	25.1	37.5	83.5	1.5	9.0	2
	4	●	0830S09E04	42.1	54.5	99.5	1.5	9.0	2
8.4	2	●	MDE 0840S09E02	24.9	37.5	83.5	1.5	9.0	2
	4	●	0840S09E04	41.9	54.5	99.5	1.5	9.0	2
8.5	2	●	MDE 0850S09E02	24.8	37.5	83.5	1.5	9.0	2
	4	●	0850S09E04	41.8	54.5	99.5	1.5	9.0	2
8.6	2	●	MDE 0860S09E02	26.7	39.6	83.6	1.6	9.0	2
	4	●	0860S09E04	43.7	56.6	99.6	1.6	9.0	2
8.7	2	●	MDE 0870S09E02	26.6	39.6	83.6	1.6	9.0	2
	4	●	0870S09E04	43.6	56.6	99.6	1.6	9.0	2
8.8	2	●	MDE 0880S09E02	26.4	39.6	83.6	1.6	9.0	2
	4	●	0880S09E04	43.4	56.6	99.6	1.6	9.0	2
8.9	2	●	MDE 0890S09E02	26.3	39.6	83.6	1.6	9.0	2
	4	●	0890S09E04	43.3	56.6	99.6	1.6	9.0	2
9.0	2	●	MDE 0900S09E02	26.1	39.6	83.6	1.6	9.0	2
	4	●	0900S09E04	43.1	56.6	99.6	1.6	9.0	2
9.1	2	●	MDE 0910S10E02	26.1	39.7	88.7	1.7	10.0	2
	4	●	0910S10E04	46.1	59.7	106.7	1.7	10.0	2

Grade: ACT100

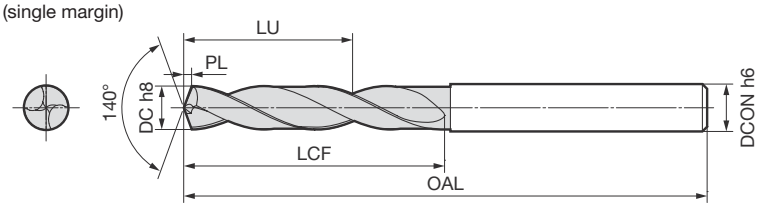
NeXEO MDE-E type (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

NX Coat | 2D | 4D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (single margin)



Diameter ø9.2 to 11.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.2	2	●	MDE 0920S10E02	25.9	39.7	88.7	1.7	10.0	2
	4	●	0920S10E04	45.9	59.7	106.7	1.7	10.0	2
9.24	2	●	MDE 0924S10E02	25.8	39.7	88.7	1.7	10.0	2
9.26	2	●	0926S10E02	25.8	39.7	88.7	1.7	10.0	2
9.3	2	●	MDE 0930S10E02	25.8	39.7	88.7	1.7	10.0	2
	4	●	0930S10E04	45.8	59.7	106.7	1.7	10.0	2
9.36	2	●	MDE 0936S10E02	25.6	39.7	88.7	1.7	10.0	2
9.38	2	●	0938S10E02	25.6	39.7	88.7	1.7	10.0	2
9.4	2	●	MDE 0940S10E02	25.6	39.7	88.7	1.7	10.0	2
	4	●	0940S10E04	45.6	59.7	106.7	1.7	10.0	2
9.5	2	●	MDE 0950S10E02	25.5	39.7	88.7	1.7	10.0	2
	4	●	0950S10E04	45.5	59.7	106.7	1.7	10.0	2
9.52	2	●	MDE 0952S10E02	28.3	42.7	88.7	1.7	10.0	2
9.54	2	●	0954S10E02	28.3	42.7	88.7	1.7	10.0	2
9.6	2	●	MDE 0960S10E02	28.3	42.7	88.7	1.7	10.0	2
	4	●	0960S10E04	47.3	61.7	106.7	1.7	10.0	2
9.7	2	●	MDE 0970S10E02	28.3	42.8	88.8	1.8	10.0	2
	4	●	0970S10E04	47.3	61.8	106.8	1.8	10.0	2
9.8	2	●	MDE 0980S10E02	28.1	42.8	88.8	1.8	10.0	2
	4	●	0980S10E04	47.1	61.8	106.8	1.8	10.0	2
9.9	2	●	MDE 0990S10E02	28.0	42.8	88.8	1.8	10.0	2
	4	●	0990S10E04	47.0	61.8	106.8	1.8	10.0	2
10.0	2	●	MDE 1000S10E02	27.8	42.8	88.8	1.8	10.0	2
	4	●	1000S10E04	46.8	61.8	106.8	1.8	10.0	2
10.1	2	●	MDE 1010S11E02	27.7	42.8	94.8	1.8	11.0	2
	4	●	1010S11E04	52.7	67.8	115.8	1.8	11.0	2
10.2	2	●	MDE 1020S11E02	27.6	42.9	94.9	1.9	11.0	2
	4	●	1020S11E04	52.6	67.9	115.9	1.9	11.0	2
10.3	2	●	MDE 1030S11E02	27.5	42.9	94.9	1.9	11.0	2
	4	●	1030S11E04	52.5	67.9	115.9	1.9	11.0	2
10.4	2	●	MDE 1040S11E02	27.3	42.9	94.9	1.9	11.0	2
	4	●	1040S11E04	52.3	67.9	115.9	1.9	11.0	2
10.5	2	●	MDE 1050S11E02	27.2	42.9	94.9	1.9	11.0	2
	4	●	1050S11E04	52.2	67.9	115.9	1.9	11.0	2
10.6	2	●	MDE 1060S11E02	31.0	46.9	94.9	1.9	11.0	2
	4	●	1060S11E04	54.0	69.9	115.9	1.9	11.0	2
10.7	2	●	MDE 1070S11E02	30.9	46.9	94.9	1.9	11.0	2
	4	●	1070S11E04	53.9	69.9	115.9	1.9	11.0	2
10.8	2	●	MDE 1080S11E02	30.8	47.0	95.0	2.0	11.0	2
	4	●	1080S11E04	53.8	70.0	116.0	2.0	11.0	2
10.9	2	●	MDE 1090S11E02	30.7	47.0	95.0	2.0	11.0	2
	4	●	1090S11E04	53.7	70.0	116.0	2.0	11.0	2
11.0	2	●	MDE 1100S11E02	30.5	47.0	95.0	2.0	11.0	2
	4	●	1100S11E04	53.5	70.0	116.0	2.0	11.0	2

Grade: ACT100

Diameter ø11.1 to 13.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
11.1	2	●	MDE 1110S12E02	30.4	47.0	102.0	2.0	12.0	2
	4	●	1110S12E04	56.4	73.0	123.0	2.0	12.0	2
11.2	2	●	MDE 1120S12E02	30.2	47.0	102.0	2.0	12.0	2
	4	●	1120S12E04	56.2	73.0	123.0	2.0	12.0	2
11.22	2	●	MDE 1122S12E02	30.2	47.0	102.0	2.0	12.0	2
11.24	2	●	1124S12E02	30.2	47.0	102.0	2.0	12.0	2
11.3	2	●	MDE 1130S12E02	30.2	47.1	102.1	2.1	12.0	2
	4	●	1130S12E04	56.2	73.1	123.1	2.1	12.0	2
11.36	2	●	MDE 1136S12E02	30.0	47.1	102.1	2.1	12.0	2
11.38	2	●	1138S12E02	30.0	47.1	102.1	2.1	12.0	2
11.4	2	●	MDE 1140S12E02	30.0	47.1	102.1	2.1	12.0	2
	4	●	1140S12E04	56.0	73.1	123.1	2.1	12.0	2
11.5	2	●	MDE 1150S12E02	29.9	47.1	102.1	2.1	12.0	2
	4	●	1150S12E04	55.9	73.1	123.1	2.1	12.0	2
11.6	2	●	MDE 1160S12E02	31.7	49.1	102.1	2.1	12.0	2
	4	●	1160S12E04	57.7	75.1	123.1	2.1	12.0	2
11.7	2	●	MDE 1170S12E02	31.6	49.1	102.1	2.1	12.0	2
	4	●	1170S12E04	57.6	75.1	123.1	2.1	12.0	2
11.8	2	●	MDE 1180S12E02	31.4	49.1	102.1	2.1	12.0	2
	4	●	1180S12E04	57.4	75.1	123.1	2.1	12.0	2
11.9	2	●	MDE 1190S12E02	31.4	49.2	102.2	2.2	12.0	2
	4	●	1190S12E04	57.4	75.2	123.2	2.2	12.0	2
12.0	2	●	MDE 1200S12E02	31.2	49.2	102.2	2.2	12.0	2
	4	●	1200S12E04	57.2	75.2	123.2	2.2	12.0	2
12.1	2	●	MDE 1210S13E02	31.1	49.2	102.2	2.2	13.0	2
	4	●	1210S13E04	60.1	78.2	139.2	2.2	13.0	2
12.2	2	●	MDE 1220S13E02	30.9	49.2	102.2	2.2	13.0	2
	4	●	1220S13E04	59.9	78.2	139.2	2.2	13.0	2
12.3	2	●	MDE 1230S13E02	30.8	49.2	102.2	2.2	13.0	2
	4	●	1230S13E04	59.8	78.2	139.2	2.2	13.0	2
12.4	2	●	MDE 1240S13E02	30.7	49.3	102.3	2.3	13.0	2
	4	●	1240S13E04	59.7	78.3	139.3	2.3	13.0	2
12.5	2	●	MDE 1250S13E02	30.6	49.3	102.3	2.3	13.0	2
	4	●	1250S13E04	59.6	78.3	139.3	2.3	13.0	2
12.6	2	●	MDE 1260S13E02	32.4	51.3	102.3	2.3	13.0	2
	4	●	1260S13E04	61.4	80.3	139.3	2.3	13.0	2
12.7	2	●	MDE 1270S13E02	32.3	51.3	102.3	2.3	13.0	2
	4	●	1270S13E04	61.3	80.3	139.3	2.3	13.0	2
12.8	2	●	MDE 1280S13E02	32.1	51.3	102.3	2.3	13.0	2
	4	●	1280S13E04	61.1	80.3	139.3	2.3	13.0	2
12.9	2	●	MDE 1290S13E02	32.0	51.3	102.3	2.3	13.0	2
	4	●	1290S13E04	61.0	80.3	139.3	2.3	13.0	2
13.0	2	●	MDE 1300S13E02	31.9	51.4	102.4	2.4	13.0	2
	4	●	1300S13E04	60.9	80.4	139.4	2.4	13.0	2

Grade: ACT100

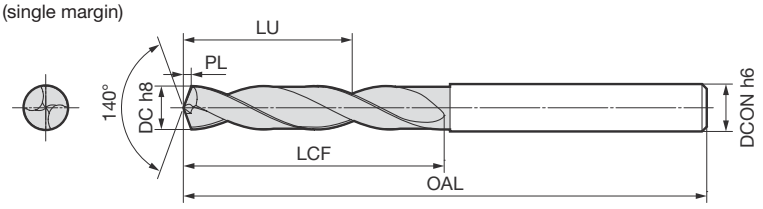
NeXEO MDE-E type (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

NX Coat | 2D | 4D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (single margin)



Diameter ø13.1 to 15.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
13.1	2	●	MDE 1310S14E02	32.8	52.4	107.4	2.4	14.0	2
	4	●	1310S14E04	66.8	86.4	149.4	2.4	14.0	2
13.2	2	●	MDE 1320S14E02	32.6	52.4	107.4	2.4	14.0	2
	4	●	1320S14E04	66.6	86.4	149.4	2.4	14.0	2
13.3	2	●	MDE 1330S14E02	32.5	52.4	107.4	2.4	14.0	2
	4	●	1330S14E04	66.5	86.4	149.4	2.4	14.0	2
13.4	2	●	MDE 1340S14E02	32.3	52.4	107.4	2.4	14.0	2
	4	●	1340S14E04	66.3	86.4	149.4	2.4	14.0	2
13.5	2	●	MDE 1350S14E02	32.3	52.5	107.5	2.5	14.0	2
	4	●	1350S14E04	66.3	86.5	149.5	2.5	14.0	2
13.6	2	●	MDE 1360S14E02	34.1	54.5	107.5	2.5	14.0	2
	4	●	1360S14E04	68.1	88.5	149.5	2.5	14.0	2
13.7	2	●	MDE 1370S14E02	34.0	54.5	107.5	2.5	14.0	2
	4	●	1370S14E04	68.0	88.5	149.5	2.5	14.0	2
13.8	2	●	MDE 1380S14E02	33.8	54.5	107.5	2.5	14.0	2
	4	●	1380S14E04	67.8	88.5	149.5	2.5	14.0	2
13.9	2	●	MDE 1390S14E02	33.7	54.5	107.5	2.5	14.0	2
	4	●	1390S14E04	67.7	88.5	149.5	2.5	14.0	2
14.0	2	●	MDE 1400S14E02	33.5	54.5	107.5	2.5	14.0	2
	4	●	1400S14E04	67.5	88.5	149.5	2.5	14.0	2
14.1	2	●	MDE 1410S15E02	33.5	54.6	110.6	2.6	15.0	2
	4	●	1410S15E04	70.5	91.6	155.6	2.6	15.0	2
14.2	2	●	MDE 1420S15E02	33.3	54.6	110.6	2.6	15.0	2
	4	●	1420S15E04	70.3	91.6	155.6	2.6	15.0	2
14.3	2	●	MDE 1430S15E02	33.2	54.6	110.6	2.6	15.0	2
	4	●	1430S15E04	70.2	91.6	155.6	2.6	15.0	2
14.4	2	●	MDE 1440S15E02	33.0	54.6	110.6	2.6	15.0	2
	4	●	1440S15E04	70.0	91.6	155.6	2.6	15.0	2
14.5	2	●	MDE 1450S15E02	32.9	54.6	110.6	2.6	15.0	2
	4	●	1450S15E04	69.9	91.6	155.6	2.6	15.0	2
14.6	2	●	MDE 1460S15E02	33.8	55.7	110.7	2.7	15.0	2
	4	●	1460S15E04	71.8	93.7	155.7	2.7	15.0	2
14.7	2	●	MDE 1470S15E02	33.7	55.7	110.7	2.7	15.0	2
	4	●	1470S15E04	71.7	93.7	155.7	2.7	15.0	2
14.8	2	●	MDE 1480S15E02	33.5	55.7	110.7	2.7	15.0	2
	4	●	1480S15E04	71.5	93.7	155.7	2.7	15.0	2
14.9	2	●	MDE 1490S15E02	33.4	55.7	110.7	2.7	15.0	2
	4	●	1490S15E04	71.4	93.7	155.7	2.7	15.0	2
15.0	2	●	MDE 1500S15E02	33.2	55.7	110.7	2.7	15.0	2
	4	●	1500S15E04	71.2	93.7	155.7	2.7	15.0	2
15.1	2	●	MDE 1510S16E02	33.1	55.7	114.7	2.7	16.0	2
	4	●	1510S16E04	74.1	96.7	162.7	2.7	16.0	2
15.2	2	●	MDE 1520S16E02	33.0	55.8	114.8	2.8	16.0	2
	4	●	1520S16E04	74.0	96.8	162.8	2.8	16.0	2

Grade: ACT100

Diameter ø15.3 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.3	2	●	MDE 1530S16E02	32.9	55.8	114.8	2.8	16.0	2
	4	●	1530S16E04	73.9	96.8	162.8	2.8	16.0	2
15.4	2	●	MDE 1540S16E02	32.7	55.8	114.8	2.8	16.0	2
	4	●	1540S16E04	73.7	96.8	162.8	2.8	16.0	2
15.5	2	●	MDE 1550S16E02	32.6	55.8	114.8	2.8	16.0	2
	4	●	1550S16E04	73.6	96.8	162.8	2.8	16.0	2
15.6	2	●	MDE 1560S16E02	34.4	57.8	114.8	2.8	16.0	2
	4	●	1560S16E04	75.4	98.8	162.8	2.8	16.0	2
15.7	2	●	MDE 1570S16E02	34.4	57.9	114.9	2.9	16.0	2
	4	●	1570S16E04	75.4	98.9	162.9	2.9	16.0	2
15.8	2	●	MDE 1580S16E02	34.2	57.9	114.9	2.9	16.0	2
	4	●	1580S16E04	75.2	98.9	162.9	2.9	16.0	2
15.9	2	●	MDE 1590S16E02	34.1	57.9	114.9	2.9	16.0	2
	4	●	1590S16E04	75.1	98.9	162.9	2.9	16.0	2
16.0	2	●	MDE 1600S16E02	33.9	57.9	114.9	2.9	16.0	2
	4	●	1600S16E04	74.9	98.9	162.9	2.9	16.0	2
16.5	2	●	MDE 1650S17E02	34.3	59.0	119.0	3.0	17.0	2
	4	●	1650S17E04	76.3	101.0	170.0	3.0	17.0	2
16.8	4	●	MDE 1680S17E04	75.9	101.1	170.1	3.1	17.0	2
17.0	2	●	MDE 1700S17E02	34.6	60.1	119.1	3.1	17.0	2
	4	●	1700S17E04	75.7	101.2	170.2	3.2	17.0	2
17.5	2	●	MDE 1750S18E02	35.0	61.2	123.2	3.2	18.0	2
	4	●	1750S18E04	77.0	103.2	170.2	3.2	18.0	2
18.0	2	●	MDE 1800S18E02	35.3	62.3	123.3	3.3	18.0	2
	4	●	1800S18E04	78.3	105.3	170.3	3.3	18.0	2
18.5	2	●	MDE 1850S19E02	34.7	62.4	126.4	3.4	19.0	2
	4	●	1850S19E04	79.7	107.4	182.4	3.4	19.0	2
19.0	2	●	MDE 1900S19E02	35.0	63.5	126.5	3.5	19.0	2
	4	●	1900S19E04	80.9	109.4	182.4	3.4	19.0	2
19.5	2	●	MDE 1950S20E02	35.3	64.5	130.5	3.5	20.0	2
	4	●	1950S20E04	84.3	113.5	182.5	3.5	20.0	2
19.7	4	●	MDE 1970S20E04	88.1	117.6	182.6	3.6	20.0	2
20.0	2	●	MDE 2000S20E02	35.6	65.6	130.6	3.6	20.0	2
	4	●	2000S20E04	87.6	117.6	182.6	3.6	20.0	2

Grade: ACT100

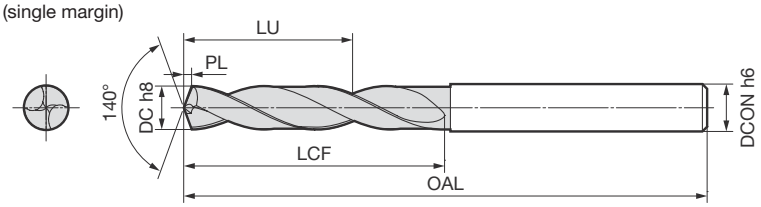
NeXEO MDE-E type for Hub Drilling (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

NX Coat 2D

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (single margin)



Diameter ø8.8 to 13.97mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.80	2	●	**MDE 0880S09E02H**	26.4	39.6	83.6	1.6	9.0	1
10.00	2	●	**1000S10E02H**	27.8	42.8	88.8	1.8	10.0	1
10.80	2	●	**1080S11E02H**	30.8	47.0	95.0	2.0	11.0	1
12.04	2	●	**1204S13E02H**	31.1	49.2	102.2	2.2	13.0	1
12.52	2	●	**1252S13E02H**	32.4	51.3	102.3	2.3	13.0	1
13.85	2	●	**1385S14E02H**	33.7	54.5	107.5	2.5	14.0	1
13.92	2	●	**1392S14E02H**	33.5	54.5	107.5	2.5	14.0	1
13.97	2	●	**1397S14E02H**	33.5	54.5	107.5	2.5	14.0	1

Grade: ACT100

NeXEO MDE-E type (External Coolant Supply)

Recommended Cutting Conditions (MDE-E type, External Coolant Supply, 2D/4D) *Including hub drilling

1. The recommended cutting conditions below are for cases where a water soluble coolant is used (excluding drilling of stainless steel).
2. Supply sufficient water soluble coolant to the cutting edge.
3. If using non-water-soluble coolant, reduce the cutting speed by 20-30% and ensure that sufficient coolant is supplied.
4. When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
5. Make sure the flute does not enter the collet.
6. If the surface of the workpiece is abnormally shaped (tilted, interrupted etc.), reduce the feed rate to about half when feeding the drill in the workpiece.
   * If stable drilling is still not possible, pre-drilling of a flat surface with a Flat MULTIDRILL MDF series drill is recommended.
7. When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.

Work Material		Mild Steel/Low Carbon Steel SS400/S15C up to 160HB		Carbon Steel S35C/S50C up to 230HB		Alloy Steel SCM/SCr 20 to 30HRC		Alloy Steel SCM/SCr 30 to 38HRC	
Cutting Speed	Dia. < ø3	30 to 80m/min		30 to 80m/min		30 to 80m/min		30 to 80m/min	
	Dia. ≥ ø3	60 to 100m/min		60 to 120m/min		50 to 100m/min		40 to 80m/min	
Diameter DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06
ø2.0		9,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08
ø2.5		9,500	0.04 to 0.08	9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.04 to 0.08
ø3.0		8,500	0.05 to 0.12	8,500	0.05 to 0.12	7,500	0.05 to 0.12	6,400	0.05 to 0.12
ø4.0		6,400	0.07 to 0.17	6,400	0.07 to 0.17	5,600	0.07 to 0.17	4,800	0.07 to 0.17
ø5.0		5,100	0.08 to 0.20	5,100	0.08 to 0.20	4,500	0.08 to 0.20	3,900	0.08 to 0.20
ø6.0		4,300	0.10 to 0.20	4,300	0.10 to 0.20	3,800	0.10 to 0.20	3,200	0.10 to 0.20
ø7.0		3,700	0.12 to 0.23	3,700	0.12 to 0.23	3,200	0.12 to 0.23	2,800	0.12 to 0.23
ø8.0		3,200	0.15 to 0.25	3,200	0.15 to 0.25	2,800	0.15 to 0.25	2,400	0.15 to 0.25
ø9.0		2,900	0.17 to 0.25	2,900	0.17 to 0.25	2,500	0.17 to 0.25	2,200	0.17 to 0.25
ø10.0		2,600	0.18 to 0.28	2,600	0.18 to 0.28	2,300	0.18 to 0.28	2,000	0.18 to 0.28
ø11.0		2,400	0.20 to 0.30	2,400	0.20 to 0.30	2,100	0.20 to 0.30	1,800	0.20 to 0.30
ø12.0		2,200	0.20 to 0.30	2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30
ø14.0		1,900	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30
ø16.0		1,600	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.20 to 0.30
ø18.0		1,500	0.20 to 0.30	1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.20 to 0.30
ø20.0		1,300	0.20 to 0.30	1,300	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.20 to 0.30
High-efficiency Product		GS series		GS series		GS series		GS series	

Work Material		Cast Iron FC250 to 280HB		Ductile Cast Iron FCD450/FCD600 to 270HB		Stainless Steel (oil-based drilling) SUS304/SUS410 to 200HB		Special Steel/Pre-hardened Steel SKS2/SKD61 (non-tempered) 30 to 38HRC	
Cutting Speed	Dia. < ø3	30 to 80m/min		30 to 80m/min		20 to 50m/min		30 to 60m/min	
	Dia. ≥ ø3	60 to 100m/min		50 to 100m/min		20 to 50m/min		30 to 60m/min	
Diameter DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.02 to 0.05	8,500	0.02 to 0.04
ø2.0		8,000	0.04 to 0.08	8,000	0.04 to 0.08	6,300	0.03 to 0.06	7,100	0.03 to 0.06
ø2.5		9,000	0.04 to 0.08	8,500	0.04 to 0.08	5,100	0.03 to 0.07	5,700	0.03 to 0.06
ø3.0		8,500	0.06 to 0.15	7,500	0.05 to 0.12	4,300	0.05 to 0.10	5,400	0.05 to 0.12
ø4.0		6,400	0.08 to 0.18	5,600	0.07 to 0.17	3,200	0.05 to 0.10	4,000	0.07 to 0.17
ø5.0		5,100	0.10 to 0.20	4,500	0.08 to 0.20	2,600	0.06 to 0.15	3,200	0.08 to 0.20
ø6.0		4,300	0.12 to 0.23	3,800	0.10 to 0.20	2,200	0.06 to 0.15	2,700	0.10 to 0.20
ø7.0		3,700	0.12 to 0.23	3,200	0.12 to 0.23	1,900	0.06 to 0.18	2,300	0.10 to 0.20
ø8.0		3,200	0.18 to 0.25	2,800	0.15 to 0.25	1,600	0.06 to 0.20	2,000	0.12 to 0.25
ø9.0		2,900	0.17 to 0.25	2,500	0.17 to 0.25	1,500	0.08 to 0.20	1,800	0.12 to 0.25
ø10.0		2,600	0.18 to 0.28	2,300	0.18 to 0.28	1,300	0.08 to 0.20	1,600	0.12 to 0.25
ø11.0		2,400	0.20 to 0.30	2,100	0.20 to 0.30	1,200	0.08 to 0.20	1,500	0.15 to 0.30
ø12.0		2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,100	0.10 to 0.25	1,400	0.15 to 0.30
ø14.0		1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,000	0.10 to 0.25	1,200	0.15 to 0.30
ø16.0		1,600	0.20 to 0.30	1,400	0.20 to 0.30	800	0.10 to 0.25	1,000	0.15 to 0.30
ø18.0		1,500	0.20 to 0.30	1,300	0.20 to 0.30	800	0.10 to 0.25	900	0.15 to 0.30
ø20.0		1,300	0.20 to 0.30	1,200	0.20 to 0.30	700	0.10 to 0.25	800	0.15 to 0.30
High-efficiency Product		GS series		GS series		GS series		GS series	

NeXEO MDE-H type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy | Copper Alloy

NX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (Double margin)

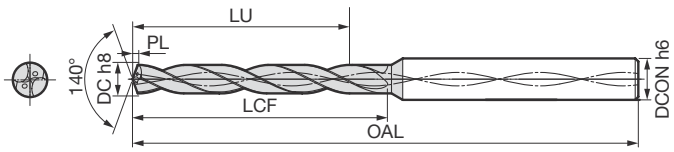
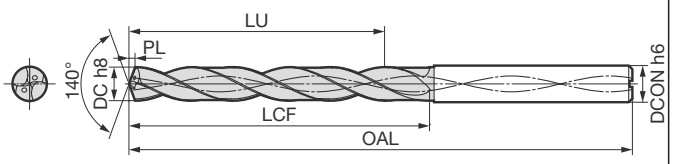


Fig 2 (Double margin)



Diameter ø1.0 to 2.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	3	●	MDE 0100S03H03	6.7	8.2	57.2	0.2	3.0	1
	5	●	0100S03H05	8.7	10.2	59.2	0.2	3.0	1
	8	●	0100S03H08	11.7	13.2	62.2	0.2	3.0	1
1.1	3	●	MDE 0110S03H03	6.6	8.2	57.2	0.2	3.0	1
	5	●	0110S03H05	8.6	10.2	59.2	0.2	3.0	1
	8	●	0110S03H08	12.6	14.2	62.2	0.2	3.0	1
1.2	3	●	MDE 0120S03H03	7.4	9.2	57.2	0.2	3.0	1
	5	●	0120S03H05	9.4	11.2	59.2	0.2	3.0	1
	8	●	0120S03H08	13.4	15.2	62.2	0.2	3.0	1
1.3	3	●	MDE 0130S03H03	7.3	9.2	57.2	0.2	3.0	1
	5	●	0130S03H05	10.3	12.2	59.2	0.2	3.0	1
	8	●	0130S03H08	14.3	16.2	62.2	0.2	3.0	1
1.4	3	●	MDE 0140S03H03	8.2	10.3	57.3	0.3	3.0	1
	5	●	0140S03H05	11.2	13.3	59.3	0.3	3.0	1
	8	●	0140S03H08	15.2	17.3	62.3	0.3	3.0	1
1.5	3	●	MDE 0150S03H03	9.1	11.3	57.3	0.3	3.0	1
	5	●	0150S03H05	12.1	14.3	59.3	0.3	3.0	1
	8	●	0150S03H08	16.1	18.3	62.3	0.3	3.0	1
1.6	3	●	MDE 0160S03H03	8.9	11.3	59.3	0.3	3.0	1
	5	●	0160S03H05	11.9	14.3	62.3	0.3	3.0	1
	8	●	0160S03H08	16.9	19.3	67.3	0.3	3.0	1
1.7	3	●	MDE 0170S03H03	9.8	12.3	59.3	0.3	3.0	1
	5	●	0170S03H05	12.8	15.3	62.3	0.3	3.0	1
	8	●	0170S03H08	17.8	20.3	67.3	0.3	3.0	1
1.8	3	●	MDE 0180S03H03	9.6	12.3	59.3	0.3	3.0	1
	5	●	0180S03H05	13.6	16.3	62.3	0.3	3.0	1
	8	●	0180S03H08	18.6	21.3	67.3	0.3	3.0	1
1.9	3	●	MDE 0190S03H03	10.5	13.3	59.3	0.3	3.0	1
	5	●	0190S03H05	14.5	17.3	62.3	0.3	3.0	1
	8	●	0190S03H08	19.5	22.3	70.3	0.3	3.0	1
2.0	3	●	MDE 0200S03H03	11.4	14.4	59.4	0.4	3.0	1
	5	●	0200S03H05	15.4	18.4	62.4	0.4	3.0	1
	8	●	0200S03H08	21.4	24.4	70.4	0.4	3.0	1
2.1	3	●	MDE 0210S03H03	11.3	14.4	59.4	0.4	3.0	1
	5	●	0210S03H05	15.3	18.4	62.4	0.4	3.0	1
	8	●	0210S03H08	22.3	25.4	70.4	0.4	3.0	1
2.2	3	●	MDE 0220S03H03	12.1	15.4	59.4	0.4	3.0	1
	5	●	0220S03H05	16.1	19.4	62.4	0.4	3.0	1
	8	●	0220S03H08	23.1	26.4	70.4	0.4	3.0	1
2.3	3	●	MDE 0230S03H03	12.0	15.4	63.4	0.4	3.0	1
	5	●	0230S03H05	17.0	20.4	68.4	0.4	3.0	1
	8	●	0230S03H08	24.0	27.4	75.4	0.4	3.0	1
2.4	3	●	MDE 0240S03H03	12.8	16.4	63.4	0.4	3.0	2
	5	●	0240S03H05	17.8	21.4	68.4	0.4	3.0	2
	8	●	0240S03H08	24.8	28.4	75.4	0.4	3.0	2

Grade: ACT100

Diameter ø2.5 to 3.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.5	3	●	MDE 0250S03H03	13.8	17.5	63.5	0.5	3.0	2
	5	●	0250S03H05	18.8	22.5	68.5	0.5	3.0	2
	8	●	0250S03H08	25.8	29.5	75.5	0.5	3.0	2
2.6	3	●	MDE 0260S03H03	13.6	17.5	63.5	0.5	3.0	2
	5	●	0260S03H05	18.6	22.5	68.5	0.5	3.0	2
	8	●	0260S03H08	26.6	30.5	75.5	0.5	3.0	2
2.7	3	●	MDE 0270S03H03	14.5	18.5	68.5	0.5	3.0	2
	5	●	0270S03H05	19.5	23.5	78.5	0.5	3.0	2
	8	●	0270S03H08	27.5	31.5	81.5	0.5	3.0	2
2.76	5	●	MDE 0276S03H05	20.3	24.5	78.5	0.5	3.0	2
2.78	5	●	0278S03H05	20.3	24.5	78.5	0.5	3.0	2
2.8	3	●	MDE 0280S03H03	14.3	18.5	68.5	0.5	3.0	2
	5	●	0280S03H05	20.3	24.5	78.5	0.5	3.0	2
	8	●	0280S03H08	28.3	32.5	81.5	0.5	3.0	2
2.9	3	●	MDE 0290S03H03	15.2	19.5	68.5	0.5	3.0	2
	5	●	0290S03H05	21.2	25.5	78.5	0.5	3.0	2
	8	●	0290S03H08	29.2	33.5	81.5	0.5	3.0	2
3.0	3	●	MDE 0300S03H03	14.0	18.5	68.5	0.5	3.0	2
	5	●	0300S03H05	24.0	28.5	78.5	0.5	3.0	2
	8	●	0300S03H08	29.0	33.5	81.5	0.5	3.0	2
3.1	3	●	MDE 0310S04H03	16.0	20.6	72.6	0.6	4.0	2
	5	●	0310S04H05	28.0	32.6	86.6	0.6	4.0	2
	8	●	0310S04H08	34.5	39.1	92.6	0.6	4.0	2
3.2	3	●	MDE 0320S04H03	15.8	20.6	72.6	0.6	4.0	2
	5	●	0320S04H05	27.8	32.6	86.6	0.6	4.0	2
	8	●	0320S04H08	34.3	39.1	92.6	0.6	4.0	2
3.3	3	●	MDE 0330S04H03	15.7	20.6	72.6	0.6	4.0	2
	5	●	0330S04H05	27.7	32.6	86.6	0.6	4.0	2
	8	●	0330S04H08	34.2	39.1	92.6	0.6	4.0	2
3.4	3	●	MDE 0340S04H03	15.5	20.6	72.6	0.6	4.0	2
	5	●	0340S04H05	27.5	32.6	86.6	0.6	4.0	2
	8	●	0340S04H08	34.0	39.1	92.6	0.6	4.0	2
3.5	3	●	MDE 0350S04H03	15.4	20.6	72.6	0.6	4.0	2
	5	●	0350S04H05	27.4	32.6	86.6	0.6	4.0	2
	8	●	0350S04H08	33.9	39.1	92.6	0.6	4.0	2
3.6	3	●	MDE 0360S04H03	17.8	23.2	72.7	0.7	4.0	2
	5	●	0360S04H05	31.3	36.7	86.7	0.7	4.0	2
	8	●	0360S04H08	39.3	44.7	92.7	0.7	4.0	2
3.66	5	●	MDE 0366S04H05	31.2	36.7	86.7	0.7	4.0	2
3.68	5	●	0368S04H05	31.2	36.7	86.7	0.7	4.0	2
3.7	3	●	MDE 0370S04H03	17.7	23.2	72.7	0.7	4.0	2
	5	●	0370S04H05	31.2	36.7	86.7	0.7	4.0	2
	8	●	0370S04H08	39.2	44.7	92.7	0.7	4.0	2

Grade: ACT100

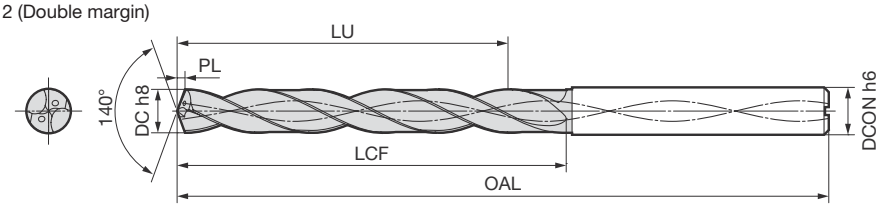
NeXEO MDE-H type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy | Copper Alloy

NX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (Double margin)



Diameter ø3.8 to 5.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.8	3	●	MDE 0380S04H03	17.5	23.2	72.7	0.7	4.0	2
	5	●	0380S04H05	31.0	36.7	86.7	0.7	4.0	2
	8	●	0380S04H08	39.0	44.7	92.7	0.7	4.0	2
3.9	3	●	MDE 0390S04H03	17.4	23.2	72.7	0.7	4.0	2
	5	●	0390S04H05	30.9	36.7	86.7	0.7	4.0	2
	8	●	0390S04H08	38.9	44.7	92.7	0.7	4.0	2
4.0	3	●	MDE 0400S04H03	17.2	23.2	72.7	0.7	4.0	2
	5	●	0400S04H05	30.7	36.7	86.7	0.7	4.0	2
	8	●	0400S04H08	38.7	44.7	92.7	0.7	4.0	2
4.1	3	●	MDE 0410S05H03	19.6	25.7	80.7	0.7	5.0	2
	5	●	0410S05H05	34.6	40.7	98.7	0.7	5.0	2
	8	●	0410S05H08	44.1	50.2	105.7	0.7	5.0	2
4.2	3	●	MDE 0420S05H03	19.5	25.8	80.8	0.8	5.0	2
	5	●	0420S05H05	34.5	40.8	98.8	0.8	5.0	2
	8	●	0420S05H08	44.0	50.3	105.8	0.8	5.0	2
4.3	3	●	MDE 0430S05H03	19.4	25.8	80.8	0.8	5.0	2
	5	●	0430S05H05	34.4	40.8	98.8	0.8	5.0	2
	8	●	0430S05H08	43.9	50.3	105.8	0.8	5.0	2
4.4	3	●	MDE 0440S05H03	19.2	25.8	80.8	0.8	5.0	2
	5	●	0440S05H05	34.2	40.8	98.8	0.8	5.0	2
	8	●	0440S05H08	43.7	50.3	105.8	0.8	5.0	2
4.5	3	●	MDE 0450S05H03	19.1	25.8	80.8	0.8	5.0	2
	5	●	0450S05H05	34.1	40.8	98.8	0.8	5.0	2
	8	●	0450S05H08	43.6	50.3	105.8	0.8	5.0	2
4.6	3	●	MDE 0460S05H03	21.4	28.3	80.8	0.8	5.0	2
	5	●	0460S05H05	37.9	44.8	98.8	0.8	5.0	2
	8	●	0460S05H08	48.9	55.8	105.8	0.8	5.0	2
4.62	5	●	MDE 0462S05H05	37.9	44.8	98.8	0.8	5.0	2
4.64	5	●	0464S05H05	37.9	44.8	98.8	0.8	5.0	2
4.7	3	●	MDE 0470S05H03	21.4	28.4	80.9	0.9	5.0	2
	5	●	0470S05H05	37.9	44.9	98.9	0.9	5.0	2
	8	●	0470S05H08	48.9	55.9	105.9	0.9	5.0	2
4.8	3	●	MDE 0480S05H03	21.2	28.4	80.9	0.9	5.0	2
	5	●	0480S05H05	37.7	44.9	98.9	0.9	5.0	2
	8	●	0480S05H08	48.7	55.9	105.9	0.9	5.0	2
4.9	3	●	MDE 0490S05H03	21.1	28.4	80.9	0.9	5.0	2
	5	●	0490S05H05	37.6	44.9	98.9	0.9	5.0	2
	8	●	0490S05H08	48.6	55.9	105.9	0.9	5.0	2
5.0	3	●	MDE 0500S05H03	20.9	28.4	80.9	0.9	5.0	2
	5	●	0500S05H05	37.4	44.9	98.9	0.9	5.0	2
	8	●	0500S05H08	48.4	55.9	105.9	0.9	5.0	2
5.1	3	●	MDE 0510S06H03	20.8	28.4	82.9	0.9	6.0	2
	5	●	0510S06H05	37.3	44.9	100.9	0.9	6.0	2
	8	●	0510S06H08	53.8	61.4	118.9	0.9	6.0	2

Grade: ACT100

Diameter ø5.2 to 6.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.2	3	●	MDE 0520S06H03	20.6	28.4	82.9	0.9	6.0	2
	5	●	0520S06H05	37.1	44.9	100.9	0.9	6.0	2
	8	●	0520S06H08	53.6	61.4	118.9	0.9	6.0	2
5.3	3	●	MDE 0530S06H03	20.6	28.5	83.0	1.0	6.0	2
	5	●	0530S06H05	37.1	45.0	101.0	1.0	6.0	2
	8	●	0530S06H08	53.6	61.5	119.0	1.0	6.0	2
5.4	3	●	MDE 0540S06H03	20.4	28.5	83.0	1.0	6.0	2
	5	●	0540S06H05	36.9	45.0	101.0	1.0	6.0	2
	8	●	0540S06H08	53.4	61.5	119.0	1.0	6.0	2
5.5	3	●	MDE 0550S06H03	20.3	28.5	83.0	1.0	6.0	2
	5	●	0550S06H05	36.8	45.0	101.0	1.0	6.0	2
	8	●	0550S06H08	53.3	61.5	119.0	1.0	6.0	2
5.52	5	●	MDE 0552S06H05	40.6	49.0	101.0	1.0	6.0	2
5.54	5	●	0554S06H05	40.6	49.0	101.0	1.0	6.0	2
5.6	3	●	MDE 0560S06H03	22.6	31.0	83.0	1.0	6.0	2
	5	●	0560S06H05	40.6	49.0	101.0	1.0	6.0	2
	8	●	0560S06H08	58.6	67.0	119.0	1.0	6.0	2
5.7	3	●	MDE 0570S06H03	22.5	31.0	83.0	1.0	6.0	2
	5	●	0570S06H05	40.5	49.0	101.0	1.0	6.0	2
	8	●	0570S06H08	58.5	67.0	119.0	1.0	6.0	2
5.8	3	●	MDE 0580S06H03	22.4	31.1	83.1	1.1	6.0	2
	5	●	0580S06H05	40.4	49.1	101.1	1.1	6.0	2
	8	●	0580S06H08	58.4	67.1	119.1	1.1	6.0	2
5.9	3	●	MDE 0590S06H03	22.3	31.1	83.1	1.1	6.0	2
	5	●	0590S06H05	40.3	49.1	101.1	1.1	6.0	2
	8	●	0590S06H08	58.3	67.1	119.1	1.1	6.0	2
6.0	3	●	MDE 0600S06H03	22.1	31.1	83.1	1.1	6.0	2
	5	●	0600S06H05	40.1	49.1	101.1	1.1	6.0	2
	8	●	0600S06H08	58.1	67.1	119.1	1.1	6.0	2
6.1	3	●	MDE 0610S07H03	24.5	33.6	89.1	1.1	7.0	2
	5	●	0610S07H05	44.0	53.1	110.1	1.1	7.0	2
	8	●	0610S07H08	63.5	72.6	131.1	1.1	7.0	2
6.2	3	●	MDE 0620S07H03	24.3	33.6	89.1	1.1	7.0	2
	5	●	0620S07H05	43.8	53.1	110.1	1.1	7.0	2
	8	●	0620S07H08	63.3	72.6	131.1	1.1	7.0	2
6.3	3	●	MDE 0630S07H03	24.2	33.6	89.1	1.1	7.0	2
	5	●	0630S07H05	43.7	53.1	110.1	1.1	7.0	2
	8	●	0630S07H08	63.2	72.6	131.1	1.1	7.0	2
6.4	3	●	MDE 0640S07H03	24.1	33.7	89.2	1.2	7.0	2
	5	●	0640S07H05	43.6	53.2	110.2	1.2	7.0	2
	8	●	0640S07H08	63.1	72.7	131.2	1.2	7.0	2
6.5	3	●	MDE 0650S07H03	24.0	33.7	89.2	1.2	7.0	2
	5	●	0650S07H05	43.5	53.2	110.2	1.2	7.0	2
	8	●	0650S07H08	63.0	72.7	131.2	1.2	7.0	2

Grade: ACT100

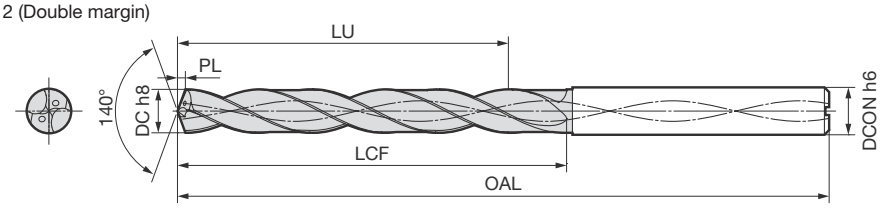
NeXEO MDE-H type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy | Copper Alloy

NX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (Double margin)



Diameter ø6.6 to 7.8mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.6	3	●	MDE 0660S07H03	26.3	36.2	89.2	1.2	7.0	2
	5	●	0660S07H05	47.3	57.2	110.2	1.2	7.0	2
	8	●	0660S07H08	68.3	78.2	131.2	1.2	7.0	2
6.7	3	●	MDE 0670S07H03	26.2	36.2	89.2	1.2	7.0	2
	5	●	0670S07H05	47.2	57.2	110.2	1.2	7.0	2
	8	●	0670S07H08	68.2	78.2	131.2	1.2	7.0	2
6.8	3	●	MDE 0680S07H03	26.0	36.2	89.2	1.2	7.0	2
	5	●	0680S07H05	47.0	57.2	110.2	1.2	7.0	2
	8	●	0680S07H08	68.0	78.2	131.2	1.2	7.0	2
6.9	3	●	MDE 0690S07H03	26.0	36.3	89.3	1.3	7.0	2
	5	●	0690S07H05	47.0	57.3	110.3	1.3	7.0	2
	8	●	0690S07H08	68.0	78.3	131.3	1.3	7.0	2
7.0	3	●	MDE 0700S07H03	25.8	36.3	89.3	1.3	7.0	2
	5	●	0700S07H05	46.8	57.3	110.3	1.3	7.0	2
	8	●	0700S07H08	67.8	78.3	131.3	1.3	7.0	2
7.1	3	●	MDE 0710S08H03	28.2	38.8	95.3	1.3	8.0	2
	5	●	0710S08H05	50.7	61.3	119.3	1.3	8.0	2
	8	●	0710S08H08	73.2	83.8	143.3	1.3	8.0	2
7.2	3	●	MDE 0720S08H03	28.0	38.8	95.3	1.3	8.0	2
	5	●	0720S08H05	50.5	61.3	119.3	1.3	8.0	2
	8	●	0720S08H08	73.0	83.8	143.3	1.3	8.0	2
7.3	3	●	MDE 0730S08H03	27.9	38.8	95.3	1.3	8.0	2
	5	●	0730S08H05	50.4	61.3	119.3	1.3	8.0	2
	8	●	0730S08H08	72.9	83.8	143.3	1.3	8.0	2
7.36	5	●	MDE 0736S08H05	50.2	61.3	119.3	1.3	8.0	2
7.38	5	●	0738S08H05	50.2	61.3	119.3	1.3	8.0	2
7.4	3	●	MDE 0740S08H03	27.7	38.8	95.3	1.3	8.0	2
	5	●	0740S08H05	50.2	61.3	119.3	1.3	8.0	2
	8	●	0740S08H08	72.7	83.8	143.3	1.3	8.0	2
7.5	3	●	MDE 0750S08H03	27.7	38.9	95.4	1.4	8.0	2
	5	●	0750S08H05	50.2	61.4	119.4	1.4	8.0	2
	8	●	0750S08H08	72.7	83.9	143.4	1.4	8.0	2
7.52	5	●	MDE 0752S08H05	54.0	65.4	119.4	1.4	8.0	2
7.54	5	●	0754S08H05	54.0	65.4	119.4	1.4	8.0	2
7.6	3	●	MDE 0760S08H03	30.0	41.4	95.4	1.4	8.0	2
	5	●	0760S08H05	54.0	65.4	119.4	1.4	8.0	2
	8	●	0760S08H08	78.0	89.4	143.4	1.4	8.0	2
7.7	3	●	MDE 0770S08H03	29.9	41.4	95.4	1.4	8.0	2
	5	●	0770S08H05	53.9	65.4	119.4	1.4	8.0	2
	8	●	0770S08H08	77.9	89.4	143.4	1.4	8.0	2
7.8	3	●	MDE 0780S08H03	29.7	41.4	95.4	1.4	8.0	2
	5	●	0780S08H05	53.7	65.4	119.4	1.4	8.0	2
	8	●	0780S08H08	77.7	89.4	143.4	1.4	8.0	2

Grade: ACT100

Diameter ø7.9 to 9.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.9	3	●	MDE 0790S08H03	29.6	41.4	95.4	1.4	8.0	2
	5	●	0790S08H05	53.6	65.4	119.4	1.4	8.0	2
	8	●	0790S08H08	77.6	89.4	143.4	1.4	8.0	2
8.0	3	●	MDE 0800S08H03	29.5	41.5	95.5	1.5	8.0	2
	5	●	0800S08H05	53.5	65.5	119.5	1.5	8.0	2
	8	●	0800S08H08	77.5	89.5	143.5	1.5	8.0	2
8.1	3	●	MDE 0810S09H03	31.9	44.0	101.5	1.5	9.0	2
	5	●	0810S09H05	57.4	69.5	128.5	1.5	9.0	2
	8	●	0810S09H08	82.9	95.0	155.5	1.5	9.0	2
8.2	3	●	MDE 0820S09H03	31.7	44.0	101.5	1.5	9.0	2
	5	●	0820S09H05	57.2	69.5	128.5	1.5	9.0	2
	8	●	0820S09H08	82.7	95.0	155.5	1.5	9.0	2
8.3	3	●	MDE 0830S09H03	31.6	44.0	101.5	1.5	9.0	2
	5	●	0830S09H05	57.1	69.5	128.5	1.5	9.0	2
	8	●	0830S09H08	82.6	95.0	155.5	1.5	9.0	2
8.4	3	●	MDE 0840S09H03	31.4	44.0	101.5	1.5	9.0	2
	5	●	0840S09H05	56.9	69.5	128.5	1.5	9.0	2
	8	●	0840S09H08	82.4	95.0	155.5	1.5	9.0	2
8.5	3	●	MDE 0850S09H03	31.3	44.0	101.5	1.5	9.0	2
	5	●	0850S09H05	56.8	69.5	128.5	1.5	9.0	2
	8	●	0850S09H08	82.3	95.0	155.5	1.5	9.0	2
8.6	3	●	MDE 0860S09H03	33.7	46.6	101.6	1.6	9.0	2
	5	●	0860S09H05	60.7	73.6	128.6	1.6	9.0	2
	8	●	0860S09H08	87.7	100.6	155.6	1.6	9.0	2
8.7	3	●	MDE 0870S09H03	33.6	46.6	101.6	1.6	9.0	2
	5	●	0870S09H05	60.6	73.6	128.6	1.6	9.0	2
	8	●	0870S09H08	87.6	100.6	155.6	1.6	9.0	2
8.8	3	●	MDE 0880S09H03	33.4	46.6	101.6	1.6	9.0	2
	5	●	0880S09H05	60.4	73.6	128.6	1.6	9.0	2
	8	●	0880S09H08	87.4	100.6	155.6	1.6	9.0	2
8.9	3	●	MDE 0890S09H03	33.3	46.6	101.6	1.6	9.0	2
	5	●	0890S09H05	60.3	73.6	128.6	1.6	9.0	2
	8	●	0890S09H08	87.3	100.6	155.6	1.6	9.0	2
9.0	3	●	MDE 0900S09H03	33.1	46.6	101.6	1.6	9.0	2
	5	●	0900S09H05	60.1	73.6	128.6	1.6	9.0	2
	8	●	0900S09H08	87.1	100.6	155.6	1.6	9.0	2
9.1	3	●	MDE 0910S10H03	35.6	49.2	107.7	1.7	10.0	2
	5	●	0910S10H05	64.1	77.7	137.7	1.7	10.0	2
	8	●	0910S10H08	92.6	106.2	167.7	1.7	10.0	2
9.2	3	●	MDE 0920S10H03	35.4	49.2	107.7	1.7	10.0	2
	5	●	0920S10H05	63.9	77.7	137.7	1.7	10.0	2
	8	●	0920S10H08	92.4	106.2	167.7	1.7	10.0	2

Grade: ACT100

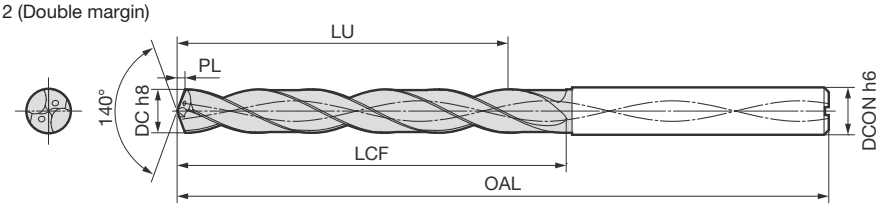
NeXEO MDE-H type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy | Copper Alloy

NX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (Double margin)



Diameter ø9.24 to 10.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.24	5	●	**MDE 0924S10H05**	63.8	77.7	137.7	1.7	10.0	2
9.26	5	●	**0926S10H05**	63.8	77.7	137.7	1.7	10.0	2
9.3	3	●	**MDE 0930S10H03**	35.3	49.2	107.7	1.7	10.0	2
	5	●	**0930S10H05**	63.8	77.7	137.7	1.7	10.0	2
	8	●	**0930S10H08**	92.3	106.2	167.7	1.7	10.0	2
9.36	5	●	**MDE 0936S10H05**	63.6	77.7	137.7	1.7	10.0	2
9.38	5	●	**0938S10H05**	63.6	77.7	137.7	1.7	10.0	2
9.4	3	●	**MDE 0940S10H03**	35.1	49.2	107.7	1.7	10.0	2
	5	●	**0940S10H05**	63.6	77.7	137.7	1.7	10.0	2
	8	●	**0940S10H08**	92.1	106.2	167.7	1.7	10.0	2
9.5	3	●	**MDE 0950S10H03**	35.0	49.2	107.7	1.7	10.0	2
	5	●	**0950S10H05**	63.5	77.7	137.7	1.7	10.0	2
	8	●	**0950S10H08**	92.0	106.2	167.7	1.7	10.0	2
9.52	5	●	**MDE 0952S10H05**	67.3	81.7	137.7	1.7	10.0	2
9.54	5	●	**0954S10H05**	67.3	81.7	137.7	1.7	10.0	2
9.6	3	●	**MDE 0960S10H03**	37.3	51.7	107.7	1.7	10.0	2
	5	●	**0960S10H05**	67.3	81.7	137.7	1.7	10.0	2
	8	●	**0960S10H08**	97.3	111.7	167.7	1.7	10.0	2
9.7	3	●	**MDE 0970S10H03**	37.3	51.8	107.8	1.8	10.0	2
	5	●	**0970S10H05**	67.3	81.8	137.8	1.8	10.0	2
	8	●	**0970S10H08**	97.3	111.8	167.8	1.8	10.0	2
9.8	3	●	**MDE 0980S10H03**	37.1	51.8	107.8	1.8	10.0	2
	5	●	**0980S10H05**	67.1	81.8	137.8	1.8	10.0	2
	8	●	**0980S10H08**	97.1	111.8	167.8	1.8	10.0	2
9.9	3	●	**MDE 0990S10H03**	37.0	51.8	107.8	1.8	10.0	2
	5	●	**0990S10H05**	67.0	81.8	137.8	1.8	10.0	2
	8	●	**0990S10H08**	97.0	111.8	167.8	1.8	10.0	2
10.0	3	●	**MDE 1000S10H03**	36.8	51.8	107.8	1.8	10.0	2
	5	●	**1000S10H05**	66.8	81.8	137.8	1.8	10.0	2
	8	●	**1000S10H08**	96.8	111.8	167.8	1.8	10.0	2
10.1	3	●	**MDE 1010S11H03**	39.2	54.3	117.8	1.8	11.0	2
	5	●	**1010S11H05**	70.7	85.8	150.8	1.8	11.0	2
	8	●	**1010S11H08**	102.2	117.3	183.8	1.8	11.0	2
10.2	3	●	**MDE 1020S11H03**	39.1	54.4	117.9	1.9	11.0	2
	5	●	**1020S11H05**	70.6	85.9	150.9	1.9	11.0	2
	8	●	**1020S11H08**	102.1	117.4	183.9	1.9	11.0	2
10.3	3	●	**MDE 1030S11H03**	39.0	54.4	117.9	1.9	11.0	2
	5	●	**1030S11H05**	70.5	85.9	150.9	1.9	11.0	2
	8	●	**1030S11H08**	102.0	117.4	183.9	1.9	11.0	2
10.4	3	●	**MDE 1040S11H03**	38.8	54.4	117.9	1.9	11.0	2
	5	●	**1040S11H05**	70.3	85.9	150.9	1.9	11.0	2
	8	●	**1040S11H08**	101.8	117.4	183.9	1.9	11.0	2

Grade: ACT100

Diameter ø10.5 to 11.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.5	3	●	**MDE 1050S11H03**	38.7	54.4	117.9	1.9	11.0	2
	5	●	**1050S11H05**	70.2	85.9	150.9	1.9	11.0	2
	8	●	**1050S11H08**	101.7	117.4	183.9	1.9	11.0	2
10.6	3	●	**MDE 1060S11H03**	41.0	56.9	117.9	1.9	11.0	2
	5	●	**1060S11H05**	74.0	89.9	150.9	1.9	11.0	2
	8	●	**1060S11H08**	107.0	122.9	183.9	1.9	11.0	2
10.7	3	●	**MDE 1070S11H03**	40.9	56.9	117.9	1.9	11.0	2
	5	●	**1070S11H05**	73.9	89.9	150.9	1.9	11.0	2
	8	●	**1070S11H08**	106.9	122.9	183.9	1.9	11.0	2
10.8	3	●	**MDE 1080S11H03**	40.8	57.0	118.0	2.0	11.0	2
	5	●	**1080S11H05**	73.8	90.0	151.0	2.0	11.0	2
	8	●	**1080S11H08**	106.8	123.0	184.0	2.0	11.0	2
10.9	3	●	**MDE 1090S11H03**	40.7	57.0	118.0	2.0	11.0	2
	5	●	**1090S11H05**	73.7	90.0	151.0	2.0	11.0	2
	8	●	**1090S11H08**	106.7	123.0	184.0	2.0	11.0	2
11.0	3	●	**MDE 1100S11H03**	40.5	57.0	118.0	2.0	11.0	2
	5	●	**1100S11H05**	73.5	90.0	151.0	2.0	11.0	2
	8	●	**1100S11H08**	106.5	123.0	184.0	2.0	11.0	2
11.1	3	●	**MDE 1110S12H03**	42.9	59.5	124.0	2.0	12.0	2
	5	●	**1110S12H05**	77.4	94.0	160.0	2.0	12.0	2
	8	●	**1110S12H08**	111.9	128.5	196.0	2.0	12.0	2
11.2	3	●	**MDE 1120S12H03**	42.7	59.5	124.0	2.0	12.0	2
	5	●	**1120S12H05**	77.2	94.0	160.0	2.0	12.0	2
	8	●	**1120S12H08**	111.7	128.5	196.0	2.0	12.0	2
11.22	5	●	**MDE 1122S12H05**	77.2	94.0	160.0	2.0	12.0	2
11.24	5	●	**1124S12H05**	77.2	94.0	160.0	2.0	12.0	2
11.3	3	●	**MDE 1130S12H03**	42.7	59.6	124.1	2.1	12.0	2
	5	●	**1130S12H05**	77.2	94.1	160.1	2.1	12.0	2
	8	●	**1130S12H08**	111.7	128.6	196.1	2.1	12.0	2
11.36	5	●	**MDE 1136S12H05**	77.0	94.1	160.1	2.1	12.0	2
11.38	5	●	**1138S12H05**	77.0	94.1	160.1	2.1	12.0	2
11.4	3	●	**MDE 1140S12H03**	42.5	59.6	124.1	2.1	12.0	2
	5	●	**1140S12H05**	77.0	94.1	160.1	2.1	12.0	2
	8	●	**1140S12H08**	111.5	128.6	196.1	2.1	12.0	2
11.5	3	●	**MDE 1150S12H03**	42.4	59.6	124.1	2.1	12.0	2
	5	●	**1150S12H05**	76.9	94.1	160.1	2.1	12.0	2
	8	●	**1150S12H08**	111.4	128.6	196.1	2.1	12.0	2
11.6	3	●	**MDE 1160S12H03**	44.7	62.1	124.1	2.1	12.0	2
	5	●	**1160S12H05**	80.7	98.1	160.1	2.1	12.0	2
	8	●	**1160S12H08**	116.7	134.1	196.1	2.1	12.0	2
11.7	3	●	**MDE 1170S12H03**	44.6	62.1	124.1	2.1	12.0	2
	5	●	**1170S12H05**	80.6	98.1	160.1	2.1	12.0	2
	8	●	**1170S12H08**	116.6	134.1	196.1	2.1	12.0	2

Grade: ACT100

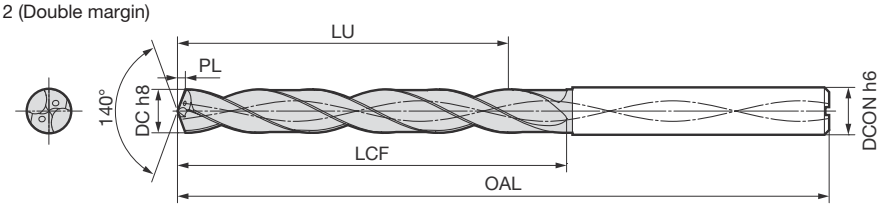
NeXEO MDE-H type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.26% | Carbon Steel/ Alloy Steel from 0.25% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy | Copper Alloy

NX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (Double margin)



Diameter ø11.8 to 13.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
11.8	3	●	MDE 1180S12H03	44.4	62.1	124.1	2.1	12.0	2
	5	●	1180S12H05	80.4	98.1	160.1	2.1	12.0	2
	8	●	1180S12H08	116.4	134.1	196.1	2.1	12.0	2
11.9	3	●	MDE 1190S12H03	44.4	62.2	124.2	2.2	12.0	2
	5	●	1190S12H05	80.4	98.2	160.2	2.2	12.0	2
	8	●	1190S12H08	116.4	134.2	196.2	2.2	12.0	2
12.0	3	●	MDE 1200S12H03	44.2	62.2	124.2	2.2	12.0	2
	5	●	1200S12H05	80.2	98.2	160.2	2.2	12.0	2
	8	●	1200S12H08	116.2	134.2	196.2	2.2	12.0	2
12.1	3	●	MDE 1210S13H03	46.6	64.7	130.2	2.2	13.0	2
	5	●	1210S13H05	84.1	102.2	169.2	2.2	13.0	2
	8	●	1210S13H08	121.6	139.7	208.2	2.2	13.0	2
12.2	3	●	MDE 1220S13H03	46.4	64.7	130.2	2.2	13.0	2
	5	●	1220S13H05	83.9	102.2	169.2	2.2	13.0	2
	8	●	1220S13H08	121.4	139.7	208.2	2.2	13.0	2
12.3	3	●	MDE 1230S13H03	46.3	64.7	130.2	2.2	13.0	2
	5	●	1230S13H05	83.8	102.2	169.2	2.2	13.0	2
	8	●	1230S13H08	121.3	139.7	208.2	2.2	13.0	2
12.4	3	●	MDE 1240S13H03	46.2	64.8	130.3	2.3	13.0	2
	5	●	1240S13H05	83.7	102.3	169.3	2.3	13.0	2
	8	●	1240S13H08	121.2	139.8	208.3	2.3	13.0	2
12.5	3	●	MDE 1250S13H03	46.1	64.8	130.3	2.3	13.0	2
	5	●	1250S13H05	83.6	102.3	169.3	2.3	13.0	2
	8	●	1250S13H08	121.1	139.8	208.3	2.3	13.0	2
12.6	3	●	MDE 1260S13H03	48.4	67.3	130.3	2.3	13.0	2
	5	●	1260S13H05	87.4	106.3	169.3	2.3	13.0	2
	8	●	1260S13H08	126.4	145.3	208.3	2.3	13.0	2
12.7	3	●	MDE 1270S13H03	48.3	67.3	130.3	2.3	13.0	2
	5	●	1270S13H05	87.3	106.3	169.3	2.3	13.0	2
	8	●	1270S13H08	126.3	145.3	208.3	2.3	13.0	2
12.8	3	●	MDE 1280S13H03	48.1	67.3	130.3	2.3	13.0	2
	5	●	1280S13H05	87.1	106.3	169.3	2.3	13.0	2
	8	●	1280S13H08	126.1	145.3	208.3	2.3	13.0	2
12.9	3	●	MDE 1290S13H03	48.0	67.3	130.3	2.3	13.0	2
	5	●	1290S13H05	87.0	106.3	169.3	2.3	13.0	2
	8	●	1290S13H08	126.0	145.3	208.3	2.3	13.0	2
13.0	3	●	MDE 1300S13H03	47.9	67.4	130.4	2.4	13.0	2
	5	●	1300S13H05	86.9	106.4	169.4	2.4	13.0	2
	8	●	1300S13H08	125.9	145.4	208.4	2.4	13.0	2
13.1	3	●	MDE 1310S14H03	50.3	69.9	136.4	2.4	14.0	2
	5	●	1310S14H05	90.8	110.4	178.4	2.4	14.0	2
	8	●	1310S14H08	131.3	150.9	220.4	2.4	14.0	2

Grade: ACT100

Diameter ø13.2 to 14.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
13.2	3	●	MDE 1320S14H03	50.1	69.9	136.4	2.4	14.0	2
	5	●	1320S14H05	90.6	110.4	178.4	2.4	14.0	2
	8	●	1320S14H08	131.1	150.9	220.4	2.4	14.0	2
13.3	3	●	MDE 1330S14H03	50.0	69.9	136.4	2.4	14.0	2
	5	●	1330S14H05	90.5	110.4	178.4	2.4	14.0	2
	8	●	1330S14H08	131.0	150.9	220.4	2.4	14.0	2
13.4	3	●	MDE 1340S14H03	49.8	69.9	136.4	2.4	14.0	2
	5	●	1340S14H05	90.3	110.4	178.4	2.4	14.0	2
	8	●	1340S14H08	130.8	150.9	220.4	2.4	14.0	2
13.5	3	●	MDE 1350S14H03	49.8	70.0	136.5	2.5	14.0	2
	5	●	1350S14H05	90.3	110.5	178.5	2.5	14.0	2
	8	●	1350S14H08	130.8	151.0	220.5	2.5	14.0	2
13.6	3	●	MDE 1360S14H03	52.1	72.5	136.5	2.5	14.0	2
	5	●	1360S14H05	94.1	114.5	178.5	2.5	14.0	2
	8	●	1360S14H08	136.1	156.5	220.5	2.5	14.0	2
13.7	3	●	MDE 1370S14H03	52.0	72.5	136.5	2.5	14.0	2
	5	●	1370S14H05	94.0	114.5	178.5	2.5	14.0	2
	8	●	1370S14H08	136.0	156.5	220.5	2.5	14.0	2
13.8	3	●	MDE 1380S14H03	51.8	72.5	136.5	2.5	14.0	2
	5	●	1380S14H05	93.8	114.5	178.5	2.5	14.0	2
	8	●	1380S14H08	135.8	156.5	220.5	2.5	14.0	2
13.9	3	●	MDE 1390S14H03	51.7	72.5	136.5	2.5	14.0	2
	5	●	1390S14H05	93.7	114.5	178.5	2.5	14.0	2
	8	●	1390S14H08	135.7	156.5	220.5	2.5	14.0	2
14.0	3	●	MDE 1400S14H03	51.5	72.5	136.5	2.5	14.0	2
	5	●	1400S14H05	93.5	114.5	178.5	2.5	14.0	2
	8	●	1400S14H08	135.5	156.5	220.5	2.5	14.0	2
14.1	3	●	MDE 1410S15H03	54.0	75.1	142.6	2.6	15.0	2
	5	●	1410S15H05	97.5	118.6	187.6	2.6	15.0	2
	8	●	1410S15H08	141.0	162.1	232.6	2.6	15.0	2
14.2	3	●	MDE 1420S15H03	53.8	75.1	142.6	2.6	15.0	2
	5	●	1420S15H05	97.3	118.6	187.6	2.6	15.0	2
	8	●	1420S15H08	140.8	162.1	232.6	2.6	15.0	2
14.3	3	●	MDE 1430S15H03	53.7	75.1	142.6	2.6	15.0	2
	5	●	1430S15H05	97.2	118.6	187.6	2.6	15.0	2
	8	●	1430S15H08	140.7	162.1	232.6	2.6	15.0	2
14.4	3	●	MDE 1440S15H03	53.5	75.1	142.6	2.6	15.0	2
	5	●	1440S15H05	97.0	118.6	187.6	2.6	15.0	2
	8	●	1440S15H08	140.5	162.1	232.6	2.6	15.0	2
14.5	3	●	MDE 1450S15H03	53.4	75.1	142.6	2.6	15.0	2
	5	●	1450S15H05	96.9	118.6	187.6	2.6	15.0	2
	8	●	1450S15H08	140.4	162.1	232.6	2.6	15.0	2

Grade: ACT100

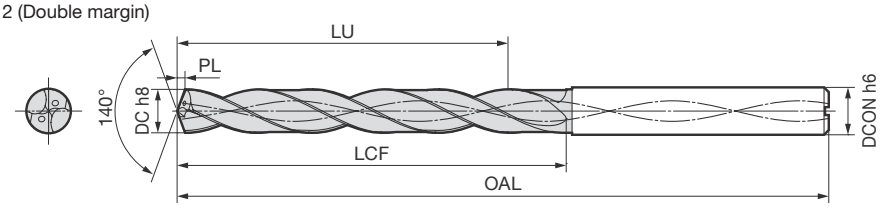
NeXEO MDE-H type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy | Copper Alloy

NX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (Double margin)



Diameter ø14.6 to 15.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
14.6	3	●	MDE 1460S15H03	55.8	77.7	142.7	2.7	15.0	2
	5	●	1460S15H05	100.8	122.7	187.7	2.7	15.0	2
	8	●	1460S15H08	145.8	167.7	232.7	2.7	15.0	2
14.7	3	●	MDE 1470S15H03	55.7	77.7	142.7	2.7	15.0	2
	5	●	1470S15H05	100.7	122.7	187.7	2.7	15.0	2
	8	●	1470S15H08	145.7	167.7	232.7	2.7	15.0	2
14.8	3	●	MDE 1480S15H03	55.5	77.7	142.7	2.7	15.0	2
	5	●	1480S15H05	100.5	122.7	187.7	2.7	15.0	2
	8	●	1480S15H08	145.5	167.7	232.7	2.7	15.0	2
14.9	3	●	MDE 1490S15H03	55.4	77.7	142.7	2.7	15.0	2
	5	●	1490S15H05	100.4	122.7	187.7	2.7	15.0	2
	8	●	1490S15H08	145.4	167.7	232.7	2.7	15.0	2
15.0	3	●	MDE 1500S15H03	55.2	77.7	142.7	2.7	15.0	2
	5	●	1500S15H05	100.2	122.7	187.7	2.7	15.0	2
	8	●	1500S15H08	145.2	167.7	232.7	2.7	15.0	2
15.1	3	●	MDE 1510S16H03	57.6	80.2	148.7	2.7	16.0	2
	5	●	1510S16H05	104.1	126.7	196.7	2.7	16.0	2
	8	●	1510S16H08	150.6	173.2	244.7	2.7	16.0	2
15.2	3	●	MDE 1520S16H03	57.5	80.3	148.8	2.8	16.0	2
	5	●	1520S16H05	104.0	126.8	196.8	2.8	16.0	2
	8	●	1520S16H08	150.5	173.3	244.8	2.8	16.0	2
15.3	3	●	MDE 1530S16H03	57.4	80.3	148.8	2.8	16.0	2
	5	●	1530S16H05	103.9	126.8	196.8	2.8	16.0	2
	8	●	1530S16H08	150.4	173.3	244.8	2.8	16.0	2
15.4	3	●	MDE 1540S16H03	57.2	80.3	148.8	2.8	16.0	2
	5	●	1540S16H05	103.7	126.8	196.8	2.8	16.0	2
	8	●	1540S16H08	150.2	173.3	244.8	2.8	16.0	2
15.5	3	●	MDE 1550S16H03	57.1	80.3	148.8	2.8	16.0	2
	5	●	1550S16H05	103.6	126.8	196.8	2.8	16.0	2
	8	●	1550S16H08	150.1	173.3	244.8	2.8	16.0	2
15.6	3	●	MDE 1560S16H03	59.4	82.8	148.8	2.8	16.0	2
	5	●	1560S16H05	107.4	130.8	196.8	2.8	16.0	2
	8	●	1560S16H08	155.4	178.8	244.8	2.8	16.0	2
15.7	3	●	MDE 1570S16H03	59.4	82.9	148.9	2.9	16.0	2
	5	●	1570S16H05	107.4	130.9	196.9	2.9	16.0	2
	8	●	1570S16H08	155.4	178.9	244.9	2.9	16.0	2
15.8	3	●	MDE 1580S16H03	59.2	82.9	148.9	2.9	16.0	2
	5	●	1580S16H05	107.2	130.9	196.9	2.9	16.0	2
	8	●	1580S16H08	155.2	178.9	244.9	2.9	16.0	2
15.9	3	●	MDE 1590S16H03	59.1	82.9	148.9	2.9	16.0	2
	5	●	1590S16H05	107.1	130.9	196.9	2.9	16.0	2
	8	●	1590S16H08	155.1	178.9	244.9	2.9	16.0	2

Grade: ACT100

Diameter ø16.0 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
16.0	3	●	MDE 1600S16H03	58.9	82.9	148.9	2.9	16.0	2
	5	●	1600S16H05	106.9	130.9	196.9	2.9	16.0	2
	8	●	1600S16H08	154.9	178.9	244.9	2.9	16.0	2
16.5	3	●	MDE 1650S17H03	60.8	85.5	155.0	3.0	17.0	2
	5	●	1650S17H05	110.3	135.0	206.0	3.0	17.0	2
17.0	3	●	MDE 1700S17H03	62.6	88.1	155.1	3.1	17.0	2
	5	●	1700S17H05	113.6	139.1	206.1	3.1	17.0	2
17.5	3	●	MDE 1750S18H03	64.5	90.7	161.2	3.2	18.0	2
	5	●	1750S18H05	116.9	143.2	217.3	3.2	18.0	2
18.0	3	●	MDE 1800S18H03	66.3	93.3	161.3	3.3	18.0	2
	5	●	1800S18H05	120.3	147.3	217.3	3.3	18.0	2
18.5	3	●	MDE 1850S19H03	68.2	95.9	167.4	3.4	19.0	2
	5	●	1850S19H05	123.6	151.4	224.4	3.4	19.0	2
19.0	3	●	MDE 1900S19H03	70.0	98.5	167.5	3.5	19.0	2
	5	●	1900S19H05	127.0	155.5	224.5	3.5	19.0	2
19.5	3	●	MDE 1950S20H03	71.8	101.0	173.5	3.5	20.0	2
	5	●	1950S20H05	130.3	159.5	233.5	3.5	20.0	2
20.0	3	●	MDE 2000S20H03	73.6	103.6	173.6	3.6	20.0	2
	5	●	2000S20H05	133.6	163.6	233.6	3.6	20.0	2

Grade: ACT100

NeXEO MDE-H type (Internal Coolant Supply)

Recommended Cutting Conditions (MDE-H type, internal coolant supply, 3D/5D/8D)

1. The recommended cutting conditions below are for cases where a water soluble coolant is used.
2. MQL coolant is also usable. Note that external mixing MQL equipment may not generate MQL with a shank diameter (DCON) of ø16mm or more.
3. When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
4. Make sure the flute does not enter the collet.
5. If the surface of the workpiece is abnormally shaped (tilted, interrupted etc.), reduce the feed rate to about half when feeding the drill in the workpiece.
   * If stable drilling is still not possible, pre-drilling of a flat surface with a Flat MULTIDRILL MDF series drill is recommended.
6. When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.

Work Material		Mild Steel/Low Carbon Steel SS400/S15C up to 160HB		Carbon Steel S35C/S50C up to 230HB		Alloy Steel SCM/SCr 20 to 30HRC		Alloy Steel SCM/SCr 30 to 38HRC	
Cutting Speed	Dia. < ø3	30 to 80m/min		30 to 80m/min		30 to 80m/min		30 to 80m/min	
	Dia. ≥ ø3	60 to 100m/min		60 to 120m/min		50 to 100m/min		40 to 80m/min	
Diameter DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.03 to 0.06
ø2.0		9,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.04 to 0.08
ø2.5		9,500	0.04 to 0.08	9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.04 to 0.08
ø3.0		9,600	0.05 to 0.12	8,500	0.05 to 0.12	7,500	0.05 to 0.12	6,400	0.05 to 0.12
ø4.0		7,200	0.07 to 0.17	6,400	0.07 to 0.17	5,600	0.07 to 0.17	4,800	0.07 to 0.17
ø5.0		5,800	0.08 to 0.20	5,100	0.08 to 0.20	4,500	0.08 to 0.20	3,900	0.08 to 0.20
ø6.0		4,800	0.10 to 0.20	4,300	0.10 to 0.20	3,800	0.10 to 0.20	3,200	0.10 to 0.20
ø7.0		4,100	0.12 to 0.23	3,700	0.12 to 0.23	3,200	0.12 to 0.23	2,800	0.12 to 0.23
ø8.0		3,600	0.12 to 0.25	3,200	0.12 to 0.25	2,800	0.12 to 0.25	2,400	0.12 to 0.25
ø9.0		3,200	0.14 to 0.25	2,900	0.14 to 0.25	2,500	0.14 to 0.25	2,200	0.14 to 0.25
ø10.0		2,900	0.16 to 0.28	2,600	0.16 to 0.28	2,300	0.16 to 0.28	2,000	0.16 to 0.28
ø11.0		2,700	0.18 to 0.30	2,400	0.18 to 0.30	2,100	0.18 to 0.30	1,800	0.18 to 0.30
ø12.0		2,400	0.20 to 0.30	2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30
ø14.0		2100	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30
ø16.0		1,800	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.20 to 0.30
ø18.0		1,600	0.20 to 0.30	1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.20 to 0.30
ø20.0		1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.20 to 0.30
High-efficiency Product		HGS series		HGS series		HGS series		HGS series	

Work Material		Cast Iron FC250 to 280HB		Ductile Cast Iron FCD450/FCD600 to 270HB		Stainless Steel SUS304/SUS410 to 200HB		Special Steel/Pre-hardened Steel SKS2/SKD61 (non-tempered) 30 to 38HRC	
Cutting Speed	Dia. < ø3	30 to 80m/min		30 to 80m/min		30 to 80m/min		30 to 60m/min	
	Dia. ≥ ø3	60 to 100m/min		50 to 100m/min		40 to 80m/min		30 to 60m/min	
Diameter DC (mm)		Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)
ø1.0		9,500	0.02 to 0.04	9,500	0.02 to 0.04	9,500	0.02 to 0.03	9,500	0.02 to 0.03
ø1.5		8,500	0.03 to 0.06	8,500	0.03 to 0.06	8,500	0.02 to 0.05	8,500	0.02 to 0.04
ø2.0		8,000	0.04 to 0.08	8,000	0.04 to 0.08	8,000	0.03 to 0.06	7,100	0.03 to 0.06
ø2.5		9,000	0.04 to 0.08	8,500	0.04 to 0.08	7,600	0.03 to 0.07	5,700	0.03 to 0.06
ø3.0		8,500	0.06 to 0.15	7,500	0.05 to 0.12	6,400	0.05 to 0.12	4,800	0.05 to 0.10
ø4.0		6,400	0.08 to 0.18	5,600	0.07 to 0.17	4,800	0.07 to 0.17	3,600	0.06 to 0.13
ø5.0		5,100	0.10 to 0.20	4,500	0.08 to 0.20	3,900	0.08 to 0.20	2,900	0.07 to 0.15
ø6.0		4,300	0.12 to 0.23	3,800	0.10 to 0.20	3,200	0.10 to 0.20	2,400	0.08 to 0.18
ø7.0		3,700	0.12 to 0.23	3,200	0.12 to 0.23	2,800	0.10 to 0.23	2,100	0.10 to 0.20
ø8.0		3,200	0.18 to 0.25	2,800	0.12 to 0.25	2,400	0.10 to 0.20	1,800	0.12 to 0.22
ø9.0		2,900	0.17 to 0.25	2,500	0.14 to 0.25	2,200	0.12 to 0.23	1,600	0.14 to 0.22
ø10.0		2,600	0.18 to 0.28	2,300	0.16 to 0.28	2,000	0.12 to 0.23	1,500	0.16 to 0.25
ø11.0		2,400	0.20 to 0.30	2,100	0.18 to 0.30	1,800	0.15 to 0.25	1,400	0.18 to 0.28
ø12.0		2,200	0.20 to 0.30	1,900	0.20 to 0.30	1,600	0.15 to 0.25	1,200	0.18 to 0.28
ø14.0		1,900	0.20 to 0.30	1,600	0.20 to 0.30	1,400	0.15 to 0.25	1,100	0.18 to 0.30
ø16.0		1,600	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.15 to 0.25	900	0.18 to 0.30
ø18.0		1,500	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.15 to 0.25	800	0.18 to 0.30
ø20.0		1,300	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.15 to 0.25	720	0.18 to 0.30
High-efficiency Product		HX series (HY series)		HX series (HY series)		MDM series		HGS series	

MDF series

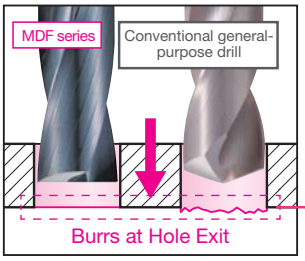
■ General Features

The Flat MULTIDRILL MDF series is a solid carbide drill that can be used for various applications, including high-efficiency flat bottom drilling and drilling in inclined and curved surfaces.

■ Features and Applications

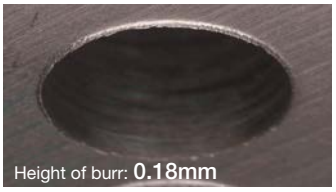
- Suited to various types of drilling thanks to a point angle of 180°
  Suitable for high-efficiency flat bottom drilling, drilling on non-flat surfaces such as inclined and cylindrical surfaces, and interrupted drilling. Also reduces burrs at the hole exit.
- Improves drilling stability
  Achieves high rigidity by employing RS THINNING, which ensures thick web.
- Excellent chip evacuation
  Achieves excellent chip evacuation thanks to the wide chip pocket and high-quality rake face shape.
- Excellent cutting edge strength
  Achieves excellent cutting edge strength through optimised cutting edge design.
- Coolant can now be supplied internally
  This enables deeper drilling.

■ Reduction of Burrs at Hole Exit

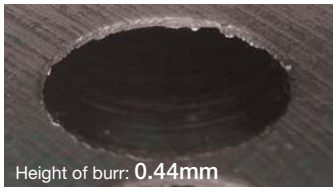


Work Material: SCM415
Machine: BT40 Vertical Machining Centre
Tool: MDF 0500S2D (ø5.0mm x 2D)
Cutting Conditions: Vc = 65m/min, f = 0.12mm/rev, H = 10mm, 150 holes, Wet

Reduces exit burrs by **half** compared with **general-purpose** drills

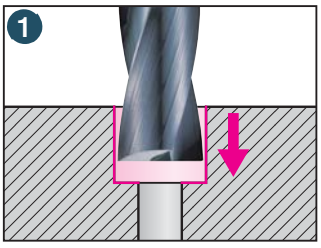


Flat MULTIDRILL MDF series

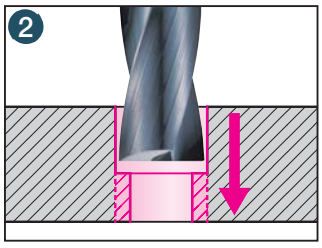


Conventional general-purpose drill

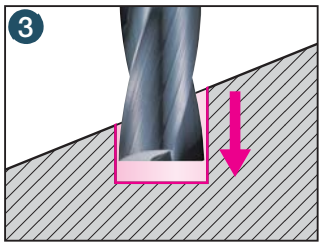
■ Drilling Applications



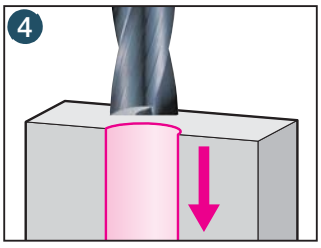
High-efficiency flat bottom drilling



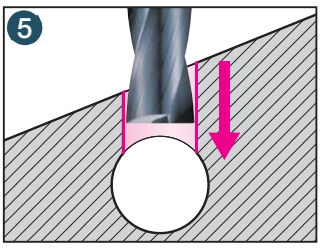
Hole expansion drilling



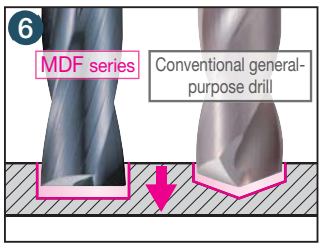
Drilling in non-horizontal surface (inclined surface, cylindrical surface, etc.)



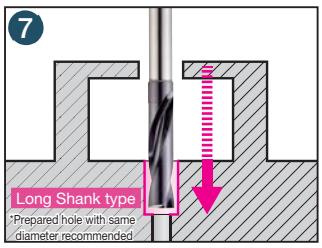
Interrupted drilling



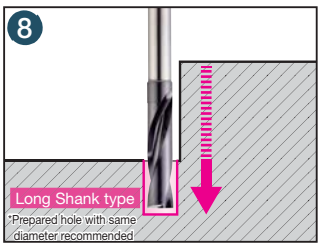
Cross-hole drilling



Pre-tap hole drilling in thin plates



Flat Bottom Drilling at deep positions



Avoids interference with work material

Long shanked type (MDF-L type 2D) for flat bottom drilling, hole expansion and burr control in long overhang conditions

- For drilling with long overhang and to avoid interference with the work material.

*A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed for drilling with the long shank type.

DC < 6mm, stepped shank

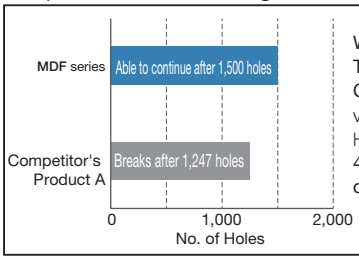
DC ≥ 6mm, relief shank

With Oil Hole (MDF-H type 3D/5D) for up to 5D deep hole applications

- Internal coolant supply enables deep flat bottom hole drilling.

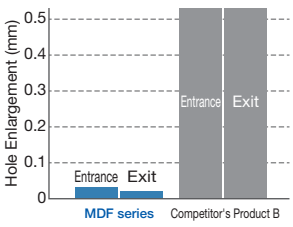
*A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed for drilling with an L/D=5 oil hole.

Deep Flat Bottom Drilling



Work Material: S50C
Tool: MDF 0600H5D (ø6)
Cutting Conditions:
vc = 140m/min, f = 0.15mm/rev
H = 30mm (5D), Internal Coolant Supply
45mm overhang, prepared hole depth 3mm (ø6)

Long Overhang Flat Bottom Drilling

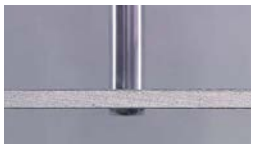


Work Material: S50C
Tool: MDF 0600H3D (ø6)
Cutting Conditions:
vc = 90m/min, f = 0.1mm/rev
H = 18mm (3D), Internal Coolant Supply
Overhang 35mm

Drilling on slanted surfaces

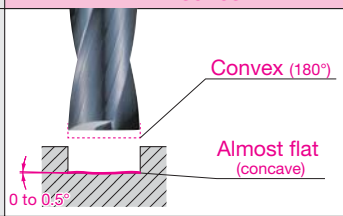
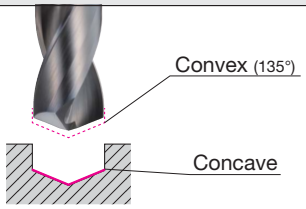
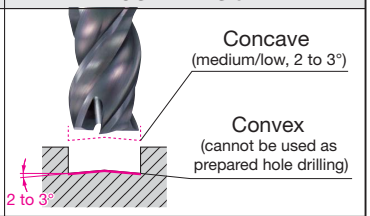
Work Material: SCM415
Tool: MDF 0500S2D (ø5)
Cutting Conditions:
vc = 65m/min, f = 0.08mm/rev
H = 10mm, External MQL

Prevents burrs and conical remnants on tool withdrawal



Work Material: SS400
Tool: MDF 1000S2D (ø10)
Cutting Conditions:
vc = 75m/min, f = 0.12mm/rev
H = 5mm, External MQL

■ Distinguishing Flat Drills, General-purpose Drills and Endmills

Tool	Flat Drill **MDF series**		General-purpose Drill GS/HGS series		Endmill for Flat Bottom Drilling GSXMILL Slot	
Shape of hole base						
Drilling in flat surfaces	○	Approx. 1/2 the feed of a general-purpose drill	◎	Best	△	Only for low feed 1D or smaller ≤1/5 the feed of a general-purpose drill
Drilling non-flat surfaces	◎	Ideal (2D or smaller recommended)	×	Impossible	○	Only for low feed 1D or smaller ≤1/2 the feed of a flat drill
Traverse Cutting	×	Impossible	×	Impossible	◎	Best

■ Product Range

Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Description
External	MDF□□□□S2D	ø0.3 to 20.0	up to 2	188 items in stock
	MDF□□□□L2D	ø3.0 to 20.0	up to 2	115 items in stock
Internal	MDF□□□□H3D	ø3.0 to 16.0	up to 3	99 items in stock
	MDF□□□□H5D	ø3.0 to 16.0	up to 5	99 items in stock

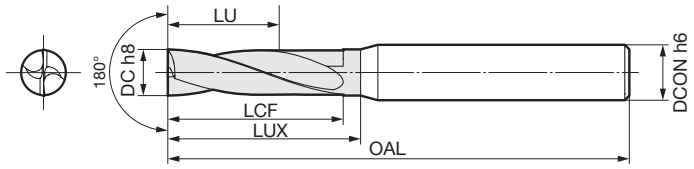
MDF-S type (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.28% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

PVD Coat | 2D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø0.3 to 5.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
0.3*		●	MDF 0030S2D*	0.9	1.0	1.3	40	3.0	1
0.4*		●	0040S2D*	1.2	1.4	1.7	40	3.0	1
0.5		●	0050S2D	1.5	2.0	2.3	40	3.0	1
0.6	2	●	0060S2D	1.8	2.4	2.7	40	3.0	1
0.7		●	0070S2D	2.1	2.8	3.1	40	3.0	1
0.8		●	0080S2D	2.4	3.2	3.5	40	3.0	1
0.9		●	0090S2D	2.7	3.6	3.9	40	3.0	1
1.0		●	MDF 0100S2D	3.0	4.0	4.3	45	3.0	1
1.1		●	0110S2D	3.3	4.4	4.7	45	3.0	1
1.2		●	0120S2D	3.6	4.8	5.1	45	3.0	1
1.3		●	0130S2D	3.9	5.2	5.5	45	3.0	1
1.4	2	●	0140S2D	4.2	5.6	5.9	45	3.0	1
1.5		●	0150S2D	4.5	6.0	6.3	45	3.0	1
1.6		●	0160S2D	4.8	6.4	6.7	45	3.0	1
1.7		●	0170S2D	5.1	6.8	7.1	45	3.0	1
1.8		●	0180S2D	5.4	7.2	7.5	45	3.0	1
1.9		●	0190S2D	5.7	7.6	7.9	45	3.0	1
2.0		●	MDF 0200S2D	6.0	8.0	8.3	50	4.0	1
2.1		●	0210S2D	6.3	8.4	8.7	50	4.0	1
2.2		●	0220S2D	6.6	8.8	9.1	50	4.0	1
2.3		●	0230S2D	6.9	9.2	9.5	50	4.0	1
2.4		●	0240S2D	7.2	9.6	9.9	50	4.0	1
2.5		●	0250S2D	7.5	10.0	10.5	50	4.0	1
2.6		●	0260S2D	7.8	10.4	11.1	50	4.0	1
2.7		●	0270S2D	8.1	10.8	11.7	50	4.0	1
2.76		●	0276S2D	8.3	11.0	12.0	50	4.0	1
2.78		●	0278S2D	8.3	11.1	12.1	50	4.0	1
2.8		●	0280S2D	8.4	11.2	12.2	50	4.0	1
2.9		●	0290S2D	8.7	11.6	12.8	50	4.0	1
3.0	2	●	0300S2D	9.0	12.0	12.3	50	6.0	1
3.1		●	0310S2D	9.3	12.4	12.7	50	6.0	1
3.2		●	0320S2D	9.6	12.8	13.1	50	6.0	1
3.3		●	0330S2D	9.9	13.2	13.5	50	6.0	1
3.4		●	0340S2D	10.2	13.6	13.9	50	6.0	1
3.5		●	0350S2D	10.5	14.0	14.3	50	6.0	1
3.6		●	0360S2D	10.8	14.4	14.9	50	6.0	1
3.66		●	0366S2D	10.9	14.6	15.3	50	6.0	1
3.68		●	0368S2D	11.0	14.7	15.4	50	6.0	1
3.7		●	0370S2D	11.1	14.8	15.5	50	6.0	1
3.8		●	0380S2D	11.4	15.2	16.0	50	6.0	1
3.9		●	0390S2D	11.7	15.6	16.6	50	6.0	1
4.0		●	0400S2D	12.0	16.0	17.2	50	6.0	1
4.1		●	MDF 0410S2D	12.3	16.4	17.8	60	6.0	1
4.2		●	0420S2D	12.6	16.8	18.4	60	6.0	1
4.3		●	0430S2D	12.9	17.2	18.9	60	6.0	1
4.4		●	0440S2D	13.2	17.6	19.5	60	6.0	1
4.5		●	0450S2D	13.5	18.0	20.1	60	6.0	1
4.6		●	0460S2D	13.8	18.4	20.7	60	6.0	1
4.62	2	●	0462S2D	13.8	18.4	20.9	60	6.0	1
4.64		●	0464S2D	13.9	18.5	21.0	60	6.0	1
4.7		●	0470S2D	14.1	18.8	21.3	60	6.0	1
4.8		●	0480S2D	14.4	19.2	21.8	60	6.0	1
4.9		●	0490S2D	14.7	19.6	22.4	60	6.0	1
5.0		●	0500S2D	15.0	20.0	23.0	60	6.0	1
5.1		●	0510S2D	15.3	20.4	23.6	60	6.0	1

*RS thinning is used for ø0.5mm and larger sizes.
Grade: ACF75

Diameter ø5.2 to 9.52mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
5.2		●	MDF 0520S2D	15.6	20.8	24.2	60	6.0	1
5.3		●	0530S2D	15.9	21.2	24.7	60	6.0	1
5.4		●	0540S2D	16.2	21.6	25.3	60	6.0	1
5.5		●	0550S2D	16.5	22.0	25.9	60	6.0	1
5.52		●	0552S2D	16.5	22.0	26.1	60	6.0	1
5.54	2	●	0554S2D	16.6	22.1	26.2	60	6.0	1
5.6		●	0560S2D	16.8	22.4	26.5	60	6.0	1
5.7		●	0570S2D	17.1	22.8	27.1	60	6.0	1
5.8		●	0580S2D	17.4	23.2	27.6	60	6.0	1
5.9		●	0590S2D	17.7	23.6	28.2	60	6.0	1
6.0		●	MDF 0600S2D	18.0	24.0	28.8	60	6.0	1
6.1		●	0610S2D	18.3	24.4	27.4	70	8.0	1
6.2		●	0620S2D	18.6	24.8	28.0	70	8.0	1
6.3		●	0630S2D	18.9	25.2	28.5	70	8.0	1
6.4		●	0640S2D	19.2	25.6	29.1	70	8.0	1
6.5		●	0650S2D	19.5	26.0	29.7	70	8.0	1
6.6		●	0660S2D	19.8	26.4	30.3	70	8.0	1
6.7		●	0670S2D	20.1	26.8	30.9	70	8.0	1
6.8		●	0680S2D	20.4	27.2	31.4	70	8.0	1
6.9		●	0690S2D	20.7	27.6	32.0	70	8.0	1
7.0		●	0700S2D	21.0	28.0	32.6	70	8.0	1
7.1		●	0710S2D	21.3	28.4	33.2	70	8.0	1
7.2	2	●	0720S2D	21.6	28.8	33.8	70	8.0	1
7.3		●	0730S2D	21.9	29.2	34.3	70	8.0	1
7.36		●	0736S2D	22.0	29.4	34.7	70	8.0	1
7.38		●	0738S2D	22.1	29.5	34.8	70	8.0	1
7.4		●	0740S2D	22.2	29.6	34.9	70	8.0	1
7.5		●	0750S2D	22.5	30.0	35.5	70	8.0	1
7.52		●	0752S2D	22.5	30.0	35.7	70	8.0	1
7.54		●	0754S2D	22.6	30.1	35.8	70	8.0	1
7.6		●	0760S2D	22.8	30.4	36.1	70	8.0	1
7.7		●	0770S2D	23.1	30.8	36.7	70	8.0	1
7.8		●	0780S2D	23.4	31.2	37.2	70	8.0	1
7.9		●	0790S2D	23.7	31.6	37.8	70	8.0	1
8.0		●	0800S2D	24.0	32.0	38.4	70	8.0	1
8.1		●	MDF 0810S2D	24.3	32.4	37.0	80	10.0	1
8.2		●	0820S2D	24.6	32.8	37.6	80	10.0	1
8.3		●	0830S2D	24.9	33.2	38.1	80	10.0	1
8.4		●	0840S2D	25.2	33.6	38.7	80	10.0	1
8.5		●	0850S2D	25.5	34.0	39.3	80	10.0	1
8.6		●	0860S2D	25.8	34.4	39.9	80	10.0	1
8.7		●	0870S2D	26.1	34.8	40.5	80	10.0	1
8.8		●	0880S2D	26.4	35.2	41.0	80	10.0	1
8.9		●	0890S2D	26.7	35.6	41.6	80	10.0	1
9.0		●	0900S2D	27.0	36.0	42.2	80	10.0	1
9.1	2	●	0910S2D	27.3	36.4	42.8	80	10.0	1
9.2		●	0920S2D	27.6	36.8	43.4	80	10.0	1
9.24		●	0924S2D	27.7	36.9	43.6	80	10.0	1
9.26		●	0926S2D	27.7	37.0	43.7	80	10.0	1
9.3		●	0930S2D	27.9	37.2	43.9	80	10.0	1
9.36		●	0936S2D	28.0	37.4	44.3	80	10.0	1
9.38		●	0938S2D	28.1	37.5	44.4	80	10.0	1
9.4		●	0940S2D	28.2	37.6	44.5	80	10.0	1
9.5		●	0950S2D	28.5	38.0	45.1	80	10.0	1
9.52		●	0952S2D	28.5	38.0	45.3	80	10.0	1

Grade: ACF75

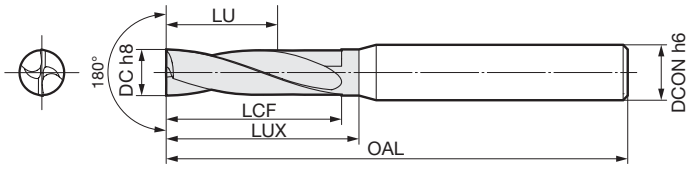
MDF-S type (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.25% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

PVD Coat | 2D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø9.54 to 14.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
9.54	2	●	MDF 0954S2D	28.6	38.1	45.4	80	10.0	1
9.6		●	0960S2D	28.8	38.4	45.7	80	10.0	1
9.7		●	0970S2D	29.1	38.8	46.3	80	10.0	1
9.8		●	0980S2D	29.4	39.2	46.8	80	10.0	1
9.9		●	0990S2D	29.7	39.6	47.4	80	10.0	1
10.0		●	1000S2D	30.0	40.0	48.0	80	10.0	1
10.1	2	●	MDF 1010S2D	30.3	40.4	46.6	90	12.0	1
10.2		●	1020S2D	30.6	40.8	47.2	90	12.0	1
10.3		●	1030S2D	30.9	41.2	47.7	90	12.0	1
10.4		●	1040S2D	31.2	41.6	48.3	90	12.0	1
10.5		●	1050S2D	31.5	42.0	48.9	90	12.0	1
10.6		●	1060S2D	31.8	42.4	49.5	90	12.0	1
10.7		●	1070S2D	32.1	42.8	50.1	90	12.0	1
10.8		●	1080S2D	32.4	43.2	50.6	90	12.0	1
10.9		●	1090S2D	32.7	43.6	51.2	90	12.0	1
11.0		●	1100S2D	33.0	44.0	51.8	90	12.0	1
11.1		●	1110S2D	33.3	44.4	52.4	90	12.0	1
11.2		●	1120S2D	33.6	44.8	53.0	90	12.0	1
11.22		●	1122S2D	33.6	44.8	53.1	90	12.0	1
11.24		●	1124S2D	33.7	44.9	53.2	90	12.0	1
11.3		●	1130S2D	33.9	45.2	53.5	90	12.0	1
11.36		●	1136S2D	34.0	45.4	53.9	90	12.0	1
11.38		●	1138S2D	34.1	45.5	54.0	90	12.0	1
11.4		●	1140S2D	34.2	45.6	54.1	90	12.0	1
11.5		●	1150S2D	34.5	46.0	54.7	90	12.0	1
11.6		●	1160S2D	34.8	46.4	55.3	90	12.0	1
11.7		●	1170S2D	35.1	46.8	55.9	90	12.0	1
11.8		●	1180S2D	35.4	47.2	56.4	90	12.0	1
11.9		●	1190S2D	35.7	47.6	57.0	90	12.0	1
12.0		●	1200S2D	36.0	48.0	57.6	90	12.0	1
12.1	2	●	MDF 1210S2D	36.3	48.4	52.3	100	14.0	1
12.2		●	1220S2D	36.6	48.8	52.7	100	14.0	1
12.3		●	1230S2D	36.9	49.2	53.1	100	14.0	1
12.4		●	1240S2D	37.2	49.6	53.6	100	14.0	1
12.5		●	1250S2D	37.5	50.0	54.0	100	14.0	1
12.6		●	1260S2D	37.8	50.4	55.1	100	14.0	1
12.7		●	1270S2D	38.1	50.8	55.5	100	14.0	1
12.8		●	1280S2D	38.4	51.2	55.9	100	14.0	1
12.9		●	1290S2D	38.7	51.6	56.4	100	14.0	1
13.0		●	1300S2D	39.0	52.0	56.8	100	14.0	1
13.1		●	1310S2D	39.3	52.4	57.8	110	14.0	1
13.2		●	1320S2D	39.6	52.8	58.3	110	14.0	1
13.3		●	1330S2D	39.9	53.2	58.7	110	14.0	1
13.4		●	1340S2D	40.2	53.6	59.2	110	14.0	1
13.5		●	1350S2D	40.5	54.0	59.6	110	14.0	1
13.6		●	1360S2D	40.8	54.4	60.6	110	14.0	1
13.7		●	1370S2D	41.1	54.8	61.1	110	14.0	1
13.8		●	1380S2D	41.4	55.2	61.5	110	14.0	1
13.9		●	1390S2D	41.7	55.6	62.0	110	14.0	1
14.0		●	1400S2D	42.0	56.0	62.4	110	14.0	1
14.1		●	1410S2D	42.3	56.4	63.4	110	16.0	1
14.2		●	1420S2D	42.6	56.8	63.9	110	16.0	1
14.3		●	1430S2D	42.9	57.2	64.3	110	16.0	1
14.4		●	1440S2D	43.2	57.6	64.8	110	16.0	1
14.5		●	1450S2D	43.5	58.0	65.2	110	16.0	1

Grade: ACF75

Diameter ø14.6 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
14.6	2	●	MDF 1460S2D	43.8	58.4	66.2	110	16.0	1
14.7		●	1470S2D	44.1	58.8	66.6	110	16.0	1
14.8		●	1480S2D	44.4	59.2	67.1	110	16.0	1
14.9		●	1490S2D	44.7	59.6	67.5	110	16.0	1
15.0		●	1500S2D	45.0	60.0	68.0	110	16.0	1
15.1	2	●	MDF 1510S2D	45.3	60.4	69.0	115	16.0	1
15.2		●	1520S2D	45.6	60.8	69.4	115	16.0	1
15.3		●	1530S2D	45.9	61.2	69.9	115	16.0	1
15.4		●	1540S2D	46.2	61.6	70.3	115	16.0	1
15.5		●	1550S2D	46.5	62.0	70.8	115	16.0	1
15.6		●	1560S2D	46.8	62.4	71.8	115	16.0	1
15.7		●	1570S2D	47.1	62.8	72.2	115	16.0	1
15.8		●	1580S2D	47.4	63.2	72.7	115	16.0	1
15.9		●	1590S2D	47.7	63.6	73.1	115	16.0	1
16.0		●	1600S2D	48.0	64.0	73.6	115	16.0	1
16.5	2	●	MDF 1650S2D	49.5	66.0	72.4	125	18.0	1
17.0		●	1700S2D	51.0	68.0	75.2	125	18.0	1
17.5	2	●	MDF 1750S2D	52.5	70.0	78.0	130	18.0	1
18.0		●	1800S2D	54.0	72.0	80.8	130	18.0	1
18.5	2	●	MDF 1850S2D	55.5	74.0	83.6	140	20.0	1
19.0		●	1900S2D	57.0	76.0	86.4	140	20.0	1
19.5		●	1950S2D	58.5	78.0	89.2	140	20.0	1
20.0		●	2000S2D	60.0	80.0	92.0	140	20.0	1

Grade: ACF75

MDF-S type (External Coolant Supply)

Recommended Cutting Conditions (for 2D)

1. The recommended hole depth is 2 x DC. The depth is measured from the highest point of the work material when drilling in inclined surfaces.
2. The recommended cutting conditions are those for drilling in flat horizontal surfaces.
3. Adjust the feed rate according to the inclination angle when drilling in an inclined surface.
4. Set the feed rate at 70% or lower when the inclination angle is 30° or less.
5. Set the feed rate at 50% or lower when the inclination angle is larger than 30°.
6. This product is a drilling tool. Do not use it for traverse cutting or helical milling.

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel / General Steel (up to 250 HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 50HRC)	Stainless Steel (up to 200HB)	Gray Cast Iron FC250	Ductile Cast Iron FCD450	Aluminum Alloy
ø0.5	n	25,500	22,300	12,700	12,700	25,500	19,000	51,000
	vc	30 - **40** - 50	30 - **35** - 40	15 - **20** - 25	15 - **20** - 25	30 - **40** - 50	20 - **30** - 40	60 - **80** - 100
	f	0.004-**0.005**-0.006	0.004-**0.005**-0.006	0.001-**0.002**-0.003	0.003-**0.004**-0.005	0.004-**0.005**-0.006	0.001-**0.003**-0.005	0.003-**0.005**-0.007
ø1.0	n	17,500	14,300	9,500	8,000	17,500	12,700	32,000
	vc	45 - **55** - 65	35 - **45** - 55	20 - **30** - 40	20 - **25** - 30	45 - **55** - 65	30 - **40** - 50	80 - **100** - 120
	f	0.01 - **0.03** - 0.05	0.01 - **0.03** - 0.05	0.002-**0.006**- 0.01	0.005-**0.007**- 0.01	0.01 - **0.03** - 0.05	0.005- **0.01** -0.015	0.01 - **0.02** - 0.03
ø2.0	n	9,500	8,000	4,800	4,800	9,500	8,800	17,500
	vc	50 - **60** - 70	40 - **50** - 60	20 - **30** - 40	20 - **30** - 40	50 - **60** - 70	45 - **55** - 65	90 - **110** - 130
	f	0.02 - **0.04** - 0.06	0.02 - **0.04** - 0.06	0.01 -**0.018**-0.025	0.01 -**0.015**- 0.02	0.02 - **0.04** - 0.06	0.015- **0.03** -0.045	0.03 - **0.05** - 0.07
ø4.0	n	6,000	5,200	3,400	2,400	6,000	5,200	8,800
	vc	60 - **75** - 90	50 - **65** - 80	20 - **30** - 40	20 - **30** - 40	60 - **75** - 90	55 - **65** - 75	90 - **110** - 130
	f	0.06 - **0.08** - 0.10	0.05 - **0.08** - 0.10	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.06 - **0.08** - 0.10	0.04 - **0.06** - 0.08	0.06 - **0.08** - 0.10
ø6.0	n	4,000	3,400	1,600	1,600	4,000	3,700	5,800
	vc	60 - **75** - 90	50 - **65** - 80	20 - **30** - 40	20 - **30** - 50	60 - **75** - 90	60 - **70** - 80	90 - **110** - 130
	f	0.05 - **0.10** - 0.15	0.05 - **0.10** - 0.15	0.04 - **0.06** - 0.08	0.03 - **0.04** - 0.05	0.05 - **0.10** - 0.15	0.06 - **0.09** - 0.12	0.05 - **0.10** - 0.15
ø8.0	n	3,000	2,600	1,200	1,200	3,000	2,800	4,400
	vc	60 - **75** - 90	50 - **65** - 80	20 - **30** - 40	20 - **30** - 50	60 - **75** - 90	60 - **70** - 80	90 - **110** - 130
	f	0.10 - **0.15** - 0.20	0.10 - **0.15** - 0.20	0.06 - **0.08** - 0.10	0.04 - **0.06** - 0.08	0.10 - **0.15** - 0.20	0.10 - **0.12** - 0.15	0.10 - **0.15** - 0.20
ø10.0	n	2,400	2,100	950	950	2,400	2,200	3,500
	vc	60 - **75** - 90	50 - **65** - 80	20 - **30** - 40	20 - **30** - 50	60 - **75** - 90	60 - **70** - 80	90 - **110** - 130
	f	0.12 - **0.17** - 0.22	0.12 - **0.17** - 0.22	0.08 - **0.10** - 0.12	0.06 - **0.08** - 0.10	0.12 - **0.17** - 0.22	0.12 - **0.15** - 0.18	0.12 - **0.17** - 0.22
ø12.0	n	2,000	1,700	800	800	2,000	1,900	2,900
	vc	60 - **75** - 90	50 - **65** - 80	20 - **30** - 40	20 - **30** - 50	60 - **75** - 90	60 - **70** - 80	90 - **110** - 130
	f	0.15 - **0.20** - 0.25	0.15 - **0.20** - 0.25	0.12 - **0.15** - 0.18	0.08 - **0.10** - 0.12	0.15 - **0.20** - 0.25	0.15 - **0.18** - 0.20	0.15 - **0.20** - 0.25
ø16.0	n	1,500	1,300	600	600	1,500	1,400	2,200
	vc	60 - **75** - 90	50 - **65** - 80	20 - **30** - 40	20 - **30** - 50	60 - **75** - 90	60 - **70** - 80	90 - **110** - 130
	f	0.20 - **0.25** - 0.30	0.20 - **0.25** - 0.30	0.14 - **0.17** - 0.20	0.10 - **0.15** - 0.20	0.17 - **0.22** - 0.27	0.15 - **0.20** - 0.25	0.20 - **0.25** - 0.30
ø20.0	n	1,200	1,000	480	480	1,200	1,100	1,750
	vc	60 - **75** - 90	50 - **65** - 80	20 - **30** - 40	20 - **30** - 50	60 - **75** - 90	60 - **70** - 80	90 - **110** - 130
	f	0.25 - **0.30** - 0.35	0.25 - **0.30** - 0.35	0.16 - **0.19** - 0.22	0.15 - **0.20** - 0.25	0.25 - **0.30** - 0.35	0.20 - **0.25** - 0.30	0.25 - **0.30** - 0.35

* If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available. In this case, the tool life may be shortened.

Min. - **Optimum** - Max.

MEMO

MDF-L type Long Shank (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

PVD Coat | 2D

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (DC ≤ DCON)

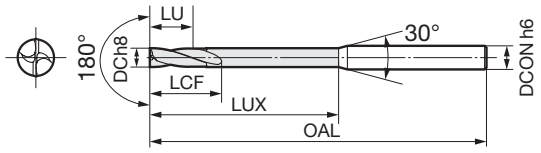
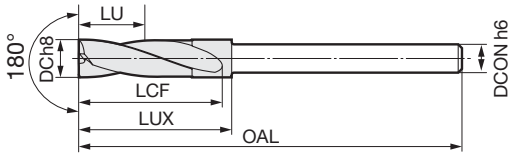


Fig 2 (DC > DCON)



Diameter ø3.0 to 8.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
3.0		●	MDF 0300L2D	9.0	13.5	30.0	100	6.0	1
3.1		●	0310L2D	9.3	14.0	31.0	100	6.0	1
3.2		●	0320L2D	9.6	14.4	32.0	100	6.0	1
3.3		●	0330L2D	9.9	14.9	33.0	100	6.0	1
3.4		●	0340L2D	10.2	15.3	34.0	100	6.0	1
3.5		●	0350L2D	10.5	15.8	35.0	100	6.0	1
3.6		●	0360L2D	10.8	16.2	36.0	100	6.0	1
3.7		●	0370L2D	11.1	16.7	37.0	100	6.0	1
3.8		●	0380L2D	11.4	17.1	38.0	100	6.0	1
3.9		●	0390L2D	11.7	17.6	39.0	100	6.0	1
4.0	2	●	0400L2D	12.0	18.0	40.0	100	6.0	1
4.1		●	0410L2D	12.3	18.5	41.0	100	6.0	1
4.2		●	0420L2D	12.6	18.9	42.0	100	6.0	1
4.3		●	0430L2D	12.9	19.4	43.0	100	6.0	1
4.4		●	0440L2D	13.2	19.8	44.0	100	6.0	1
4.5		●	0450L2D	13.5	20.3	45.0	100	6.0	1
4.6		●	0460L2D	13.8	20.7	46.0	100	6.0	1
4.7		●	0470L2D	14.1	21.2	47.0	100	6.0	1
4.8		●	0480L2D	14.4	21.6	48.0	100	6.0	1
4.9		●	0490L2D	14.7	22.1	49.0	100	6.0	1
5.0		●	0500L2D	15.0	22.5	50.0	100	6.0	1
5.1		●	MDF 0510L2D	15.3	23.0	51.0	110	6.0	1
5.2		●	0520L2D	15.6	23.4	52.0	110	6.0	1
5.3		●	0530L2D	15.9	23.9	53.0	110	6.0	1
5.4		●	0540L2D	16.2	24.3	54.0	110	6.0	1
5.5	2	●	0550L2D	16.5	24.8	55.0	110	6.0	1
5.6		●	0560L2D	16.8	25.2	56.0	110	6.0	1
5.7		●	0570L2D	17.1	25.7	57.0	110	6.0	1
5.8		●	0580L2D	17.4	26.1	58.0	110	6.0	1
5.9		●	0590L2D	17.7	26.6	59.0	110	6.0	1
6.0	2	●	MDF 0600L2D-S5	18.0	27.0	30.0	110	5.0	1
6.0	2	●	MDF 0600L2D	18.0	27.0	60.0	110	6.0	1
6.1		●	MDF 0610L2D	18.3	27.5	30.5	120	6.0	2
6.2		●	0620L2D	18.6	27.9	30.9	120	6.0	2
6.3		●	0630L2D	18.9	28.4	31.4	120	6.0	2
6.4		●	0640L2D	19.2	28.8	31.8	120	6.0	2
6.5	2	●	0650L2D	19.5	29.3	32.3	120	6.0	2
6.6		●	0660L2D	19.8	29.7	32.7	120	6.0	2
6.7		●	0670L2D	20.1	30.2	33.2	120	6.0	2
6.8		●	0680L2D	20.4	30.6	33.6	120	6.0	2
6.9		●	0690L2D	20.7	31.1	34.1	120	6.0	2
7.0		●	0700L2D	21.0	31.5	34.5	120	6.0	2
7.1		●	MDF 0710L2D	21.3	32.0	35.0	130	6.0	2
7.2		●	0720L2D	21.6	32.4	35.4	130	6.0	2
7.3		●	0730L2D	21.9	32.9	35.9	130	6.0	2
7.4		●	0740L2D	22.2	33.3	36.3	130	6.0	2
7.5	2	●	0750L2D	22.5	33.8	36.8	130	6.0	2
7.6		●	0760L2D	22.8	34.2	37.2	130	6.0	2
7.7		●	0770L2D	23.1	34.7	37.7	130	6.0	2
7.8		●	0780L2D	23.4	35.1	38.1	130	6.0	2
7.9		●	0790L2D	23.7	35.6	38.6	130	6.0	2
8.0		●	0800L2D-S6	24.0	36.0	39.0	130	6.0	2
8.0	2	●	MDF 0800L2D	24.0	36.0	80.0	130	8.0	1
8.1		●	MDF 0810L2D	24.3	36.5	39.5	140	8.0	2
8.2		●	0820L2D	24.6	36.9	39.9	140	8.0	2
8.3	2	●	0830L2D	24.9	37.4	40.4	140	8.0	2
8.4		●	0840L2D	25.2	37.8	40.8	140	8.0	2
8.5		●	0850L2D	25.5	38.3	41.3	140	8.0	2

Grade: ACF75

Diameter ø8.6 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
8.6		●	MDF 0860L2D	25.8	38.7	41.7	140	8.0	2
8.7		●	0870L2D	26.1	39.2	42.2	140	8.0	2
8.8	2	●	0880L2D	26.4	39.6	42.6	140	8.0	2
8.9		●	0890L2D	26.7	40.1	43.1	140	8.0	2
9.0		●	0900L2D	27.0	40.5	43.5	140	8.0	2
9.1		●	MDF 0910L2D	27.3	41.0	44.0	150	8.0	2
9.2		●	0920L2D	27.6	41.4	44.4	150	8.0	2
9.3		●	0930L2D	27.9	41.9	44.9	150	8.0	2
9.4		●	0940L2D	28.2	42.3	45.3	150	8.0	2
9.5	2	●	0950L2D	28.5	42.8	45.8	150	8.0	2
9.6		●	0960L2D	28.8	43.2	46.2	150	8.0	2
9.7		●	0970L2D	29.1	43.7	46.7	150	8.0	2
9.8		●	0980L2D	29.4	44.1	47.1	150	8.0	2
9.9		●	0990L2D	29.7	44.6	47.6	150	8.0	2
10.0		●	1000L2D-S8	30.0	45.0	48.0	150	8.0	2
10.0	2	●	MDF 1000L2D	30.0	45.0	100.0	150	10.0	1
10.1		●	MDF 1010L2D	30.3	45.5	48.5	160	10.0	2
10.2		●	1020L2D	30.6	45.9	48.9	160	10.0	2
10.3		●	1030L2D	30.9	46.4	49.4	160	10.0	2
10.4		●	1040L2D	31.2	46.8	49.8	160	10.0	2
10.5	2	●	1050L2D	31.5	47.3	50.3	160	10.0	2
10.6		●	1060L2D	31.8	47.7	50.7	160	10.0	2
10.7		●	1070L2D	32.1	48.2	51.2	160	10.0	2
10.8		●	1080L2D	32.4	48.6	51.6	160	10.0	2
10.9		●	1090L2D	32.7	49.1	52.1	160	10.0	2
11.0		●	1100L2D	33.0	49.5	52.5	160	10.0	2
11.1		●	MDF 1110L2D	33.3	50.0	53.0	170	10.0	2
11.2		●	1120L2D	33.6	50.4	53.4	160	10.0	2
11.3		●	1130L2D	33.9	50.9	53.9	160	10.0	2
11.4		●	1140L2D	34.2	51.3	54.3	160	10.0	2
11.5	2	●	1150L2D	34.5	51.8	54.8	160	10.0	2
11.6		●	1160L2D	34.8	52.2	55.2	160	10.0	2
11.7		●	1170L2D	35.1	52.7	55.7	160	10.0	2
11.8		●	1180L2D	35.4	53.1	56.1	160	10.0	2
11.9		●	1190L2D	35.7	53.6	56.6	160	10.0	2
12.0		●	1200L2D-S10	36.0	54.0	57.0	160	10.0	2
12.0	2	●	MDF 1200L2D	36.0	54.0	120.0	170	12.0	1
12.5	2	●	MDF 1250L2D	37.5	56.3	59.3	180	12.0	2
13.0		●	1300L2D	39.0	58.5	61.5	180	12.0	2
13.5	2	●	MDF 1350L2D	40.5	60.8	63.8	190	12.0	2
14.0		●	1400L2D-S12	42.0	63.0	66.0	190	12.0	2
14.0	2	●	MDF 1400L2D	42.0	63.0	140.0	190	14.0	2
14.5	2	●	MDF 1450L2D	43.5	65.3	68.3	200	14.0	2
15.0		●	1500L2D	45.0	67.5	70.5	200	14.0	2
15.5	2	●	MDF 1550L2D	46.5	69.8	72.8	210	14.0	2
16.0		●	1600L2D-S14	48.0	72.0	75.0	210	14.0	2
16.0	2	●	MDF 1600L2D	48.0	72.0	160.0	210	16.0	1
16.5	2	●	MDF 1650L2D	49.5	74.3	77.3	220	16.0	2
17.0		●	1700L2D	51.0	76.5	79.5	220	16.0	2
17.5	2	●	MDF 1750L2D	52.5	78.8	81.8	230	16.0	2
18.0		●	1800L2D-S16	54.0	81.0	84.0	230	16.0	2
18.0	2	●	MDF 1800L2D	54.0	81.0	180.0	230	18.0	1
18.5	2	●	MDF 1850L2D	55.5	83.3	86.3	240	18.0	2
19.0		●	1900L2D	57.0	85.5	88.5	240	18.0	2
19.5	2	●	MDF 1950L2D	58.5	87.8	90.8	250	18.0	2
20.0		●	2000L2D-S18	60.0	90.0	93.0	250	18.0	2
20.0	2	●	MDF 2000L2D	60.0	90.0	200.0	250	20.0	1

Grade: ACF75

A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed.

MDF-L type Long Shank (External Coolant Supply)

Recommended Cutting Conditions (for 2D)

1. A prepared hole with the same diameter is needed for drilling with this tool.
2. The cutting conditions are recommended when there is a prepared hole with the same diameter.
3. The recommended hole depth is 5 x DC. The depth is measured from the highest point of the work material when drilling in inclined surfaces.
4. This product is a drilling tool. Do not use it for traverse cutting or helical milling.

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel / General Steel (up to 250 HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 50HRC)	Stainless Steel (up to 200HB)	Gray Cast Iron FC250	Ductile Cast Iron FCD450	Aluminum Alloy
ø4.0	n	6,400	5,600	3,400	2,400	6,800	6,000	8,800
	vc	60 - **80** - 100	50 - **70** - 90	20 - **30** - 40	20 - **30** - 40	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.06 - **0.08** - 0.10	0.05 - **0.08** - 0.10	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.06 - **0.08** - 0.10	0.04 - **0.06** - 0.08	0.06 - **0.08** - 0.10
ø6.0	n	4,200	3,700	1,600	1,600	4,500	4,000	5,800
	vc	60 - **80** - 100	50 - **70** - 90	20 - **30** - 40	20 - **30** - 50	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.05 - **0.10** - 0.15	0.05 - **0.10** - 0.15	0.04 - **0.06** - 0.08	0.03 - **0.04** - 0.05	0.05 - **0.10** - 0.15	0.06 - **0.09** - 0.12	0.05 - **0.10** - 0.15
ø8.0	n	3,200	2,800	1,200	1,200	3,400	3,000	4,400
	vc	60 - **80** - 100	50 - **70** - 90	20 - **30** - 40	20 - **30** - 50	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.10 - **0.15** - 0.20	0.10 - **0.15** - 0.20	0.06 - **0.08** - 0.10	0.04 - **0.06** - 0.08	0.10 - **0.15** - 0.20	0.10 - **0.12** - 0.15	0.10 - **0.15** - 0.20
ø10.0	n	2,500	2,200	950	950	2,700	2,400	3,500
	vc	60 - **80** - 100	50 - **70** - 90	20 - **30** - 40	20 - **30** - 50	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.15 - **0.20** - 0.25	0.15 - **0.20** - 0.25	0.08 - **0.10** - 0.12	0.06 - **0.08** - 0.10	0.15 - **0.20** - 0.25	0.12 - **0.15** - 0.18	0.15 - **0.20** - 0.25
ø12.0	n	2,100	1,900	800	800	2,300	2,000	2,900
	vc	60 - **80** - 100	50 - **70** - 90	20 - **30** - 40	20 - **30** - 50	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.20 - **0.25** - 0.30	0.20 - **0.25** - 0.30	0.12 - **0.15** - 0.18	0.08 - **0.10** - 0.12	0.17 - **0.22** - 0.27	0.15 - **0.20** - 0.25	0.20 - **0.25** - 0.30
ø16.0	n	1,600	1,400	600	600	1,700	1,500	2,200
	vc	60 - **80** - 100	50 - **70** - 90	20 - **30** - 40	20 - **30** - 50	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.20 - **0.25** - 0.30	0.20 - **0.25** - 0.30	0.14 - **0.17** - 0.20	0.10 - **0.15** - 0.20	0.20 - **0.25** - 0.30	0.20 - **0.25** - 0.30	0.25 - **0.30** - 0.35
ø20.0	n	1,300	1,100	480	480	1,300	1,200	1,750
	vc	60 - **80** - 100	50 - **70** - 90	20 - **30** - 40	20 - **30** - 50	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.25 - **0.30** - 0.35	0.25 - **0.30** - 0.35	0.16 - **0.19** - 0.22	0.15 - **0.20** - 0.25	0.30 - **0.35** - 0.40	0.25 - **0.30** - 0.35	0.35 - **0.40** - 0.45

Min. - **Optimum** - Max.

MDF-H type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

PVD Coat | 3D | 5D

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (3D single margin)

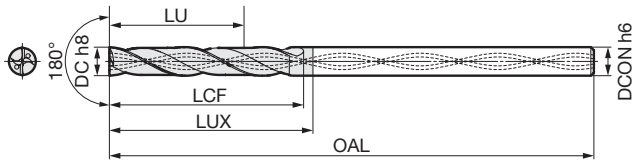
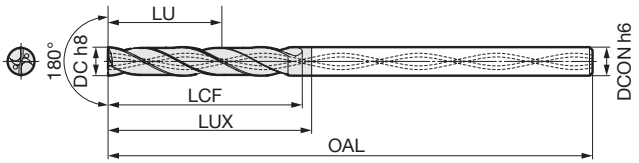


Fig 2 (5D double margin)



Diameter ø3.0 to 5.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
3.0	3	●	MDF 0300H3D	12.0	13.5	16.5	68	3.0	1
	5	●	0300H5D	18.0	20.1	23.1	78	3.0	2
3.1	3	●	MDF 0310H3D	12.4	14.0	17.0	72	4.0	1
	5	●	0310H5D	18.6	20.8	23.8	86	4.0	2
3.2	3	●	MDF 0320H3D	12.8	14.4	17.4	72	4.0	1
	5	●	0320H5D	19.2	21.4	24.4	86	4.0	2
3.3	3	●	MDF 0330H3D	13.2	14.9	17.9	72	4.0	1
	5	●	0330H5D	19.8	22.1	25.1	86	4.0	2
3.4	3	●	MDF 0340H3D	13.6	15.3	18.3	72	4.0	1
	5	●	0340H5D	20.4	22.8	25.8	86	4.0	2
3.5	3	●	MDF 0350H3D	14.0	15.8	18.8	72	4.0	1
	5	●	0350H5D	21.0	23.5	26.5	86	4.0	2
3.6	3	●	MDF 0360H3D	14.4	16.2	19.2	72	4.0	1
	5	●	0360H5D	21.6	24.1	27.1	86	4.0	2
3.7	3	●	MDF 0370H3D	14.8	16.7	19.7	72	4.0	1
	5	●	0370H5D	22.2	24.8	27.8	86	4.0	2
3.8	3	●	MDF 0380H3D	15.2	17.1	20.1	72	4.0	1
	5	●	0380H5D	22.8	25.5	28.5	86	4.0	2
3.9	3	●	MDF 0390H3D	15.6	17.6	20.6	72	4.0	1
	5	●	0390H5D	23.4	26.1	29.1	86	4.0	2
4.0	3	●	MDF 0400H3D	16.0	18.0	21.0	72	4.0	1
	5	●	0400H5D	24.0	26.8	29.8	86	4.0	2
4.1	3	●	MDF 0410H3D	16.4	18.5	21.5	80	5.0	1
	5	●	0410H5D	24.6	27.5	30.5	98	5.0	2
4.2	3	●	MDF 0420H3D	16.8	18.9	21.9	80	5.0	1
	5	●	0420H5D	25.2	28.1	31.1	98	5.0	2
4.3	3	●	MDF 0430H3D	17.2	19.4	22.4	80	5.0	1
	5	●	0430H5D	25.8	28.8	31.8	98	5.0	2
4.4	3	●	MDF 0440H3D	17.6	19.8	22.8	80	5.0	1
	5	●	0440H5D	26.4	29.5	32.5	98	5.0	2
4.5	3	●	MDF 0450H3D	18.0	20.3	23.3	80	5.0	1
	5	●	0450H5D	27.0	30.2	33.2	98	5.0	2
4.6	3	●	MDF 0460H3D	18.4	20.7	23.7	80	5.0	1
	5	●	0460H5D	27.6	30.8	33.8	98	5.0	2
4.7	3	●	MDF 0470H3D	18.8	21.2	24.2	80	5.0	1
	5	●	0470H5D	28.2	31.5	34.5	98	5.0	2
4.8	3	●	MDF 0480H3D	19.2	21.6	24.6	80	5.0	1
	5	●	0480H5D	28.8	32.2	35.2	98	5.0	2
4.9	3	●	MDF 0490H3D	19.6	22.1	25.1	80	5.0	1
	5	●	0490H5D	29.4	32.8	35.8	98	5.0	2
5.0	3	●	MDF 0500H3D	20.0	22.5	25.5	80	5.0	1
	5	●	0500H5D	30.0	33.5	36.5	98	5.0	2
5.1	3	●	MDF 0510H3D	20.4	23.0	26.0	82	6.0	1
	5	●	0510H5D	30.6	34.2	37.2	100	6.0	2
5.2	3	●	MDF 0520H3D	20.8	23.4	26.4	82	6.0	1
	5	●	0520H5D	31.2	34.8	37.8	100	6.0	2
5.3	3	●	MDF 0530H3D	21.2	23.9	26.9	82	6.0	1
	5	●	0530H5D	31.8	35.5	38.5	100	6.0	2
5.4	3	●	MDF 0540H3D	21.6	24.3	27.3	82	6.0	1
	5	●	0540H5D	32.4	36.2	39.2	100	6.0	2
5.5	3	●	MDF 0550H3D	22.0	24.8	27.8	82	6.0	1
	5	●	0550H5D	33.0	36.9	39.9	100	6.0	2
5.6	3	●	MDF 0560H3D	22.4	25.2	28.2	82	6.0	1
	5	●	0560H5D	33.6	37.5	40.5	100	6.0	2
5.7	3	●	MDF 0570H3D	22.8	25.7	28.7	82	6.0	1
	5	●	0570H5D	34.2	38.2	41.2	100	6.0	2

Grade: ACF75

Diameter ø5.8 to 8.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
5.8	3	●	MDF 0580H3D	23.2	26.1	29.1	82	6.0	1
	5	●	0580H5D	34.8	38.9	41.9	100	6.0	2
5.9	3	●	MDF 0590H3D	23.6	26.6	29.6	82	6.0	1
	5	●	0590H5D	35.4	39.5	42.5	100	6.0	2
6.0	3	●	MDF 0600H3D	24.0	27.0	30.0	82	6.0	1
	5	●	0600H5D	36.0	40.2	43.2	100	6.0	2
6.1	3	●	MDF 0610H3D	24.4	27.5	30.5	88	7.0	1
	5	●	0610H5D	36.6	40.9	43.9	109	7.0	2
6.2	3	●	MDF 0620H3D	24.8	27.9	30.9	88	7.0	1
	5	●	0620H5D	37.2	41.5	44.5	109	7.0	2
6.3	3	●	MDF 0630H3D	25.2	28.4	31.4	88	7.0	1
	5	●	0630H5D	37.8	42.2	45.2	109	7.0	2
6.4	3	●	MDF 0640H3D	25.6	28.8	31.8	88	7.0	1
	5	●	0640H5D	38.4	42.9	45.9	109	7.0	2
6.5	3	●	MDF 0650H3D	26.0	29.3	32.3	88	7.0	1
	5	●	0650H5D	39.0	43.6	46.6	109	7.0	2
6.6	3	●	MDF 0660H3D	26.4	29.7	32.7	88	7.0	1
	5	●	0660H5D	39.6	44.2	47.2	109	7.0	2
6.7	3	●	MDF 0670H3D	26.8	30.2	33.2	88	7.0	1
	5	●	0670H5D	40.2	44.9	47.9	109	7.0	2
6.8	3	●	MDF 0680H3D	27.2	30.6	33.6	88	7.0	1
	5	●	0680H5D	40.8	45.6	48.6	109	7.0	2
6.9	3	●	MDF 0690H3D	27.6	31.1	34.1	88	7.0	1
	5	●	0690H5D	41.4	46.2	49.2	109	7.0	2
7.0	3	●	MDF 0700H3D	28.0	31.5	34.5	88	7.0	1
	5	●	0700H5D	42.0	46.9	49.9	109	7.0	2
7.1	3	●	MDF 0710H3D	28.4	32.0	35.0	94	8.0	1
	5	●	0710H5D	42.6	47.6	50.6	118	8.0	2
7.2	3	●	MDF 0720H3D	28.8	32.4	35.4	94	8.0	1
	5	●	0720H5D	43.2	48.2	51.2	118	8.0	2
7.3	3	●	MDF 0730H3D	29.2	32.9	35.9	94	8.0	1
	5	●	0730H5D	43.8	48.9	51.9	118	8.0	2
7.4	3	●	MDF 0740H3D	29.6	33.3	36.3	94	8.0	1
	5	●	0740H5D	44.4	49.6	52.6	118	8.0	2
7.5	3	●	MDF 0750H3D	30.0	33.8	36.8	94	8.0	1
	5	●	0750H5D	45.0	50.3	53.3	118	8.0	2
7.6	3	●	MDF 0760H3D	30.4	34.2	37.2	94	8.0	1
	5	●	0760H5D	45.6	50.9	53.9	118	8.0	2
7.7	3	●	MDF 0770H3D	30.8	34.7	37.7	94	8.0	1
	5	●	0770H5D	46.2	51.6	54.6	118	8.0	2
7.8	3	●	MDF 0780H3D	31.2	35.1	38.1	94	8.0	1
	5	●	0780H5D	46.8	52.3	55.3	118	8.0	2
7.9	3	●	MDF 0790H3D	31.6	35.6	38.6	94	8.0	1
	5	●	0790H5D	47.4	52.9	55.9	118	8.0	2
8.0	3	●	MDF 0800H3D	32.0	36.0	39.0	94	8.0	1
	5	●	0800H5D	48.0	53.6	56.6	118	8.0	2
8.1	3	●	MDF 0810H3D	32.4	36.5	39.5	100	9.0	1
	5	●	0810H5D	48.6	54.3	57.3	127	9.0	2
8.2	3	●	MDF 0820H3D	32.8	36.9	39.9	100	9.0	1
	5	●	0820H5D	49.2	54.9	57.9	127	9.0	2
8.3	3	●	MDF 0830H3D	33.2	37.4	40.4	100	9.0	1
	5	●	0830H5D	49.8	55.6	58.6	127	9.0	2
8.4	3	●	MDF 0840H3D	33.6	37.8	40.8	100	9.0	1
	5	●	0840H5D	50.4	56.3	59.3	127	9.0	2
8.5	3	●	MDF 0850H3D	34.0	38.3	41.3	100	9.0	1
	5	●	0850H5D	51.0	57.0	60.0	127	9.0	2

Grade: ACF75

*A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed.

MDF-H type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

PVD Coat | 3D | 5D

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (3D single margin)

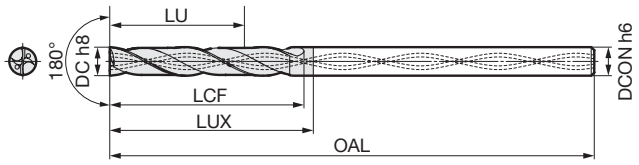
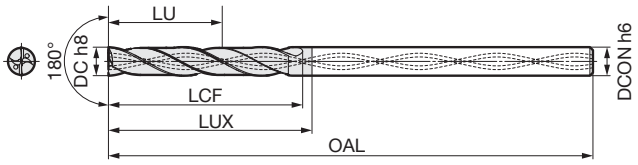


Fig 2 (5D double margin)



Diameter ø8.6 to 11.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
8.6	3	●	MDF 0860H3D	34.4	38.7	41.7	100	9.0	1
	5	●	0860H5D	51.6	57.6	60.6	127	9.0	2
8.7	3	●	MDF 0870H3D	34.8	39.2	42.2	100	9.0	1
	5	●	0870H5D	52.2	58.3	61.3	127	9.0	2
8.8	3	●	MDF 0880H3D	35.2	39.6	42.6	100	9.0	1
	5	●	0880H5D	52.8	59.0	62.0	127	9.0	2
8.9	3	●	MDF 0890H3D	35.6	40.1	43.1	100	9.0	1
	5	●	0890H5D	53.4	59.6	62.6	127	9.0	2
9.0	3	●	MDF 0900H3D	36.0	40.5	43.5	100	9.0	1
	5	●	0900H5D	54.0	60.3	63.3	127	9.0	2
9.1	3	●	MDF 0910H3D	36.4	41.0	44.0	106	10.0	1
	5	●	0910H5D	54.6	61.0	64.0	136	10.0	2
9.2	3	●	MDF 0920H3D	36.8	41.4	44.4	106	10.0	1
	5	●	0920H5D	55.2	61.6	64.6	136	10.0	2
9.3	3	●	MDF 0930H3D	37.2	41.9	44.9	106	10.0	1
	5	●	0930H5D	55.8	62.3	65.3	136	10.0	2
9.4	3	●	MDF 0940H3D	37.6	42.3	45.3	106	10.0	1
	5	●	0940H5D	56.4	63.0	66.0	136	10.0	2
9.5	3	●	MDF 0950H3D	38.0	42.8	45.8	106	10.0	1
	5	●	0950H5D	57.0	63.7	66.7	136	10.0	2
9.6	3	●	MDF 0960H3D	38.4	43.2	46.2	106	10.0	1
	5	●	0960H5D	57.6	64.3	67.3	136	10.0	2
9.7	3	●	MDF 0970H3D	38.8	43.7	46.7	106	10.0	1
	5	●	0970H5D	58.2	65.0	68.0	136	10.0	2
9.8	3	●	MDF 0980H3D	39.2	44.1	47.1	106	10.0	1
	5	●	0980H5D	58.8	65.7	68.7	136	10.0	2
9.9	3	●	MDF 0990H3D	39.6	44.6	47.6	106	10.0	1
	5	●	0990H5D	59.4	66.3	69.3	136	10.0	2
10.0	3	●	MDF 1000H3D	40.0	45.0	48.0	106	10.0	1
	5	●	1000H5D	60.0	67.0	70.0	136	10.0	2
10.1	3	●	MDF 1010H3D	40.4	45.5	48.5	116	11.0	1
	5	●	1010H5D	60.6	67.7	70.7	149	11.0	2
10.2	3	●	MDF 1020H3D	40.8	45.9	48.9	116	11.0	1
	5	●	1020H5D	61.2	68.3	71.3	149	11.0	2
10.3	3	●	MDF 1030H3D	41.2	46.4	49.4	116	11.0	1
	5	●	1030H5D	61.8	69.0	72.0	149	11.0	2
10.4	3	●	MDF 1040H3D	41.6	46.8	49.8	116	11.0	1
	5	●	1040H5D	62.4	69.7	72.7	149	11.0	2
10.5	3	●	MDF 1050H3D	42.0	47.3	50.3	116	11.0	1
	5	●	1050H5D	63.0	70.4	73.4	149	11.0	2
10.6	3	●	MDF 1060H3D	42.4	47.7	50.7	116	11.0	1
	5	●	1060H5D	63.6	71.0	74.0	149	11.0	2
10.7	3	●	MDF 1070H3D	42.8	48.2	51.2	116	11.0	1
	5	●	1070H5D	64.2	71.7	74.7	149	11.0	2
10.8	3	●	MDF 1080H3D	43.2	48.6	51.6	116	11.0	1
	5	●	1080H5D	64.8	72.4	75.4	149	11.0	2
10.9	3	●	MDF 1090H3D	43.6	49.1	52.1	116	11.0	1
	5	●	1090H5D	65.4	73.0	76.0	149	11.0	2
11.0	3	●	MDF 1100H3D	44.0	49.5	52.5	116	11.0	1
	5	●	1100H5D	66.0	73.7	76.7	149	11.0	2
11.1	3	●	MDF 1110H3D	44.4	50.0	53.0	122	12.0	1
	5	●	1110H5D	66.6	74.4	77.4	158	12.0	2
11.2	3	●	MDF 1120H3D	44.8	50.4	53.4	122	12.0	1
	5	●	1120H5D	67.2	75.0	78.0	158	12.0	2
11.3	3	●	MDF 1130H3D	45.2	50.9	53.9	122	12.0	1
	5	●	1130H5D	67.8	75.7	78.7	158	12.0	2

Grade: ACF75

Diameter ø11.4 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Neck Length LUX	Overall Length OAL	Shank Dia. DCON	Fig
11.4	3	●	MDF 1140H3D	45.6	51.3	54.3	122	12.0	1
	5	●	1140H5D	68.4	76.4	79.4	158	12.0	2
11.5	3	●	MDF 1150H3D	46.0	51.8	54.8	122	12.0	1
	5	●	1150H5D	69.0	77.1	80.1	158	12.0	2
11.6	3	●	MDF 1160H3D	46.4	52.2	55.2	122	12.0	1
	5	●	1160H5D	69.6	77.7	80.7	158	12.0	2
11.7	3	●	MDF 1170H3D	46.8	52.7	55.7	122	12.0	1
	5	●	1170H5D	70.2	78.4	81.4	158	12.0	2
11.8	3	●	MDF 1180H3D	47.2	53.1	56.1	122	12.0	1
	5	●	1180H5D	70.8	79.1	82.1	158	12.0	2
11.9	3	●	MDF 1190H3D	47.6	53.6	56.6	122	12.0	1
	5	●	1190H5D	71.4	79.7	82.7	158	12.0	2
12.0	3	●	MDF 1200H3D	48.0	54.0	57.0	122	12.0	1
	5	●	1200H5D	72.0	80.4	83.4	158	12.0	2
12.5	3	●	MDF 1250H3D	50.0	56.3	59.3	128	13.0	1
	5	●	1250H5D	75.0	83.8	86.8	167	13.0	2
13.0	3	●	MDF 1300H3D	52.0	58.5	61.5	128	13.0	1
	5	●	1300H5D	78.0	87.1	90.1	167	13.0	2
13.5	3	●	MDF 1350H3D	54.0	60.8	63.8	134	14.0	1
	5	●	1350H5D	81.0	90.5	93.5	176	14.0	2
14.0	3	●	MDF 1400H3D	56.0	63.0	66.0	134	14.0	1
	5	●	1400H5D	84.0	93.8	96.8	176	14.0	2
14.5	3	●	MDF 1450H3D	58.0	65.3	68.3	140	15.0	1
	5	●	1450H5D	87.0	97.2	100.2	185	15.0	2
15.0	3	●	MDF 1500H3D	60.0	67.5	70.5	140	15.0	1
	5	●	1500H5D	90.0	100.5	103.5	185	15.0	2
15.5	3	●	MDF 1550H3D	62.0	69.8	72.8	146	16.0	1
	5	●	1550H5D	93.0	103.9	106.9	194	16.0	2
16.0	3	●	MDF 1600H3D	64.0	72.0	75.0	146	16.0	1
	5	●	1600H5D	96.0	107.2	110.2	194	16.0	2

Grade: ACF75

*A prepared hole with the same diameter or centring hole with a larger diameter than the tool is needed.

MDF-H type (Internal Coolant Supply)

Recommended Cutting Conditions (for 3D)

1. The recommended hole depth is 3 x DC. The depth is measured from the highest point of the work material when drilling in inclined surfaces.
2. The recommended cutting conditions are those for drilling in flat horizontal surfaces.
3. Adjust the feed rate according to the inclination angle when drilling in an inclined surface.
4. Set the feed rate at 70% or lower when the inclination angle is 30° or less.
5. Set the feed rate at 50% or lower when the inclination angle is larger than 30°.
6. This product is a drilling tool. Do not use it for traverse cutting or helical milling.
7. A prepared hole with the same diameter is recommended for drilling of stainless steel.

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel / General Steel (up to 250 HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 50HRC)	Stainless Steel (up to 200HB)	Gray Cast Iron FC250	Ductile Cast Iron FCD450	Aluminum Alloy
ø4.0	n	6,800	5,600	3,200	2,800	6,800	6,000	9,500
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.06 - **0.08** - 0.10	0.05 - **0.08** - 0.10	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.06 - **0.08** - 0.10	0.04 - **0.06** - 0.08	0.06 - **0.08** - 0.10
ø6.0	n	4,500	3,700	2,100	1,900	4,500	4,200	6,400
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	70 - **80** - 90	90 - **120** - 150
	f	0.05 - **0.10** - 0.15	0.05 - **0.10** - 0.15	0.04 - **0.06** - 0.08	0.03 - **0.04** - 0.05	0.05 - **0.10** - 0.15	0.06 - **0.09** - 0.12	0.05 - **0.10** - 0.15
ø8.0	n	3,400	2,800	1,600	1,400	3,400	3,200	4,800
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	70 - **80** - 90	90 - **120** - 150
	f	0.10 - **0.15** - 0.20	0.10 - **0.15** - 0.20	0.06 - **0.08** - 0.10	0.04 - **0.06** - 0.08	0.10 - **0.15** - 0.20	0.10 - **0.12** - 0.15	0.10 - **0.15** - 0.20
ø10.0	n	2,700	2,200	1,300	1,100	2,700	2,500	3,800
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	70 - **80** - 90	90 - **120** - 150
	f	0.12 - **0.17** - 0.22	0.12 - **0.17** - 0.22	0.08 - **0.10** - 0.12	0.06 - **0.08** - 0.10	0.12 - **0.17** - 0.22	0.12 - **0.15** - 0.18	0.15 - **0.20** - 0.25
ø12.0	n	2,300	1,900	1,100	900	2,300	2,100	3,200
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	70 - **80** - 90	90 - **120** - 150
	f	0.15 - **0.20** - 0.25	0.15 - **0.20** - 0.25	0.12 - **0.15** - 0.18	0.08 - **0.10** - 0.12	0.15 - **0.20** - 0.25	0.15 - **0.18** - 0.20	0.20 - **0.25** - 0.30
ø16.0	n	1,700	1,400	600	700	1,700	1,600	2,400
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	70 - **80** - 90	90 - **120** - 150
	f	0.15 - **0.20** - 0.25	0.15 - **0.20** - 0.25	0.12 - **0.15** - 0.18	0.10 - **0.15** - 0.20	0.17 - **0.22** - 0.27	0.15 - **0.20** - 0.25	0.25 - **0.30** - 0.40

Min. - **Optimum** - Max.

Recommended Cutting Conditions (for 5D)

1. A prepared hole with the same diameter is needed for drilling with this tool.
2. The cutting conditions are recommended when there is a prepared hole with the same diameter.
3. The recommended hole depth is 5 x DC. The depth is measured from the highest point of the work material when drilling in inclined surfaces.
4. This product is a drilling tool. Do not use it for traverse cutting or helical milling.

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel / General Steel (up to 250 HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 50HRC)	Stainless Steel (up to 200HB)	Gray Cast Iron FC250	Ductile Cast Iron FCD450	Aluminum Alloy
ø4.0	n	6,800	5,600	3,200	2,800	6,800	6,000	9,500
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.06 - **0.08** - 0.10	0.05 - **0.08** - 0.10	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.06 - **0.08** - 0.10	0.04 - **0.06** - 0.08	0.06 - **0.08** - 0.10
ø6.0	n	4,500	3,700	2,100	1,900	4,500	4,000	6,400
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.05 - **0.10** - 0.15	0.05 - **0.10** - 0.15	0.04 - **0.06** - 0.08	0.03 - **0.04** - 0.05	0.05 - **0.10** - 0.15	0.06 - **0.09** - 0.12	0.05 - **0.10** - 0.15
ø8.0	n	3,400	2,800	1,600	1,400	3,400	3,000	4,800
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.10 - **0.15** - 0.20	0.10 - **0.15** - 0.20	0.06 - **0.08** - 0.10	0.04 - **0.06** - 0.08	0.10 - **0.15** - 0.20	0.10 - **0.12** - 0.15	0.10 - **0.15** - 0.20
ø10.0	n	2,700	2,200	1,300	1,100	2,700	2,400	3,800
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.15 - **0.20** - 0.25	0.15 - **0.20** - 0.25	0.08 - **0.10** - 0.12	0.06 - **0.08** - 0.10	0.15 - **0.20** - 0.25	0.12 - **0.15** - 0.18	0.15 - **0.20** - 0.25
ø12.0	n	2,300	1,900	1,100	900	2,300	2,000	3,200
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.20 - **0.25** - 0.30	0.20 - **0.25** - 0.30	0.12 - **0.15** - 0.18	0.08 - **0.10** - 0.12	0.17 - **0.22** - 0.27	0.15 - **0.20** - 0.25	0.20 - **0.25** - 0.30
ø16.0	n	1,700	1,400	600	700	1,700	1,500	2,400
	vc	70 - **85** - 100	60 - **75** - 90	30 - **40** - 50	25 - **35** - 45	70 - **85** - 100	65 - **75** - 85	90 - **120** - 150
	f	0.20 - **0.25** - 0.30	0.20 - **0.25** - 0.30	0.14 - **0.17** - 0.20	0.10 - **0.15** - 0.20	0.20 - **0.25** - 0.30	0.20 - **0.25** - 0.30	0.25 - **0.30** - 0.35

Min. - **Optimum** - Max.

MEMO

GS/HGS series

■ General Features

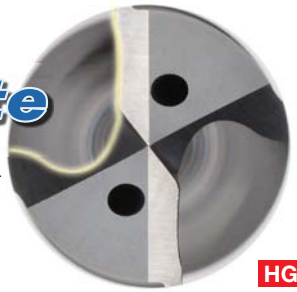
Super MULTIDRILL GS and HGS series are solid carbide drills that employs a proprietary J-flute design and wide chip pockets to achieve excellent chip control and evacuation.
In addition, DEX Coat enables long and stable tool life over a wide application range, for a variety of work materials.

■ Features and Applications

- **Long tool life**
  J-flute and special DEX Coat provide long tool life for a wide variety of work materials.
- **Stable chip evacuation**
  J-flute shape significantly improves chip control and evacuation.
- **Quiet drilling and stable drilling force**
  Stable drilling with minimal drill deflection even in small machine applications.
- **Environmentally friendly**
  Also compatible with the MQL (Minimum Quantity Lubrication) system.

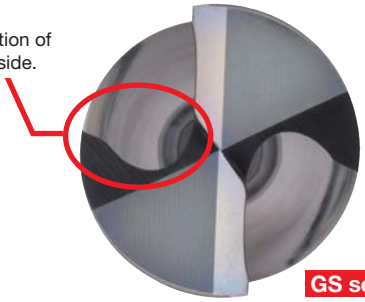
J flute

*"J flute" is a registered trademark.



HGS series

Wide chip pocket for smooth evacuation of chips generated inside.



GS series

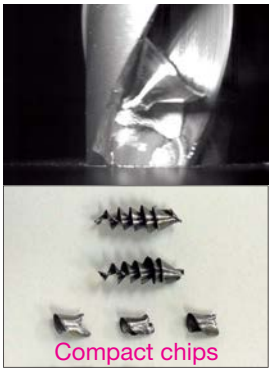
■ Product Range

Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)
External (GS series)	MDW□□□□GS2	ø1.0 to ø20.0	up to 2
	MDW□□□□GS4		up to 4
Internal (HGS series)	MDW□□□□HGS3	ø1.5 to ø20.0	up to 3
	MDW□□□□HGS5		up to 5
	MDW□□□□HGS8	ø1.5 to ø16.0	up to 8

■ Performance

Chip Control

GS series



Compact chips

Conventional Tool

Comparison of Cutting Force

GS series Conventional Tool

GS series provides stable drill behaviour throughout the drilling process

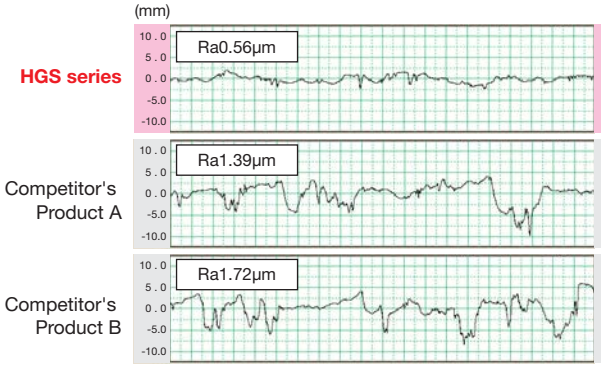
Tool : MDW 0800GS4
Work Material : S50C (200HB)
Cutting Conditions : vc = 80m/min, f = 0.25mm/rev, H = 24mm,
External Coolant Supply (water soluble)

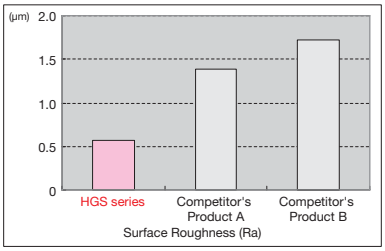
GS/HGS series

■ Uses Double Margin (HGS series) (excluding ø1.5 to ø2.4mm sizes)

The HGS series uses a double margin for greater stability and hole precision in deep hole drilling

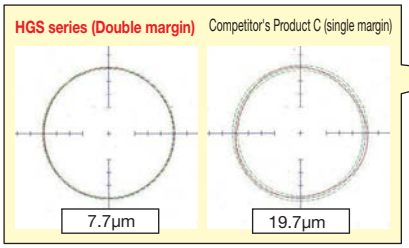
● Surface Roughness Comparison

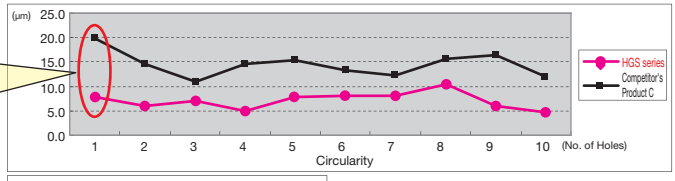




Work Material : SCM415 (120HB)
Tool : MDW0800HGS5
Cutting Conditions : vc = 80m/min, f = 0.25mm/rev, H = 38mm
Internal Coolant Supply (water soluble)

● Circularity Comparison



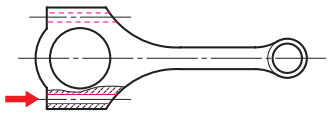


Work Material : S50C (200HB)
Tool : MDW 0800HGS8
Cutting Conditions : vc = 80m/min, f = 0.25mm/rev
H=64mm, internal coolant supply (water soluble)

4-point guide design thanks to double margin reduces runout for improved stability. Good surface roughness and circularity.

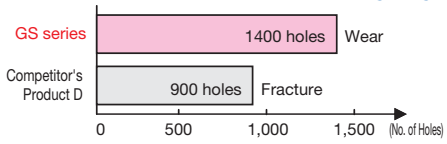
■ Application Examples (Super MULTIDRILL GS series)

● S43C (250HB) Automotive Component

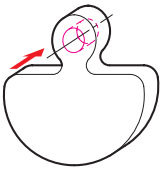


· Tool : MDW 0970GS4
· Cutting Conditions : vc = 80m/min, f = 0.25mm/rev
H = 25mm, External Coolant Supply (water soluble)

Achieves 1.5 times longer tool life!
Reduces wear on peripheral cutting edge

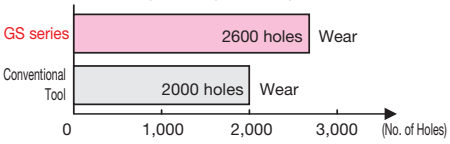


● Boron Steel (30HRC) Machine Component

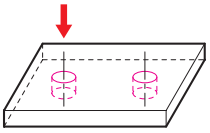


· Tool : MDW 0980GS2
· Cutting Conditions : vc = 70m/min, f = 0.15mm/rev
H=7mm, external coolant supply (water soluble)

1.3 times longer tool life than conventional drills
Good circularity and cylindricity

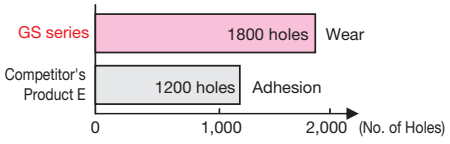


● SS400 Machine Component



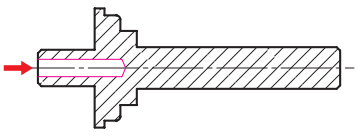
· Tool : MDW 1050GS4
· Cutting Conditions : vc = 150m/min, f = 0.3mm/rev
H=12mm, external coolant supply (water soluble)

Achieves 1.5 times longer tool life!
Good chip control



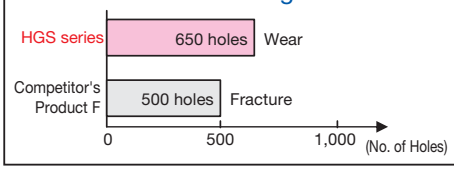
■ Application Examples (Super MULTIDRILL HGS series)

● SCr440H Automotive Component

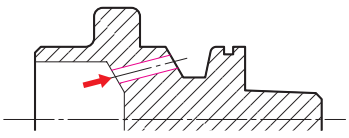


· Tool : MDW 0600HGS8
· Cutting Conditions : vc = 80m/min, f = 0.25mm/rev
H=48mm, internal coolant supply (oil-based)

Achieves 1.3 times longer tool life!

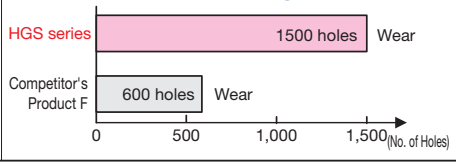


● SUJ2 Automotive Component

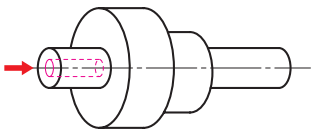


· Tool : MDW 0570HGS5
· Cutting Conditions : vc = 80m/min, f = 0.1mm/rev
H=35mm, internal coolant supply (water soluble)

Achieves 2.5 times longer tool life!

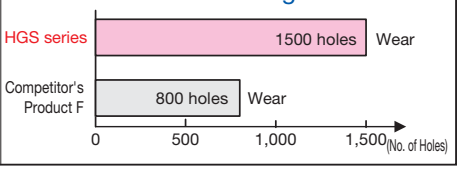


● SCM415 Machine Component



· Tool : MDW 0860HGS3
· Cutting Conditions : vc = 52m/min, f = 0.2mm/rev
H=25mm, internal coolant supply (water soluble)

Achieves 1.8 times longer tool life!



GS series (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

DEX Coat | 2D | 4D

*Refer to N36 for the tolerance of h6 and h8

Fig 1

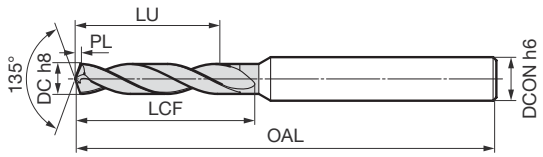
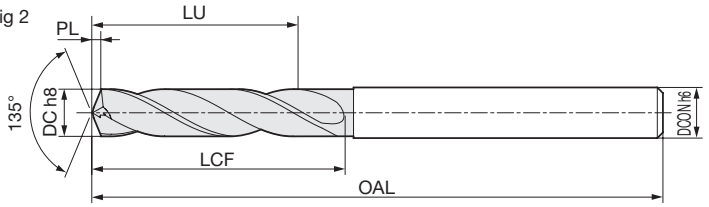


Fig 2



Diameter ø1.0 to 3.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	2	●	MDW 0100GS2	4.7	6.2	45.2	0.2	3.0	1
	4	●	0100GS4	10.7	12.2	49.2	0.2	3.0	1
1.1	2	●	MDW 0110GS2	4.6	6.2	45.2	0.2	3.0	1
	4	●	0110GS4	10.6	12.2	49.2	0.2	3.0	1
1.2	2	●	MDW 0120GS2	4.4	6.2	45.2	0.2	3.0	1
	4	●	0120GS4	10.4	12.2	49.2	0.2	3.0	1
1.3	2	●	MDW 0130GS2	4.4	6.3	45.3	0.3	3.0	1
	4	●	0130GS4	10.4	12.3	49.3	0.3	3.0	1
1.4	2	●	MDW 0140GS2	4.2	6.3	45.3	0.3	3.0	1
	4	●	0140GS4	10.2	12.3	49.3	0.3	3.0	1
1.5	2	●	MDW 0150GS2	4.1	6.3	45.3	0.3	3.0	1
	4	●	0150GS4	10.1	12.3	49.3	0.3	3.0	1
1.6	2	●	MDW 0160GS2	5.9	8.3	45.3	0.3	3.0	1
	4	●	0160GS4	12.9	15.3	49.3	0.3	3.0	1
1.7	2	●	MDW 0170GS2	5.9	8.4	45.4	0.4	3.0	1
	4	●	0170GS4	12.9	15.4	49.4	0.4	3.0	1
1.8	2	●	MDW 0180GS2	5.7	8.4	45.4	0.4	3.0	1
	4	●	0180GS4	12.7	15.4	49.4	0.4	3.0	1
1.9	2	●	MDW 0190GS2	5.6	8.4	45.4	0.4	3.0	1
	4	●	0190GS4	12.6	15.4	49.4	0.4	3.0	1
2.0	2	●	MDW 0200GS2	5.4	8.4	45.4	0.4	3.0	1
	4	●	0200GS4	12.4	15.4	49.4	0.4	3.0	1
2.1	2	●	MDW 0210GS2	7.3	10.4	45.4	0.4	3.0	1
	4	●	0210GS4	14.3	17.4	49.4	0.4	3.0	1
2.2	2	●	MDW 0220GS2	7.2	10.5	45.5	0.5	3.0	1
	4	●	0220GS4	14.2	17.5	49.5	0.5	3.0	1
2.3	2	●	MDW 0230GS2	7.1	10.5	45.5	0.5	3.0	1
	4	●	0230GS4	14.1	17.5	49.5	0.5	3.0	1
2.4	2	●	MDW 0240GS2	6.9	10.5	45.5	0.5	3.0	2
	4	●	0240GS4	13.9	17.5	49.5	0.5	3.0	2
2.5	2	●	MDW 0250GS2	6.8	10.5	45.5	0.5	3.0	2
	4	●	0250GS4	13.8	17.5	49.5	0.5	3.0	2
2.6	2	●	MDW 0260GS2	9.6	13.5	45.5	0.5	3.0	2
	4	●	0260GS4	15.6	19.5	49.5	0.5	3.0	2
2.7	2	●	MDW 0270GS2	9.6	13.6	45.6	0.6	3.0	2
	4	●	0270GS4	15.6	19.6	49.6	0.6	3.0	2
2.8	2	●	MDW 0280GS2	9.4	13.6	45.6	0.6	3.0	2
	4	●	0280GS4	15.4	19.6	49.6	0.6	3.0	2
2.9	2	●	MDW 0290GS2	9.3	13.6	45.6	0.6	3.0	2
	4	●	0290GS4	15.3	19.6	49.6	0.6	3.0	2
3.0	2	●	MDW 0300GS2	9.1	13.6	45.6	0.6	3.0	2
	4	●	0300GS4	15.1	19.6	49.6	0.6	3.0	2
3.1	2	●	MDW 0310GS2	15.0	19.6	54.6	0.6	4.0	2
	4	●	0310GS4	20.0	24.6	60.6	0.6	4.0	2
3.2	2	●	MDW 0320GS2	14.9	19.7	54.7	0.7	4.0	2
	4	●	0320GS4	19.9	24.7	60.7	0.7	4.0	2
3.3	2	●	MDW 0330GS2	14.8	19.7	54.7	0.7	4.0	2
	4	●	0330GS4	19.8	24.7	60.7	0.7	4.0	2
3.4	2	●	MDW 0340GS2	14.6	19.7	54.7	0.7	4.0	2
	4	●	0340GS4	19.6	24.7	60.7	0.7	4.0	2
3.5	2	●	MDW 0350GS2	14.5	19.7	54.7	0.7	4.0	2
	4	●	0350GS4	19.5	24.7	60.7	0.7	4.0	2
3.6	2	●	MDW 0360GS2	16.3	21.7	54.7	0.7	4.0	2
	4	●	0360GS4	22.3	27.7	60.7	0.7	4.0	2
3.7	2	●	MDW 0370GS2	16.3	21.8	54.8	0.8	4.0	2
	4	●	0370GS4	22.3	27.8	60.8	0.8	4.0	2

Grade: ACX70

Diameter ø3.8 to 6.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.8	2	●	MDW 0380GS2	16.1	21.8	54.8	0.8	4.0	2
	4	●	0380GS4	22.1	27.8	60.8	0.8	4.0	2
3.9	2	●	MDW 0390GS2	16.0	21.8	54.8	0.8	4.0	2
	4	●	0390GS4	22.0	27.8	60.8	0.8	4.0	2
4.0	2	●	MDW 0400GS2	15.8	21.8	54.8	0.8	4.0	2
	4	●	0400GS4	21.8	27.8	60.8	0.8	4.0	2
4.1	2	●	MDW 0410GS2	17.7	23.8	61.8	0.8	5.0	2
	4	●	0410GS4	25.7	31.8	76.8	0.8	5.0	2
4.2	2	●	MDW 0420GS2	17.6	23.9	61.9	0.9	5.0	2
	4	●	0420GS4	25.6	31.9	76.9	0.9	5.0	2
4.3	2	●	MDW 0430GS2	17.5	23.9	61.9	0.9	5.0	2
	4	●	0430GS4	25.5	31.9	76.9	0.9	5.0	2
4.4	2	●	MDW 0440GS2	17.3	23.9	61.9	0.9	5.0	2
	4	●	0440GS4	25.3	31.9	76.9	0.9	5.0	2
4.5	2	●	MDW 0450GS2	17.2	23.9	61.9	0.9	5.0	2
	4	●	0450GS4	25.2	31.9	76.9	0.9	5.0	2
4.6	2	●	MDW 0460GS2	19.1	26.0	62.0	1.0	5.0	2
	4	●	0460GS4	32.1	39.0	77.0	1.0	5.0	2
4.7	2	●	MDW 0470GS2	19.0	26.0	62.0	1.0	5.0	2
	4	●	0470GS4	32.0	39.0	77.0	1.0	5.0	2
4.8	2	●	MDW 0480GS2	18.8	26.0	62.0	1.0	5.0	2
	4	●	0480GS4	31.8	39.0	77.0	1.0	5.0	2
4.9	2	●	MDW 0490GS2	18.7	26.0	62.0	1.0	5.0	2
	4	●	0490GS4	31.7	39.0	77.0	1.0	5.0	2
5.0	2	●	MDW 0500GS2	18.5	26.0	62.0	1.0	5.0	2
	4	●	0500GS4	31.5	39.0	77.0	1.0	5.0	2
5.1	2	●	MDW 0510GS2	18.5	26.1	66.1	1.1	6.0	2
	4	●	0510GS4	32.5	40.1	82.1	1.1	6.0	2
5.2	2	●	MDW 0520GS2	18.3	26.1	66.1	1.1	6.0	2
	4	●	0520GS4	32.3	40.1	82.1	1.1	6.0	2
5.3	2	●	MDW 0530GS2	18.2	26.1	66.1	1.1	6.0	2
	4	●	0530GS4	32.2	40.1	82.1	1.1	6.0	2
5.4	2	●	MDW 0540GS2	18.0	26.1	66.1	1.1	6.0	2
	4	●	0540GS4	32.0	40.1	82.1	1.1	6.0	2
5.5	2	●	MDW 0550GS2	17.9	26.1	66.1	1.1	6.0	2
	4	●	0550GS4	31.9	40.1	82.1	1.1	6.0	2
5.6	2	●	MDW 0560GS2	19.8	28.2	66.2	1.2	6.0	2
	4	●	0560GS4	33.8	42.2	82.2	1.2	6.0	2
5.7	2	●	MDW 0570GS2	19.7	28.2	66.2	1.2	6.0	2
	4	●	0570GS4	33.7	42.2	82.2	1.2	6.0	2
5.8	2	●	MDW 0580GS2	19.5	28.2	66.2	1.2	6.0	2
	4	●	0580GS4	33.5	42.2	82.2	1.2	6.0	2
5.9	2	●	MDW 0590GS2	19.4	28.2	66.2	1.2	6.0	2
	4	●	0590GS4	33.4	42.2	82.2	1.2	6.0	2
6.0	2	●	MDW 0600GS2	19.2	28.2	66.2	1.2	6.0	2
	4	●	0600GS4	33.2	42.2	82.2	1.2	6.0	2
6.1	2	●	MDW 0610GS2	23.2	32.3	74.3	1.3	7.0	2
	4	●	0610GS4	34.2	43.3	84.3	1.3	7.0	2
6.2	2	●	MDW 0620GS2	23.0	32.3	74.3	1.3	7.0	2
	4	●	0620GS4	34.0	43.3	84.3	1.3	7.0	2
6.3	2	●	MDW 0630GS2	22.9	32.3	74.3	1.3	7.0	2
	4	●	0630GS4	33.9	43.3	84.3	1.3	7.0	2
6.4	2	●	MDW 0640GS2	22.7	32.3	74.3	1.3	7.0	2
	4	●	0640GS4	33.7	43.3	84.3	1.3	7.0	2
6.5	2	●	MDW 0650GS2	22.6	32.3	74.3	1.3	7.0	2
	4	●	0650GS4	33.6	43.3	84.3	1.3	7.0	2

Grade: ACX70

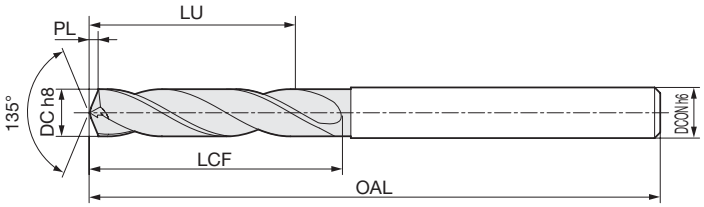
GS series (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

DEX Coat 2D 4D

*Refer to N36 for the tolerance of h6 and h8

Fig 2



Diameter ø6.6 to 9.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.6	2	●	MDW 0660GS2	24.5	34.4	74.4	1.4	7.0	2
	4	●	0660GS4	34.5	44.4	84.4	1.4	7.0	2
6.7	2	●	MDW 0670GS2	24.4	34.4	74.4	1.4	7.0	2
	4	●	0670GS4	34.4	44.4	84.4	1.4	7.0	2
6.8	2	●	MDW 0680GS2	24.2	34.4	74.4	1.4	7.0	2
	4	●	0680GS4	34.2	44.4	84.4	1.4	7.0	2
6.9	2	●	MDW 0690GS2	24.1	34.4	74.4	1.4	7.0	2
	4	●	0690GS4	34.1	44.4	84.4	1.4	7.0	2
7.0	2	●	MDW 0700GS2	23.9	34.4	74.4	1.4	7.0	2
	4	●	0700GS4	33.9	44.4	84.4	1.4	7.0	2
7.1	2	●	MDW 0710GS2	23.9	34.5	79.5	1.5	8.0	2
	4	●	0710GS4	35.9	46.5	91.5	1.5	8.0	2
7.2	2	●	MDW 0720GS2	23.7	34.5	79.5	1.5	8.0	2
	4	●	0720GS4	35.7	46.5	91.5	1.5	8.0	2
7.3	2	●	MDW 0730GS2	23.6	34.5	79.5	1.5	8.0	2
	4	●	0730GS4	35.6	46.5	91.5	1.5	8.0	2
7.4	2	●	MDW 0740GS2	23.4	34.5	79.5	1.5	8.0	2
	4	●	0740GS4	35.4	46.5	91.5	1.5	8.0	2
7.5	2	●	MDW 0750GS2	23.4	34.6	79.6	1.6	8.0	2
	4	●	0750GS4	35.4	46.6	91.6	1.6	8.0	2
7.6	2	●	MDW 0760GS2	26.2	37.6	79.6	1.6	8.0	2
	4	●	0760GS4	38.2	49.6	91.6	1.6	8.0	2
7.7	2	●	MDW 0770GS2	26.1	37.6	79.6	1.6	8.0	2
	4	●	0770GS4	38.1	49.6	91.6	1.6	8.0	2
7.8	2	●	MDW 0780GS2	25.9	37.6	79.6	1.6	8.0	2
	4	●	0780GS4	37.9	49.6	91.6	1.6	8.0	2
7.9	2	●	MDW 0790GS2	25.8	37.6	79.6	1.6	8.0	2
	4	●	0790GS4	37.8	49.6	91.6	1.6	8.0	2
8.0	2	●	MDW 0800GS2	25.7	37.7	79.7	1.7	8.0	2
	4	●	0800GS4	37.7	49.7	91.7	1.7	8.0	2
8.1	2	●	MDW 0810GS2	25.6	37.7	83.7	1.7	9.0	2
	4	●	0810GS4	42.6	54.7	99.7	1.7	9.0	2
8.2	2	●	MDW 0820GS2	25.4	37.7	83.7	1.7	9.0	2
	4	●	0820GS4	42.4	54.7	99.7	1.7	9.0	2
8.3	2	●	MDW 0830GS2	25.3	37.7	83.7	1.7	9.0	2
	4	●	0830GS4	42.3	54.7	99.7	1.7	9.0	2
8.4	2	●	MDW 0840GS2	25.1	37.7	83.7	1.7	9.0	2
	4	●	0840GS4	42.1	54.7	99.7	1.7	9.0	2
8.5	2	●	MDW 0850GS2	25.1	37.8	83.8	1.8	9.0	2
	4	●	0850GS4	42.1	54.8	99.8	1.8	9.0	2
8.6	2	●	MDW 0860GS2	26.9	39.8	83.8	1.8	9.0	2
	4	●	0860GS4	43.9	56.8	99.8	1.8	9.0	2
8.7	2	●	MDW 0870GS2	26.8	39.8	83.8	1.8	9.0	2
	4	●	0870GS4	43.8	56.8	99.8	1.8	9.0	2
8.8	2	●	MDW 0880GS2	26.6	39.8	83.8	1.8	9.0	2
	4	●	0880GS4	43.6	56.8	99.8	1.8	9.0	2
8.9	2	●	MDW 0890GS2	26.5	39.8	83.8	1.8	9.0	2
	4	●	0890GS4	43.5	56.8	99.8	1.8	9.0	2
9.0	2	●	MDW 0900GS2	26.4	39.9	83.9	1.9	9.0	2
	4	●	0900GS4	43.4	56.9	99.9	1.9	9.0	2
9.1	2	●	MDW 0910GS2	26.3	39.9	88.9	1.9	10.0	2
	4	●	0910GS4	46.3	59.9	106.9	1.9	10.0	2
9.2	2	●	MDW 0920GS2	26.1	39.9	88.9	1.9	10.0	2
	4	●	0920GS4	46.1	59.9	106.9	1.9	10.0	2
9.3	2	●	MDW 0930GS2	26.0	39.9	88.9	1.9	10.0	2
	4	●	0930GS4	46.0	59.9	106.9	1.9	10.0	2

Grade: ACX70

Diameter ø9.4 to 12.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.4	2	●	MDW 0940GS2	25.8	39.9	88.9	1.9	10.0	2
	4	●	0940GS4	45.8	59.9	106.9	1.9	10.0	2
9.5	2	●	MDW 0950GS2	25.8	40.0	89.0	2.0	10.0	2
	4	●	0950GS4	45.8	60.0	107.0	2.0	10.0	2
9.6	2	●	MDW 0960GS2	28.6	43.0	89.0	2.0	10.0	2
	4	●	0960GS4	47.6	62.0	107.0	2.0	10.0	2
9.7	2	●	MDW 0970GS2	28.5	43.0	89.0	2.0	10.0	2
	4	●	0970GS4	47.5	62.0	107.0	2.0	10.0	2
9.8	2	●	MDW 0980GS2	28.3	43.0	89.0	2.0	10.0	2
	4	●	0980GS4	47.3	62.0	107.0	2.0	10.0	2
9.9	2	●	MDW 0990GS2	28.2	43.0	89.0	2.0	10.0	2
	4	●	0990GS4	47.2	62.0	107.0	2.0	10.0	2
10.0	2	●	MDW 1000GS2	28.1	43.1	89.1	2.1	10.0	2
	4	●	1000GS4	47.1	62.1	107.1	2.1	10.0	2
10.1	2	●	MDW 1010GS2	28.0	43.1	95.1	2.1	11.0	2
	4	●	1010GS4	53.0	68.1	116.1	2.1	11.0	2
10.2	2	●	MDW 1020GS2	27.8	43.1	95.1	2.1	11.0	2
	4	●	1020GS4	52.8	68.1	116.1	2.1	11.0	2
10.3	2	●	MDW 1030GS2	27.7	43.1	95.1	2.1	11.0	2
	4	●	1030GS4	52.7	68.1	116.1	2.1	11.0	2
10.4	2	●	MDW 1040GS2	27.6	43.2	95.2	2.2	11.0	2
	4	●	1040GS4	52.6	68.2	116.2	2.2	11.0	2
10.5	2	●	MDW 1050GS2	27.5	43.2	95.2	2.2	11.0	2
	4	●	1050GS4	52.5	68.2	116.2	2.2	11.0	2
10.6	2	●	MDW 1060GS2	31.3	47.2	95.2	2.2	11.0	2
	4	●	1060GS4	54.3	70.2	116.2	2.2	11.0	2
10.7	2	●	MDW 1070GS2	31.2	47.2	95.2	2.2	11.0	2
	4	●	1070GS4	54.2	70.2	116.2	2.2	11.0	2
10.8	2	●	MDW 1080GS2	31.0	47.2	95.2	2.2	11.0	2
	4	●	1080GS4	54.0	70.2	116.2	2.2	11.0	2
10.9	2	●	MDW 1090GS2	31.0	47.3	95.3	2.3	11.0	2
	4	●	1090GS4	54.0	70.3	116.3	2.3	11.0	2
11.0	2	●	MDW 1100GS2	30.8	47.3	95.3	2.3	11.0	2
	4	●	1100GS4	53.8	70.3	116.3	2.3	11.0	2
11.1	2	●	MDW 1110GS2	30.7	47.3	102.3	2.3	12.0	2
	4	●	1110GS4	56.7	73.3	123.3	2.3	12.0	2
11.2	2	●	MDW 1120GS2	30.5	47.3	102.3	2.3	12.0	2
	4	●	1120GS4	56.5	73.3	123.3	2.3	12.0	2
11.3	2	●	MDW 1130GS2	30.4	47.3	102.3	2.3	12.0	2
	4	●	1130GS4	56.4	73.3	123.3	2.3	12.0	2
11.4	2	●	MDW 1140GS2	30.3	47.4	102.4	2.4	12.0	2
	4	●	1140GS4	56.3	73.4	123.4	2.4	12.0	2
11.5	2	●	MDW 1150GS2	30.2	47.4	102.4	2.4	12.0	2
	4	●	1150GS4	56.2	73.4	123.4	2.4	12.0	2
11.6	2	●	MDW 1160GS2	32.0	49.4	102.4	2.4	12.0	2
	4	●	1160GS4	58.0	75.4	123.4	2.4	12.0	2
11.7	2	●	MDW 1170GS2	31.9	49.4	102.4	2.4	12.0	2
	4	●	1170GS4	57.9	75.4	123.4	2.4	12.0	2
11.8	2	●	MDW 1180GS2	31.7	49.4	102.4	2.4	12.0	2
	4	●	1180GS4	57.7	75.4	123.4	2.4	12.0	2
11.9	2	●	MDW 1190GS2	31.7	49.5	102.5	2.5	12.0	2
	4	●	1190GS4	57.7	75.5	123.5	2.5	12.0	2
12.0	2	●	MDW 1200GS2	31.5	49.5	102.5	2.5	12.0	2
	4	●	1200GS4	57.5	75.5	123.5	2.5	12.0	2
12.1	2		MDW 1210GS2	31.4	49.5	102.5	2.5	13.0	2
	4		1210GS4	60.4	78.5	139.5	2.5	13.0	2

Grade: ACX70

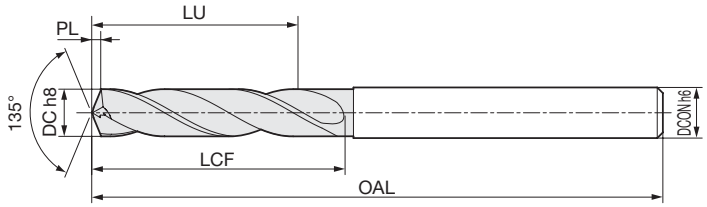
GS series (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

DEX Coat 2D 4D

*Refer to N36 for the tolerance of h6 and h8

Fig 2



Diameter ø12.2 to 14.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.2	2		MDW 1220GS2	31.2	49.5	102.5	2.5	13.0	2
	4		1220GS4	60.2	78.5	139.5	2.5	13.0	2
12.3	2		MDW 1230GS2	31.1	49.5	102.5	2.5	13.0	2
	4		1230GS4	60.1	78.5	139.5	2.5	13.0	2
12.4	2		MDW 1240GS2	31.0	49.6	102.6	2.6	13.0	2
	4		1240GS4	60.0	78.6	139.6	2.5	13.0	2
12.5	2		MDW 1250GS2	30.9	49.6	102.6	2.6	13.0	2
	4		1250GS4	59.9	78.6	139.6	2.6	13.0	2
12.6	2		MDW 1260GS2	32.7	51.6	102.6	2.6	13.0	2
	4		1260GS4	61.7	80.6	139.6	2.6	13.0	2
12.7	2		MDW 1270GS2	32.6	51.6	102.6	2.6	13.0	2
	4		1270GS4	61.6	80.6	139.6	2.6	13.0	2
12.8	2		MDW 1280GS2	32.4	51.6	102.6	2.6	13.0	2
	4		1280GS4	61.4	80.6	139.6	2.6	13.0	2
12.9	2		MDW 1290GS2	32.4	51.7	102.7	2.7	13.0	2
	4		1290GS4	61.4	80.7	139.7	2.7	13.0	2
13.0	2		MDW 1300GS2	32.2	51.7	102.7	2.7	13.0	2
	4		1300GS4	61.2	80.7	139.7	2.7	13.0	2
13.1	2		MDW 1310GS2	33.1	52.7	107.7	2.7	14.0	2
	4		1310GS4	67.1	86.7	149.7	2.7	14.0	2
13.2	2		MDW 1320GS2	32.9	52.7	107.7	2.7	14.0	2
	4		1320GS4	66.9	86.7	149.7	2.7	14.0	2
13.3	2		MDW 1330GS2	32.9	52.8	107.8	2.8	14.0	2
	4		1330GS4	66.9	86.8	149.8	2.8	14.0	2
13.4	2		MDW 1340GS2	32.7	52.8	107.8	2.8	14.0	2
	4		1340GS4	66.7	86.8	149.8	2.8	14.0	2
13.5	2		MDW 1350GS2	32.6	52.8	107.8	2.8	14.0	2
	4		1350GS4	66.6	86.8	149.8	2.8	14.0	2
13.6	2		MDW 1360GS2	34.4	54.8	107.8	2.8	14.0	2
	4		1360GS4	68.4	88.8	149.8	2.8	14.0	2
13.7	2		MDW 1370GS2	34.3	54.8	107.8	2.8	14.0	2
	4		1370GS4	68.3	88.8	149.8	2.8	14.0	2
13.8	2		MDW 1380GS2	34.2	54.9	107.9	2.9	14.0	2
	4		1380GS4	68.2	88.9	149.9	2.9	14.0	2
13.9	2		MDW 1390GS2	34.1	54.9	107.9	2.9	14.0	2
	4		1390GS4	68.1	88.9	149.9	2.9	14.0	2
14.0	2		MDW 1400GS2	33.9	54.9	107.9	2.9	14.0	2
	4		1400GS4	67.9	88.9	149.9	2.9	14.0	2
14.1	2		MDW 1410GS2	33.8	54.9	110.9	2.9	15.0	2
	4		1410GS4	70.8	91.9	155.9	2.9	15.0	2
14.2	2		MDW 1420GS2	33.6	54.9	110.9	2.9	15.0	2
	4		1420GS4	70.6	91.9	155.9	2.9	15.0	2
14.3	2		MDW 1430GS2	33.6	55.0	111.0	3.0	15.0	2
	4		1430GS4	70.6	92.0	156.0	3.0	15.0	2
14.4	2		MDW 1440GS2	33.4	55.0	111.0	3.0	15.0	2
	4		1440GS4	70.4	92.0	156.0	3.0	15.0	2
14.5	2		MDW 1450GS2	33.3	55.0	111.0	3.0	15.0	2
	4		1450GS4	70.3	92.0	156.0	3.0	15.0	2
14.6	2		MDW 1460GS2	34.1	56.0	111.0	3.0	15.0	2
	4		1460GS4	72.1	94.0	156.0	3.0	15.0	2
14.7	2		MDW 1470GS2	34.0	56.0	111.0	3.0	15.0	2
	4		1470GS4	72.0	94.0	156.0	3.0	15.0	2
14.8	2		MDW 1480GS2	33.9	56.1	111.1	3.1	15.0	2
	4		1480GS4	71.9	94.1	156.1	3.1	15.0	2
14.9	2		MDW 1490GS2	33.8	56.1	111.1	3.1	15.0	2
	4		1490GS4	71.8	94.1	156.1	3.1	15.0	2

Grade: ACX70

Diameter ø15.0 to 17.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.0	2		MDW 1500GS2	33.6	56.1	111.1	3.1	15.0	2
	4		1500GS4	71.6	94.1	156.1	3.1	15.0	2
15.1	2		MDW 1510GS2	33.5	56.1	115.1	3.1	16.0	2
	4		1510GS4	74.5	97.1	163.1	3.1	16.0	2
15.2	2		MDW 1520GS2	33.3	56.1	115.1	3.1	16.0	2
	4		1520GS4	74.3	97.1	163.1	3.1	16.0	2
15.3	2		MDW 1530GS2	33.3	56.2	115.2	3.2	16.0	2
	4		1530GS4	74.3	97.2	163.2	3.2	16.0	2
15.4	2		MDW 1540GS2	33.1	56.2	115.2	3.2	16.0	2
	4		1540GS4	74.1	97.2	163.2	3.2	16.0	2
15.5	2		MDW 1550GS2	33.0	56.2	115.2	3.2	16.0	2
	4		1550GS4	74.0	97.2	163.2	3.2	16.0	2
15.6	2		MDW 1560GS2	34.8	58.2	115.2	3.2	16.0	2
	4		1560GS4	75.8	99.2	163.2	3.2	16.0	2
15.7	2		MDW 1570GS2	34.7	58.2	115.2	3.2	16.0	2
	4		1570GS4	75.7	99.2	163.2	3.2	16.0	2
15.8	2		MDW 1580GS2	34.6	58.3	115.3	3.3	16.0	2
	4		1580GS4	75.6	99.3	163.3	3.3	16.0	2
15.9	2		MDW 1590GS2	34.5	58.3	115.3	3.3	16.0	2
	4		1590GS4	75.5	99.3	163.3	3.3	16.0	2
16.0	2		MDW 1600GS2	34.3	58.3	115.3	3.3	16.0	2
	4		1600GS4	75.3	99.3	163.3	3.3	16.0	2
16.1	2		MDW 1610GS2	35.2	59.3	119.3	3.3	17.0	2
	4		1610GS4	77.2	101.3	170.3	3.3	17.0	2
16.2	2		MDW 1620GS2	35.1	59.4	119.4	3.4	17.0	2
	4		1620GS4	77.1	101.4	170.4	3.4	17.0	2
16.3	2		MDW 1630GS2	35.0	59.4	119.4	3.4	17.0	2
	4		1630GS4	77.0	101.4	170.4	3.4	17.0	2
16.4	2		MDW 1640GS2	34.8	59.4	119.4	3.4	17.0	2
	4		1640GS4	76.8	101.4	170.4	3.4	17.0	2
16.5	2		MDW 1650GS2	34.7	59.4	119.4	3.4	17.0	2
	4		1650GS4	76.7	101.4	170.4	3.4	17.0	2
16.6	2		MDW 1660GS2	35.5	60.4	119.4	3.4	17.0	2
	4		1660GS4	76.5	101.4	170.4	3.4	17.0	2
16.7	2		MDW 1670GS2	35.5	60.5	119.5	3.5	17.0	2
	4		1670GS4	76.5	101.5	170.5	3.5	17.0	2
16.8	2		MDW 1680GS2	35.3	60.5	119.5	3.5	17.0	2
	4		1680GS4	76.3	101.5	170.5	3.5	17.0	2
16.9	2		MDW 1690GS2	35.2	60.5	119.5	3.5	17.0	2
	4		1690GS4	76.2	101.5	170.5	3.5	17.0	2
17.0	2		MDW 1700GS2	35.0	60.5	119.5	3.5	17.0	2
	4		1700GS4	76.0	101.5	170.5	3.5	17.0	2
17.1	2		MDW 1710GS2	35.9	61.5	123.5	3.5	18.0	2
	4		1710GS4	77.9	103.5	170.5	3.5	18.0	2
17.2	2		MDW 1720GS2	35.8	61.6	123.6	3.6	18.0	2
	4		1720GS4	77.8	103.6	170.6	3.6	18.0	2
17.3	2		MDW 1730GS2	35.7	61.6	123.6	3.6	18.0	2
	4		1730GS4	77.7	103.6	170.6	3.6	18.0	2
17.4	2		MDW 1740GS2	35.5	61.6	123.6	3.6	18.0	2
	4		1740GS4	77.5	103.6	170.6	3.6	18.0	2
17.5	2		MDW 1750GS2	35.4	61.6	123.6	3.6	18.0	2
	4		1750GS4	77.4	103.6	170.6	3.6	18.0	2
17.6	2		MDW 1760GS2	36.2	62.6	123.6	3.6	18.0	2
	4		1760GS4	79.2	105.6	170.6	3.6	18.0	2
17.7	2		MDW 1770GS2	36.2	62.7	123.7	3.7	18.0	2
	4		1770GS4	79.2	105.7	170.7	3.7	18.0	2

Grade: ACX70

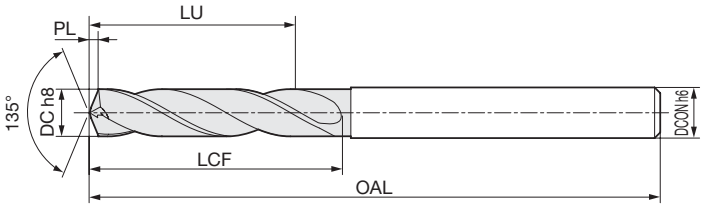
GS series (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.26% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

DEX Coat 2D 4D

*Refer to N36 for the tolerance of h6 and h8

Fig 2



Diameter ø17.8 to 18.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
17.8	2		MDW 1780GS2	36.0	62.7	123.7	3.7	18.0	2
	4		1780GS4	79.0	105.7	170.7	3.7	18.0	2
17.9	2		MDW 1790GS2	35.9	62.7	123.7	3.7	18.0	2
	4		1790GS4	78.9	105.7	170.7	3.7	18.0	2
18.0	2		MDW 1800GS2	35.7	62.7	123.7	3.7	18.0	2
	4		1800GS4	78.7	105.7	170.7	3.7	18.0	2
18.1	2		MDW 1810GS2	35.6	62.7	126.7	3.7	19.0	2
	4		1810GS4	80.6	107.7	182.7	3.7	19.0	2
18.2	2		MDW 1820GS2	35.5	62.8	126.8	3.8	19.0	2
	4		1820GS4	80.5	107.8	182.8	3.8	19.0	2
18.3	2		MDW 1830GS2	35.4	62.8	126.8	3.8	19.0	2
	4		1830GS4	80.4	107.8	182.8	3.8	19.0	2
18.4	2		MDW 1840GS2	35.2	62.8	126.8	3.8	19.0	2
	4		1840GS4	80.2	107.8	182.8	3.8	19.0	2
18.5	2		MDW 1850GS2	35.1	62.8	126.8	3.8	19.0	2
	4		1850GS4	80.1	107.8	182.8	3.8	19.0	2
18.6	2		MDW 1860GS2	36.0	63.9	126.9	3.9	19.0	2
	4		1860GS4	82.0	109.9	182.9	3.9	19.0	2
18.7	2		MDW 1870GS2	35.9	63.9	126.9	3.9	19.0	2
	4		1870GS4	81.9	109.9	182.9	3.9	19.0	2
18.8	2		MDW 1880GS2	35.7	63.9	126.9	3.9	19.0	2
	4		1880GS4	81.7	109.9	182.9	3.9	19.0	2
18.9	2		MDW 1890GS2	35.6	63.9	126.9	3.9	19.0	2
	4		1890GS4	81.6	109.9	182.9	3.9	19.0	2

Grade: ACX70

Diameter ø19.0 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
19.0	2		MDW 1900GS2	35.4	63.9	126.9	3.9	19.0	2
	4		1900GS4	81.4	109.9	182.9	3.9	19.0	2
19.1	2		MDW 1910GS2	36.4	65.0	131.0	4.0	20.0	2
	4		1910GS4	85.4	114.0	183.0	4.0	20.0	2
19.2	2		MDW 1920GS2	36.2	65.0	131.0	4.0	20.0	2
	4		1920GS4	85.2	114.0	183.0	4.0	20.0	2
19.3	2		MDW 1930GS2	36.1	65.0	131.0	4.0	20.0	2
	4		1930GS4	85.1	114.0	183.0	4.0	20.0	2
19.4	2		MDW 1940GS2	35.9	65.0	131.0	4.0	20.0	2
	4		1940GS4	84.9	114.0	183.0	4.0	20.0	2
19.5	2		MDW 1950GS2	35.8	65.0	131.0	4.0	20.0	2
	4		1950GS4	84.8	114.0	183.0	4.0	20.0	2
19.6	2		MDW 1960GS2	36.7	66.1	131.1	4.1	20.0	2
	4		1960GS4	88.7	118.1	183.1	4.1	20.0	2
19.7	2		MDW 1970GS2	36.6	66.1	131.1	4.1	20.0	2
	4		1970GS4	88.6	118.1	183.1	4.1	20.0	2
19.8	2		MDW 1980GS2	36.4	66.1	131.1	4.1	20.0	2
	4		1980GS4	88.4	118.1	183.1	4.1	20.0	2
19.9	2		MDW 1990GS2	36.3	66.1	131.1	4.1	20.0	2
	4		1990GS4	88.3	118.1	183.1	4.1	20.0	2
20.0	2		MDW 2000GS2	36.1	66.1	131.1	4.1	20.0	2
	4		2000GS4	88.1	118.1	183.1	4.1	20.0	2

Grade: ACX70

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel/General Steel (up to 300HB)	Hardened Steel (up to 45HRC)	Hardened Steel (46HRC up)	Stainless Steel (up to 200HB)	Gray Cast Iron FC250	Ductile Cast Iron FCD450
ø3.0	n	6,400	3,200	1,600	2,700	5,300	4,800
	vc	30 - **60** - 70	20 - **30** - 40	10 - **15** - 20	10 - **25** - 40	40 - **50** - 70	35 - **45** - 60
	f	0.1 - **0.15** - 0.2	0.06 - **0.07** - 0.08	0.05 - **0.07** - 0.08	0.06 - **0.08** - 0.12	0.15 - **0.2** - 0.25	0.12 - **0.15** - 0.2
ø4.0	n	4,800	2,400	1,200	2,000	4,000	3,600
	vc	30 - **60** - 80	20 - **30** - 40	10 - **15** - 20	10 - **25** - 45	40 - **50** - 70	35 - **45** - 60
	f	0.12 - **0.17** - 0.22	0.07 - **0.08** - 0.09	0.05 - **0.07** - 0.08	0.07 - **0.09** - 0.13	0.15 - **0.2** - 0.27	0.13 - **0.17** - 0.22
ø5.0	n	3,800	1,900	950	1,900	3,200	3,200
	vc	40 - **60** - 100	20 - **30** - 40	10 - **15** - 20	15 - **30** - 55	40 - **50** - 70	40 - **50** - 60
	f	0.15 - **0.2** - 0.25	0.08 - **0.09** - 0.1	0.05 - **0.07** - 0.08	0.08 - **0.1** - 0.15	0.15 - **0.2** - 0.3	0.15 - **0.2** - 0.25
ø8.0	n	3,200	1,200	600	1,400	2,000	2,400
	vc	40 - **80** - 120	20 - **30** - 40	10 - **15** - 20	15 - **35** - 55	40 - **50** - 80	50 - **60** - 70
	f	0.18 - **0.23** - 0.3	0.09 - **0.1** - 0.13	0.06 - **0.08** - 0.1	0.09 - **0.12** - 0.17	0.18 - **0.23** - 0.33	0.18 - **0.23** - 0.3
ø10.0	n	2,500	1,000	500	1,300	1,900	1,900
	vc	50 - **80** - 130	20 - **30** - 40	10 - **15** - 20	15 - **40** - 60	50 - **60** - 80	50 - **60** - 70
	f	0.2 - **0.25** - 0.35	0.1 - **0.12** - 0.15	0.06 - **0.08** - 0.1	0.1 - **0.15** - 0.2	0.2 - **0.3** - 0.35	0.2 - **0.25** - 0.35
ø12.0	n	2,100	800	400	1,100	1,700	1,600
	vc	50 - **80** - 130	20 - **30** - 40	10 - **15** - 20	15 - **40** - 60	50 - **65** - 80	50 - **60** - 70
	f	0.2 - **0.25** - 0.35	0.1 - **0.12** - 0.15	0.06 - **0.08** - 0.1	0.1 - **0.15** - 0.2	0.2 - **0.3** - 0.35	0.2 - **0.25** - 0.35
ø16.0	n	1,800	600	300	800	1,600	1,200
	vc	50 - **90** - 130	20 - **30** - 40	10 - **15** - 20	20 - **40** - 60	60 - **80** - 90	50 - **60** - 75
	f	0.22 - **0.26** - 0.35	0.1 - **0.12** - 0.15	0.07 - **0.09** - 0.11	0.1 - **0.15** - 0.2	0.22 - **0.3** - 0.35	0.22 - **0.28** - 0.35
ø20.0	n	1,600	500	250	650	1,300	950
	vc	60 - **100** - 140	20 - **30** - 40	10 - **15** - 20	20 - **40** - 60	60 - **80** - 100	50 - **60** - 80
	f	0.25 - **0.3** - 0.35	0.1 - **0.12** - 0.15	0.08 - **0.1** - 0.12	0.1 - **0.15** - 0.2	0.25 - **0.3** - 0.35	0.25 - **0.3** - 0.35

Min. - **Optimum** - Max.

HGS series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Copper Alloy

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (diameter ø1.5 to 2.4mm, single margin)

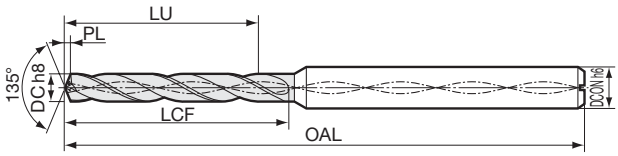
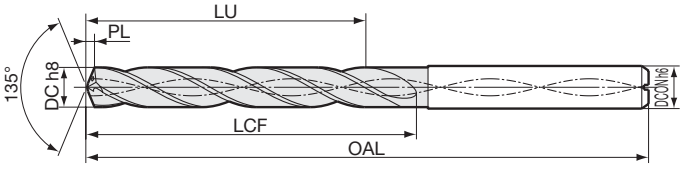


Fig 2 (diameter ø2.5 to 20.0mm, double margin)



Diameter ø1.5 to 3.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.5	3	●	MDW 0150HGS3	8.1	10.3	63.3	0.3	3.0	1
	5	●	0150HGS5	12.1	14.3	70.3	0.3	3.0	1
	8	●	0150HGS8	16.6	18.8	76.3	0.3	3.0	1
1.6	3	●	MDW 0160HGS3	10.4	12.8	63.3	0.3	3.0	1
	5	●	0160HGS5	16.9	19.3	70.3	0.3	3.0	1
	8	●	0160HGS8	21.9	24.3	76.3	0.3	3.0	1
1.7	3	●	MDW 0170HGS3	10.4	12.9	63.4	0.4	3.0	1
	5	●	0170HGS5	16.9	19.4	70.4	0.4	3.0	1
	8	●	0170HGS8	21.9	24.4	76.4	0.4	3.0	1
1.8	3	●	MDW 0180HGS3	10.2	12.9	63.4	0.4	3.0	1
	5	●	0180HGS5	16.7	19.4	70.4	0.4	3.0	1
	8	●	0180HGS8	21.7	24.4	76.4	0.4	3.0	1
1.9	3	●	MDW 0190HGS3	10.1	12.9	63.4	0.4	3.0	1
	5	●	0190HGS5	16.6	19.4	70.4	0.4	3.0	1
	8	●	0190HGS8	21.6	24.4	76.4	0.4	3.0	1
2.0	3	●	MDW 0200HGS3	9.9	12.9	63.4	0.4	3.0	1
	5	●	0200HGS5	16.4	19.4	70.4	0.4	3.0	1
	8	●	0200HGS8	21.4	24.4	76.4	0.4	3.0	1
2.1	3	●	MDW 0210HGS3	12.3	15.4	68.4	0.4	3.0	1
	5	●	0210HGS5	21.3	24.4	78.4	0.4	3.0	1
	8	●	0210HGS8	24.8	27.9	81.4	0.4	3.0	1
2.2	3	●	MDW 0220HGS3	12.2	15.5	68.5	0.5	3.0	1
	5	●	0220HGS5	21.2	24.5	78.5	0.5	3.0	1
	8	●	0220HGS8	24.7	28.0	81.5	0.5	3.0	1
2.3	3	●	MDW 0230HGS3	12.1	15.5	68.5	0.5	3.0	1
	5	●	0230HGS5	21.1	24.5	78.5	0.5	3.0	1
	8	●	0230HGS8	24.6	28.0	81.5	0.5	3.0	1
2.4	3	●	MDW 0240HGS3	11.9	15.5	68.5	0.5	3.0	1
	5	●	0240HGS5	20.9	24.5	78.5	0.5	3.0	1
	8	●	0240HGS8	24.4	28.0	81.5	0.5	3.0	1
2.5	3	●	MDW 0250HGS3	11.8	15.5	68.5	0.5	3.0	2
	5	●	0250HGS5	20.8	24.5	78.5	0.5	3.0	2
	8	●	0250HGS8	24.3	28.0	81.5	0.5	3.0	2
2.6	3	●	MDW 0260HGS3	14.1	18.0	68.5	0.5	3.0	2
	5	●	0260HGS5	24.6	28.5	78.5	0.5	3.0	2
	8	●	0260HGS8	29.6	33.5	81.5	0.5	3.0	2
2.7	3	●	MDW 0270HGS3	14.1	18.1	68.6	0.6	3.0	2
	5	●	0270HGS5	24.6	28.6	78.6	0.6	3.0	2
	8	●	0270HGS8	29.6	33.6	81.6	0.6	3.0	2
2.8	3	●	MDW 0280HGS3	13.9	18.1	68.6	0.6	3.0	2
	5	●	0280HGS5	24.4	28.6	78.6	0.6	3.0	2
	8	●	0280HGS8	29.4	33.6	81.6	0.6	3.0	2
2.9	3	●	MDW 0290HGS3	13.8	18.1	68.6	0.6	3.0	2
	5	●	0290HGS5	24.3	28.6	78.6	0.6	3.0	2
	8	●	0290HGS8	29.3	33.6	81.6	0.6	3.0	2
3.0	3	●	MDW 0300HGS3	13.6	18.1	68.6	0.6	3.0	2
	5	●	0300HGS5	24.1	28.6	78.6	0.6	3.0	2
	8	●	0300HGS8	29.1	33.6	81.6	0.6	3.0	2
3.1	3	●	MDW 0310HGS3	16.0	20.6	72.6	0.6	4.0	2
	5	●	0310HGS5	28.0	32.6	86.6	0.6	4.0	2
	8	●	0310HGS8	34.5	39.1	92.6	0.6	4.0	2
3.2	3	●	MDW 0320HGS3	15.9	20.7	72.7	0.7	4.0	2
	5	●	0320HGS5	27.9	32.7	86.7	0.7	4.0	2
	8	●	0320HGS8	34.4	39.2	92.7	0.7	4.0	2

Grade: ACX70

Diameter ø3.3 to 5.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.3	3	●	MDW 0330HGS3	15.8	20.7	72.7	0.7	4.0	2
	5	●	0330HGS5	27.8	32.7	86.7	0.7	4.0	2
	8	●	0330HGS8	34.3	39.2	92.7	0.7	4.0	2
3.4	3	●	MDW 0340HGS3	15.6	20.7	72.7	0.7	4.0	2
	5	●	0340HGS5	27.6	32.7	86.7	0.7	4.0	2
	8	●	0340HGS8	34.1	39.2	92.7	0.7	4.0	2
3.5	3	●	MDW 0350HGS3	15.5	20.7	72.7	0.7	4.0	2
	5	●	0350HGS5	27.5	32.7	86.7	0.7	4.0	2
	8	●	0350HGS8	34.0	39.2	92.7	0.7	4.0	2
3.6	3	●	MDW 0360HGS3	17.8	23.2	72.7	0.7	4.0	2
	5	●	0360HGS5	31.3	36.7	86.7	0.7	4.0	2
	8	●	0360HGS8	39.3	44.7	92.7	0.7	4.0	2
3.7	3	●	MDW 0370HGS3	17.8	23.3	72.8	0.8	4.0	2
	5	●	0370HGS5	31.3	36.8	86.8	0.8	4.0	2
	8	●	0370HGS8	39.3	44.8	92.8	0.8	4.0	2
3.8	3	●	MDW 0380HGS3	17.6	23.3	72.8	0.8	4.0	2
	5	●	0380HGS5	31.1	36.8	86.8	0.8	4.0	2
	8	●	0380HGS8	39.1	44.8	92.8	0.8	4.0	2
3.9	3	●	MDW 0390HGS3	17.5	23.3	72.8	0.8	4.0	2
	5	●	0390HGS5	31.0	36.8	86.8	0.8	4.0	2
	8	●	0390HGS8	39.0	44.8	92.8	0.8	4.0	2
4.0	3	●	MDW 0400HGS3	17.3	23.3	72.8	0.8	4.0	2
	5	●	0400HGS5	30.8	36.8	86.8	0.8	4.0	2
	8	●	0400HGS8	38.8	44.8	92.8	0.8	4.0	2
4.1	3	●	MDW 0410HGS3	19.7	25.8	80.8	0.8	5.0	2
	5	●	0410HGS5	34.7	40.8	98.8	0.8	5.0	2
	8	●	0410HGS8	44.2	50.3	105.8	0.8	5.0	2
4.2	3	●	MDW 0420HGS3	19.6	25.9	80.9	0.9	5.0	2
	5	●	0420HGS5	34.6	40.9	98.9	0.9	5.0	2
	8	●	0420HGS8	44.1	50.4	105.9	0.9	5.0	2
4.3	3	●	MDW 0430HGS3	19.5	25.9	80.9	0.9	5.0	2
	5	●	0430HGS5	34.5	40.9	98.9	0.9	5.0	2
	8	●	0430HGS8	44.0	50.4	105.9	0.9	5.0	2
4.4	3	●	MDW 0440HGS3	19.3	25.9	80.9	0.9	5.0	2
	5	●	0440HGS5	34.3	40.9	98.9	0.9	5.0	2
	8	●	0440HGS8	43.8	50.4	105.9	0.9	5.0	2
4.5	3	●	MDW 0450HGS3	19.2	25.9	80.9	0.9	5.0	2
	5	●	0450HGS5	34.2	40.9	98.9	0.9	5.0	2
	8	●	0450HGS8	43.7	50.4	105.9	0.9	5.0	2
4.6	3	●	MDW 0460HGS3	21.6	28.5	81.0	1.0	5.0	2
	5	●	0460HGS5	38.1	45.0	99.0	1.0	5.0	2
	8	●	0460HGS8	49.1	56.0	106.0	1.0	5.0	2
4.7	3	●	MDW 0470HGS3	21.5	28.5	81.0	1.0	5.0	2
	5	●	0470HGS5	38.0	45.0	99.0	1.0	5.0	2
	8	●	0470HGS8	49.0	56.0	106.0	1.0	5.0	2
4.8	3	●	MDW 0480HGS3	21.3	28.5	81.0	1.0	5.0	2
	5	●	0480HGS5	37.8	45.0	99.0	1.0	5.0	2
	8	●	0480HGS8	48.8	56.0	106.0	1.0	5.0	2
4.9	3	●	MDW 0490HGS3	21.2	28.5	81.0	1.0	5.0	2
	5	●	0490HGS5	37.7	45.0	99.0	1.0	5.0	2
	8	●	0490HGS8	48.7	56.0	106.0	1.0	5.0	2
5.0	3	●	MDW 0500HGS3	21.0	28.5	81.0	1.0	5.0	2
	5	●	0500HGS5	37.5	45.0	99.0	1.0	5.0	2
	8	●	0500HGS8	48.5	56.0	106.0	1.0	5.0	2

Grade: ACX70

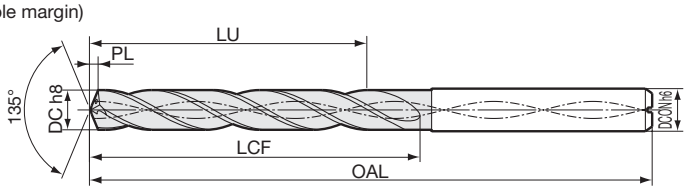
HGS series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.28% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Copper Alloy

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (diameter ø2.5 to 20.0mm, double margin)



Diameter ø5.1 to 6.8mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.1	3	●	MDW 0510HGS3	21.0	28.6	83.1	1.1	6.0	2
	5	●	0510HGS5	37.5	45.1	101.1	1.1	6.0	2
	8	●	0510HGS8	54.0	61.6	119.1	1.1	6.0	2
5.2	3	●	MDW 0520HGS3	20.8	28.6	83.1	1.1	6.0	2
	5	●	0520HGS5	37.3	45.1	101.1	1.1	6.0	2
	8	●	0520HGS8	53.8	61.6	119.1	1.1	6.0	2
5.3	3	●	MDW 0530HGS3	20.7	28.6	83.1	1.1	6.0	2
	5	●	0530HGS5	37.2	45.1	101.1	1.1	6.0	2
	8	●	0530HGS8	53.7	61.6	119.1	1.1	6.0	2
5.4	3	●	MDW 0540HGS3	20.5	28.6	83.1	1.1	6.0	2
	5	●	0540HGS5	37.0	45.1	101.1	1.1	6.0	2
	8	●	0540HGS8	53.5	61.6	119.1	1.1	6.0	2
5.5	3	●	MDW 0550HGS3	20.4	28.6	83.1	1.1	6.0	2
	5	●	0550HGS5	36.9	45.1	101.1	1.1	6.0	2
	8	●	0550HGS8	53.4	61.6	119.1	1.1	6.0	2
5.6	3	●	MDW 0560HGS3	22.8	31.2	83.2	1.2	6.0	2
	5	●	0560HGS5	40.8	49.2	101.2	1.2	6.0	2
	8	●	0560HGS8	58.8	67.2	119.2	1.2	6.0	2
5.7	3	●	MDW 0570HGS3	22.7	31.2	83.2	1.2	6.0	2
	5	●	0570HGS5	40.7	49.2	101.2	1.2	6.0	2
	8	●	0570HGS8	58.7	67.2	119.2	1.2	6.0	2
5.8	3	●	MDW 0580HGS3	22.5	31.2	83.2	1.2	6.0	2
	5	●	0580HGS5	40.5	49.2	101.2	1.2	6.0	2
	8	●	0580HGS8	58.5	67.2	119.2	1.2	6.0	2
5.9	3	●	MDW 0590HGS3	22.4	31.2	83.2	1.2	6.0	2
	5	●	0590HGS5	40.4	49.2	101.2	1.2	6.0	2
	8	●	0590HGS8	58.4	67.2	119.2	1.2	6.0	2
6.0	3	●	MDW 0600HGS3	22.2	31.2	83.2	1.2	6.0	2
	5	●	0600HGS5	40.2	49.2	101.2	1.2	6.0	2
	8	●	0600HGS8	58.2	67.2	119.2	1.2	6.0	2
6.1	3	●	MDW 0610HGS3	24.7	33.8	89.3	1.3	7.0	2
	5	●	0610HGS5	44.2	53.3	110.3	1.3	7.0	2
	8	●	0610HGS8	63.7	72.8	131.3	1.3	7.0	2
6.2	3	●	MDW 0620HGS3	24.5	33.8	89.3	1.3	7.0	2
	5	●	0620HGS5	44.0	53.3	110.3	1.3	7.0	2
	8	●	0620HGS8	63.5	72.8	131.3	1.3	7.0	2
6.3	3	●	MDW 0630HGS3	24.4	33.8	89.3	1.3	7.0	2
	5	●	0630HGS5	43.9	53.3	110.3	1.3	7.0	2
	8	●	0630HGS8	63.4	72.8	131.3	1.3	7.0	2
6.4	3	●	MDW 0640HGS3	24.2	33.8	89.3	1.3	7.0	2
	5	●	0640HGS5	43.7	53.3	110.3	1.3	7.0	2
	8	●	0640HGS8	63.2	72.8	131.3	1.3	7.0	2
6.5	3	●	MDW 0650HGS3	24.1	33.8	89.3	1.3	7.0	2
	5	●	0650HGS5	43.6	53.3	110.3	1.3	7.0	2
	8	●	0650HGS8	63.1	72.8	131.3	1.3	7.0	2
6.6	3	●	MDW 0660HGS3	26.5	36.4	89.4	1.4	7.0	2
	5	●	0660HGS5	47.5	57.4	110.4	1.4	7.0	2
	8	●	0660HGS8	68.5	78.4	131.4	1.4	7.0	2
6.7	3	●	MDW 0670HGS3	26.4	36.4	89.4	1.4	7.0	2
	5	●	0670HGS5	47.4	57.4	110.4	1.4	7.0	2
	8	●	0670HGS8	68.4	78.4	131.4	1.4	7.0	2
6.8	3	●	MDW 0680HGS3	26.2	36.4	89.4	1.4	7.0	2
	5	●	0680HGS5	47.2	57.4	110.4	1.4	7.0	2
	8	●	0680HGS8	68.2	78.4	131.4	1.4	7.0	2

Grade: ACX70

Diameter ø6.9 to 8.6mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.9	3	●	MDW 0690HGS3	26.1	36.4	89.4	1.4	7.0	2
	5	●	0690HGS5	47.1	57.4	110.4	1.4	7.0	2
	8	●	0690HGS8	68.1	78.4	131.4	1.4	7.0	2
7.0	3	●	MDW 0700HGS3	25.9	36.4	89.4	1.4	7.0	2
	5	●	0700HGS5	46.9	57.4	110.4	1.4	7.0	2
	8	●	0700HGS8	67.9	78.4	131.4	1.4	7.0	2
7.1	3	●	MDW 0710HGS3	28.4	39.0	95.5	1.5	8.0	2
	5	●	0710HGS5	50.9	61.5	119.5	1.5	8.0	2
	8	●	0710HGS8	73.4	84.0	143.5	1.5	8.0	2
7.2	3	●	MDW 0720HGS3	28.2	39.0	95.5	1.5	8.0	2
	5	●	0720HGS5	50.7	61.5	119.5	1.5	8.0	2
	8	●	0720HGS8	73.2	84.0	143.5	1.5	8.0	2
7.3	3	●	MDW 0730HGS3	28.1	39.0	95.5	1.5	8.0	2
	5	●	0730HGS5	50.6	61.5	119.5	1.5	8.0	2
	8	●	0730HGS8	73.1	84.0	143.5	1.5	8.0	2
7.4	3	●	MDW 0740HGS3	27.9	39.0	95.5	1.5	8.0	2
	5	●	0740HGS5	50.4	61.5	119.5	1.5	8.0	2
	8	●	0740HGS8	72.9	84.0	143.5	1.5	8.0	2
7.5	3	●	MDW 0750HGS3	27.9	39.1	95.6	1.6	8.0	2
	5	●	0750HGS5	50.4	61.6	119.6	1.6	8.0	2
	8	●	0750HGS8	72.9	84.1	143.6	1.6	8.0	2
7.6	3	●	MDW 0760HGS3	30.2	41.6	95.6	1.6	8.0	2
	5	●	0760HGS5	54.2	65.6	119.6	1.6	8.0	2
	8	●	0760HGS8	78.2	89.6	143.6	1.6	8.0	2
7.7	3	●	MDW 0770HGS3	30.1	41.6	95.6	1.6	8.0	2
	5	●	0770HGS5	54.1	65.6	119.6	1.6	8.0	2
	8	●	0770HGS8	78.1	89.6	143.6	1.6	8.0	2
7.8	3	●	MDW 0780HGS3	29.9	41.6	95.6	1.6	8.0	2
	5	●	0780HGS5	53.9	65.6	119.6	1.6	8.0	2
	8	●	0780HGS8	77.9	89.6	143.6	1.6	8.0	2
7.9	3	●	MDW 0790HGS3	29.8	41.6	95.6	1.6	8.0	2
	5	●	0790HGS5	53.8	65.6	119.6	1.6	8.0	2
	8	●	0790HGS8	77.8	89.6	143.6	1.6	8.0	2
8.0	3	●	MDW 0800HGS3	29.7	41.7	95.7	1.7	8.0	2
	5	●	0800HGS5	53.7	65.7	119.7	1.7	8.0	2
	8	●	0800HGS8	77.7	89.7	143.7	1.7	8.0	2
8.1	3	●	MDW 0810HGS3	32.1	44.2	101.7	1.7	9.0	2
	5	●	0810HGS5	57.6	69.7	128.7	1.7	9.0	2
	8	●	0810HGS8	83.1	95.2	155.7	1.7	9.0	2
8.2	3	●	MDW 0820HGS3	31.9	44.2	101.7	1.7	9.0	2
	5	●	0820HGS5	57.4	69.7	128.7	1.7	9.0	2
	8	●	0820HGS8	82.9	95.2	155.7	1.7	9.0	2
8.3	3	●	MDW 0830HGS3	31.8	44.2	101.7	1.7	9.0	2
	5	●	0830HGS5	57.3	69.7	128.7	1.7	9.0	2
	8	●	0830HGS8	82.8	95.2	155.7	1.7	9.0	2
8.4	3	●	MDW 0840HGS3	31.6	44.2	101.7	1.7	9.0	2
	5	●	0840HGS5	57.1	69.7	128.7	1.7	9.0	2
	8	●	0840HGS8	82.6	95.2	155.7	1.7	9.0	2
8.5	3	●	MDW 0850HGS3	31.6	44.3	101.8	1.8	9.0	2
	5	●	0850HGS5	57.1	69.8	128.8	1.8	9.0	2
	8	●	0850HGS8	82.6	95.3	155.8	1.8	9.0	2
8.6	3	●	MDW 0860HGS3	33.9	46.8	101.8	1.8	9.0	2
	5	●	0860HGS5	60.9	73.8	128.8	1.8	9.0	2
	8	●	0860HGS8	87.9	100.8	155.8	1.8	9.0	2

Grade: ACX70

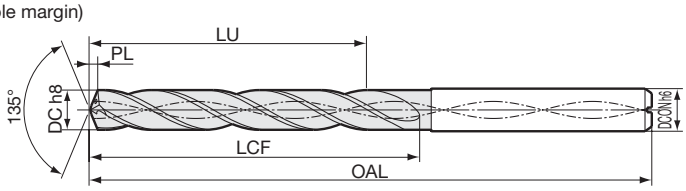
HGS series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Copper Alloy

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (diameter ø2.5 to 20.0mm, double margin)



Diameter ø8.7 to 10.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.7	3	●	MDW 0870HGS3	33.8	46.8	101.8	1.8	9.0	2
	5	●	0870HGS5	60.8	73.8	128.8	1.8	9.0	2
	8	●	0870HGS8	87.8	100.8	155.8	1.8	9.0	2
8.8	3	●	MDW 0880HGS3	33.6	46.8	101.8	1.8	9.0	2
	5	●	0880HGS5	60.6	73.8	128.8	1.8	9.0	2
	8	●	0880HGS8	87.6	100.8	155.8	1.8	9.0	2
8.9	3	●	MDW 0890HGS3	33.5	46.8	101.8	1.8	9.0	2
	5	●	0890HGS5	60.5	73.8	128.8	1.8	9.0	2
	8	●	0890HGS8	87.5	100.8	155.8	1.8	9.0	2
9.0	3	●	MDW 0900HGS3	33.4	46.9	101.9	1.9	9.0	2
	5	●	0900HGS5	60.4	73.9	128.9	1.9	9.0	2
	8	●	0900HGS8	87.4	100.9	155.9	1.9	9.0	2
9.1	3	●	MDW 0910HGS3	35.8	49.4	107.9	1.9	10.0	2
	5	●	0910HGS5	64.3	77.9	137.9	1.9	10.0	2
	8	●	0910HGS8	92.8	106.4	167.9	1.9	10.0	2
9.2	3	●	MDW 0920HGS3	35.6	49.4	107.9	1.9	10.0	2
	5	●	0920HGS5	64.1	77.9	137.9	1.9	10.0	2
	8	●	0920HGS8	92.6	106.4	167.9	1.9	10.0	2
9.3	3	●	MDW 0930HGS3	35.5	49.4	107.9	1.9	10.0	2
	5	●	0930HGS5	64.0	77.9	137.9	1.9	10.0	2
	8	●	0930HGS8	92.5	106.4	167.9	1.9	10.0	2
9.4	3	●	MDW 0940HGS3	35.3	49.4	107.9	1.9	10.0	2
	5	●	0940HGS5	63.8	77.9	137.9	1.9	10.0	2
	8	●	0940HGS8	92.3	106.4	167.9	1.9	10.0	2
9.5	3	●	MDW 0950HGS3	35.3	49.5	108.0	2.0	10.0	2
	5	●	0950HGS5	63.8	78.0	138.0	2.0	10.0	2
	8	●	0950HGS8	92.3	106.5	168.0	2.0	10.0	2
9.6	3	●	MDW 0960HGS3	37.6	52.0	108.0	2.0	10.0	2
	5	●	0960HGS5	67.6	82.0	138.0	2.0	10.0	2
	8	●	0960HGS8	97.6	112.0	168.0	2.0	10.0	2
9.7	3	●	MDW 0970HGS3	37.5	52.0	108.0	2.0	10.0	2
	5	●	0970HGS5	67.5	82.0	138.0	2.0	10.0	2
	8	●	0970HGS8	97.5	112.0	168.0	2.0	10.0	2
9.8	3	●	MDW 0980HGS3	37.3	52.0	108.0	2.0	10.0	2
	5	●	0980HGS5	67.3	82.0	138.0	2.0	10.0	2
	8	●	0980HGS8	97.3	112.0	168.0	2.0	10.0	2
9.9	3	●	MDW 0990HGS3	37.2	52.0	108.0	2.0	10.0	2
	5	●	0990HGS5	67.2	82.0	138.0	2.0	10.0	2
	8	●	0990HGS8	97.2	112.0	168.0	2.0	10.0	2
10.0	3	●	MDW 1000HGS3	37.1	52.1	108.1	2.1	10.0	2
	5	●	1000HGS5	67.1	82.1	138.1	2.1	10.0	2
	8	●	1000HGS8	97.1	112.1	168.1	2.1	10.0	2
10.1	3	●	MDW 1010HGS3	39.5	54.6	118.1	2.1	11.0	2
	5	●	1010HGS5	71.0	86.1	151.1	2.1	11.0	2
	8	●	1010HGS8	102.5	117.6	184.1	2.1	11.0	2
10.2	3	●	MDW 1020HGS3	39.3	54.6	118.1	2.1	11.0	2
	5	●	1020HGS5	70.8	86.1	151.1	2.1	11.0	2
	8	●	1020HGS8	102.3	117.6	184.1	2.1	11.0	2
10.3	3	●	MDW 1030HGS3	39.2	54.6	118.1	2.1	11.0	2
	5	●	1030HGS5	70.7	86.1	151.1	2.1	11.0	2
	8	●	1030HGS8	102.2	117.6	184.1	2.1	11.0	2
10.4	3	●	MDW 1040HGS3	39.1	54.7	118.2	2.2	11.0	2
	5	●	1040HGS5	70.6	86.2	151.2	2.2	11.0	2
	8	●	1040HGS8	102.1	117.7	184.2	2.2	11.0	2

Grade: ACX70

Diameter ø10.5 to 12.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.5	3	●	MDW 1050HGS3	39.0	54.7	118.2	2.2	11.0	2
	5	●	1050HGS5	70.5	86.2	151.2	2.2	11.0	2
	8	●	1050HGS8	102.0	117.7	184.2	2.2	11.0	2
10.6	3	●	MDW 1060HGS3	41.3	57.2	118.2	2.2	11.0	2
	5	●	1060HGS5	74.3	90.2	151.2	2.2	11.0	2
	8	●	1060HGS8	107.3	123.2	184.2	2.2	11.0	2
10.7	3	●	MDW 1070HGS3	41.2	57.2	118.2	2.2	11.0	2
	5	●	1070HGS5	74.2	90.2	151.2	2.2	11.0	2
	8	●	1070HGS8	107.2	123.2	184.2	2.2	11.0	2
10.8	3	●	MDW 1080HGS3	41.0	57.2	118.2	2.2	11.0	2
	5	●	1080HGS5	74.0	90.2	151.2	2.2	11.0	2
	8	●	1080HGS8	107.0	123.2	184.2	2.2	11.0	2
10.9	3	●	MDW 1090HGS3	41.0	57.3	118.3	2.3	11.0	2
	5	●	1090HGS5	74.0	90.3	151.3	2.3	11.0	2
	8	●	1090HGS8	107.0	123.3	184.3	2.3	11.0	2
11.0	3	●	MDW 1100HGS3	40.8	57.3	118.3	2.3	11.0	2
	5	●	1100HGS5	73.8	90.3	151.3	2.3	11.0	2
	8	●	1100HGS8	106.8	123.3	184.3	2.3	11.0	2
11.1	3	●	MDW 1110HGS3	43.2	59.8	124.3	2.3	12.0	2
	5	●	1110HGS5	77.7	94.3	160.3	2.3	12.0	2
	8	●	1110HGS8	112.2	128.8	196.3	2.3	12.0	2
11.2	3	●	MDW 1120HGS3	43.0	59.8	124.3	2.3	12.0	2
	5	●	1120HGS5	77.5	94.3	160.3	2.3	12.0	2
	8	●	1120HGS8	112.0	128.8	196.3	2.3	12.0	2
11.3	3	●	MDW 1130HGS3	42.9	59.8	124.3	2.3	12.0	2
	5	●	1130HGS5	77.4	94.3	160.3	2.3	12.0	2
	8	●	1130HGS8	111.9	128.8	196.3	2.3	12.0	2
11.4	3	●	MDW 1140HGS3	42.8	59.9	124.4	2.4	12.0	2
	5	●	1140HGS5	77.3	94.4	160.4	2.4	12.0	2
	8	●	1140HGS8	111.8	128.9	196.4	2.4	12.0	2
11.5	3	●	MDW 1150HGS3	42.7	59.9	124.4	2.4	12.0	2
	5	●	1150HGS5	77.2	94.4	160.4	2.4	12.0	2
	8	●	1150HGS8	111.7	128.9	196.4	2.4	12.0	2
11.6	3	●	MDW 1160HGS3	45.0	62.4	124.4	2.4	12.0	2
	5	●	1160HGS5	81.0	98.4	160.4	2.4	12.0	2
	8	●	1160HGS8	117.0	134.4	196.4	2.4	12.0	2
11.7	3	●	MDW 1170HGS3	44.9	62.4	124.4	2.4	12.0	2
	5	●	1170HGS5	80.9	98.4	160.4	2.4	12.0	2
	8	●	1170HGS8	116.9	134.4	196.4	2.4	12.0	2
11.8	3	●	MDW 1180HGS3	44.7	62.4	124.4	2.4	12.0	2
	5	●	1180HGS5	80.7	98.4	160.4	2.4	12.0	2
	8	●	1180HGS8	116.7	134.4	196.4	2.4	12.0	2
11.9	3	●	MDW 1190HGS3	44.7	62.5	124.5	2.5	12.0	2
	5	●	1190HGS5	80.7	98.5	160.5	2.5	12.0	2
	8	●	1190HGS8	116.7	134.5	196.5	2.5	12.0	2
12.0	3	●	MDW 1200HGS3	44.5	62.5	124.5	2.5	12.0	2
	5	●	1200HGS5	80.5	98.5	160.5	2.5	12.0	2
	8	●	1200HGS8	116.5	134.5	196.5	2.5	12.0	2
12.1	3	●	MDW 1210HGS3	46.9	65.0	130.5	2.5	13.0	2
	5	●	1210HGS5	84.4	102.5	169.5	2.5	13.0	2
	8		1210HGS8	121.9	140.0	208.5	2.5	13.0	2
12.2	3	●	MDW 1220HGS3	46.7	65.0	130.5	2.5	13.0	2
	5	●	1220HGS5	84.2	102.5	169.5	2.5	13.0	2
	8		1220HGS8	121.7	140.0	208.5	2.5	13.0	2

Grade: ACX70

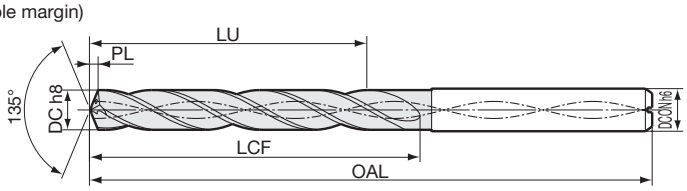
HGS series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.28% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Copper Alloy

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (diameter ø2.5 to 20.0mm, double margin)



Diameter ø12.3 to 14.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3	●	MDW 1230HGS3	46.6	65.0	130.5	2.5	13.0	2
12.3	5	●	1230HGS5	84.1	102.5	169.5	2.5	13.0	2
	8		1230HGS8	121.6	140.0	208.5	2.5	13.0	2
	3	●	MDW 1240HGS3	46.5	65.1	130.6	2.6	13.0	2
12.4	5	●	1240HGS5	84.0	102.6	169.6	2.6	13.0	2
	8		1240HGS8	121.5	140.1	208.6	2.6	13.0	2
	3	●	MDW 1250HGS3	46.4	65.1	130.6	2.6	13.0	2
12.5	5	●	1250HGS5	83.9	102.6	169.6	2.6	13.0	2
	8	●	1250HGS8	121.4	140.1	208.6	2.6	13.0	2
	3	●	MDW 1260HGS3	48.7	67.6	130.6	2.6	13.0	2
12.6	5	●	1260HGS5	87.7	106.6	169.6	2.6	13.0	2
	8		1260HGS8	126.7	145.6	208.6	2.6	13.0	2
	3	●	MDW 1270HGS3	48.6	67.6	130.6	2.6	13.0	2
12.7	5	●	1270HGS5	87.6	106.6	169.6	2.6	13.0	2
	8		1270HGS8	126.6	145.6	208.6	2.6	13.0	2
	3	●	MDW 1280HGS3	48.4	67.6	130.6	2.6	13.0	2
12.8	5	●	1280HGS5	87.4	106.6	169.6	2.6	13.0	2
	8		1280HGS8	126.4	145.6	208.6	2.6	13.0	2
	3	●	MDW 1290HGS3	48.4	67.7	130.7	2.7	13.0	2
12.9	5	●	1290HGS5	87.4	106.7	169.7	2.7	13.0	2
	8		1290HGS8	126.4	145.7	208.7	2.7	13.0	2
	3	●	MDW 1300HGS3	48.2	67.7	130.7	2.7	13.0	2
13.0	5	●	1300HGS5	87.2	106.7	169.7	2.7	13.0	2
	8	●	1300HGS8	126.2	145.7	208.7	2.7	13.0	2
	3	●	MDW 1310HGS3	50.6	70.2	136.7	2.7	14.0	2
13.1	5	●	1310HGS5	91.1	110.7	178.7	2.7	14.0	2
	8		1310HGS8	131.6	151.2	220.7	2.7	14.0	2
	3	●	MDW 1320HGS3	50.4	70.2	136.7	2.7	14.0	2
13.2	5	●	1320HGS5	90.9	110.7	178.7	2.7	14.0	2
	8		1320HGS8	131.4	151.2	220.7	2.7	14.0	2
	3	●	MDW 1330HGS3	50.4	70.3	136.8	2.8	14.0	2
13.3	5	●	1330HGS5	90.9	110.8	178.8	2.8	14.0	2
	8		1330HGS8	131.4	151.3	220.8	2.8	14.0	2
	3	●	MDW 1340HGS3	50.2	70.3	136.8	2.8	14.0	2
13.4	5	●	1340HGS5	90.7	110.8	178.8	2.8	14.0	2
	8		1340HGS8	131.2	151.3	220.8	2.8	14.0	2
	3	●	MDW 1350HGS3	50.1	70.3	136.8	2.8	14.0	2
13.5	5	●	1350HGS5	90.6	110.8	178.8	2.8	14.0	2
	8	●	1350HGS8	131.1	151.3	220.8	2.8	14.0	2
	3	●	MDW 1360HGS3	52.4	72.8	136.8	2.8	14.0	2
13.6	5	●	1360HGS5	94.4	114.8	178.8	2.8	14.0	2
	8		1360HGS8	136.4	156.8	220.8	2.8	14.0	2
	3	●	MDW 1370HGS3	52.3	72.8	136.8	2.8	14.0	2
13.7	5	●	1370HGS5	94.3	114.8	178.8	2.8	14.0	2
	8		1370HGS8	136.3	156.8	220.8	2.8	14.0	2
	3	●	MDW 1380HGS3	52.2	72.9	136.9	2.9	14.0	2
13.8	5	●	1380HGS5	94.2	114.9	178.9	2.9	14.0	2
	8		1380HGS8	136.2	156.9	220.9	2.9	14.0	2
	3	●	MDW 1390HGS3	52.1	72.9	136.9	2.9	14.0	2
13.9	5	●	1390HGS5	94.1	114.9	178.9	2.9	14.0	2
	8		1390HGS8	136.1	156.9	220.9	2.9	14.0	2
	3	●	MDW 1400HGS3	51.9	72.9	136.9	2.9	14.0	2
14.0	5	●	1400HGS5	93.9	114.9	178.9	2.9	14.0	2
	8	●	1400HGS8	135.9	156.9	220.9	2.9	14.0	2

Grade: ACX70

Diameter ø14.1 to 15.8mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3	●	MDW 1410HGS3	54.3	75.4	142.9	2.9	15.0	2
14.1	5	●	1410HGS5	97.8	118.9	187.9	2.9	15.0	2
	8		1410HGS8	141.3	162.4	232.9	2.9	15.0	2
	3	●	MDW 1420HGS3	54.1	75.4	142.9	2.9	15.0	2
14.2	5	●	1420HGS5	97.6	118.9	187.9	2.9	15.0	2
	8		1420HGS8	141.1	162.4	232.9	2.9	15.0	2
	3	●	MDW 1430HGS3	54.1	75.5	143.0	3.0	15.0	2
14.3	5	●	1430HGS5	97.6	119.0	188.0	3.0	15.0	2
	8		1430HGS8	141.1	162.5	233.0	3.0	15.0	2
	3	●	MDW 1440HGS3	53.9	75.5	143.0	3.0	15.0	2
14.4	5	●	1440HGS5	97.4	119.0	188.0	3.0	15.0	2
	8		1440HGS8	140.9	162.5	233.0	3.0	15.0	2
	3	●	MDW 1450HGS3	53.8	75.5	143.0	3.0	15.0	2
14.5	5	●	1450HGS5	97.3	119.0	188.0	3.0	15.0	2
	8	●	1450HGS8	140.8	162.5	233.0	3.0	15.0	2
	3	●	MDW 1460HGS3	56.1	78.0	143.0	3.0	15.0	2
14.6	5	●	1460HGS5	101.1	123.0	188.0	3.0	15.0	2
	8		1460HGS8	146.1	168.0	233.0	3.0	15.0	2
	3	●	MDW 1470HGS3	56.0	78.0	143.0	3.0	15.0	2
14.7	5	●	1470HGS5	101.0	123.0	188.0	3.0	15.0	2
	8		1470HGS8	146.0	168.0	233.0	3.0	15.0	2
	3	●	MDW 1480HGS3	55.9	78.1	143.1	3.1	15.0	2
14.8	5	●	1480HGS5	100.9	123.1	188.1	3.1	15.0	2
	8		1480HGS8	145.9	168.1	233.1	3.1	15.0	2
	3	●	MDW 1490HGS3	55.8	78.1	143.1	3.1	15.0	2
14.9	5	●	1490HGS5	100.8	123.1	188.1	3.1	15.0	2
	8		1490HGS8	145.8	168.1	233.1	3.1	15.0	2
	3	●	MDW 1500HGS3	55.6	78.1	143.1	3.1	15.0	2
15.0	5	●	1500HGS5	100.6	123.1	188.1	3.1	15.0	2
	8	●	1500HGS8	145.6	168.1	233.1	3.1	15.0	2
	3	●	MDW 1510HGS3	58.0	80.6	149.1	3.1	16.0	2
15.1	5	●	1510HGS5	104.5	127.1	197.1	3.1	16.0	2
	8		1510HGS8	151.0	173.6	245.1	3.1	16.0	2
	3	●	MDW 1520HGS3	57.8	80.6	149.1	3.1	16.0	2
15.2	5	●	1520HGS5	104.3	127.1	197.1	3.1	16.0	2
	8		1520HGS8	150.8	173.6	245.1	3.1	16.0	2
	3	●	MDW 1530HGS3	57.8	80.7	149.2	3.2	16.0	2
15.3	5	●	1530HGS5	104.3	127.2	197.2	3.2	16.0	2
	8		1530HGS8	150.8	173.7	245.2	3.2	16.0	2
	3	●	MDW 1540HGS3	57.6	80.7	149.2	3.2	16.0	2
15.4	5	●	1540HGS5	104.1	127.2	197.2	3.2	16.0	2
	8		1540HGS8	150.6	173.7	245.2	3.2	16.0	2
	3	●	MDW 1550HGS3	57.5	80.7	149.2	3.2	16.0	2
15.5	5	●	1550HGS5	104.0	127.2	197.2	3.2	16.0	2
	8	●	1550HGS8	150.5	173.7	245.2	3.2	16.0	2
	3	●	MDW 1560HGS3	59.8	83.2	149.2	3.2	16.0	2
15.6	5	●	1560HGS5	107.8	131.2	197.2	3.2	16.0	2
	8		1560HGS8	155.8	179.2	245.2	3.2	16.0	2
	3	●	MDW 1570HGS3	59.7	83.2	149.2	3.2	16.0	2
15.7	5	●	1570HGS5	107.7	131.2	197.2	3.2	16.0	2
	8		1570HGS8	155.7	179.2	245.2	3.2	16.0	2
	3	●	MDW 1580HGS3	59.6	83.3	149.3	3.3	16.0	2
15.8	5	●	1580HGS5	107.6	131.3	197.3	3.3	16.0	2
	8		1580HGS8	155.6	179.3	245.3	3.3	16.0	2

Grade: ACX70

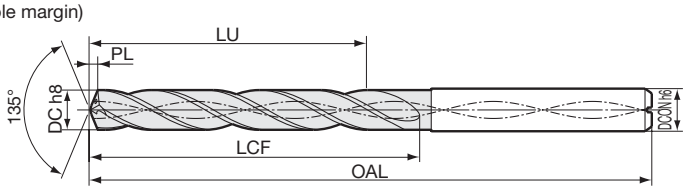
HGS series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Copper Alloy

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 (diameter ø2.5 to 20.0mm, double margin)



Diameter ø15.9 to 18.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.9	3	●	MDW 1590HGS3	59.5	83.3	149.3	3.3	16.0	2
	5	●	1590HGS5	107.5	131.3	197.3	3.3	16.0	2
	8		1590HGS8	155.5	179.3	245.3	3.3	16.0	2
16.0	3	●	MDW 1600HGS3	59.3	83.3	149.3	3.3	16.0	2
	5	●	1600HGS5	107.3	131.3	197.3	3.3	16.0	2
	8	●	1600HGS8	155.3	179.3	245.3	3.3	16.0	2
16.1	3		MDW 1610HGS3	61.7	85.8	155.3	3.3	17.0	2
	5		1610HGS5	111.2	135.3	206.3	3.3	17.0	2
16.2	3		MDW 1620HGS3	61.6	85.9	155.4	3.4	17.0	2
	5		1620HGS5	111.1	135.4	206.4	3.4	17.0	2
16.3	3		MDW 1630HGS3	61.5	85.9	155.4	3.4	17.0	2
	5		1630HGS5	111.0	135.4	206.4	3.4	17.0	2
16.4	3		MDW 1640HGS3	61.3	85.9	155.4	3.4	17.0	2
	5		1640HGS5	110.8	135.4	206.4	3.4	17.0	2
16.5	3	●	MDW 1650HGS3	61.2	85.9	155.4	3.4	17.0	2
	5	●	1650HGS5	110.7	135.4	206.4	3.4	17.0	2
16.6	3		MDW 1660HGS3	63.5	88.4	155.4	3.4	17.0	2
	5		1660HGS5	114.5	139.4	206.4	3.4	17.0	2
16.7	3		MDW 1670HGS3	63.5	88.5	155.5	3.5	17.0	2
	5		1670HGS5	114.5	139.5	206.5	3.5	17.0	2
16.8	3		MDW 1680HGS3	63.3	88.5	155.5	3.5	17.0	2
	5		1680HGS5	114.3	139.5	206.5	3.5	17.0	2
16.9	3		MDW 1690HGS3	63.2	88.5	155.5	3.5	17.0	2
	5		1690HGS5	114.2	139.5	206.5	3.5	17.0	2
17.0	3	●	MDW 1700HGS3	63.0	88.5	155.5	3.5	17.0	2
	5	●	1700HGS5	114.0	139.5	206.5	3.5	17.0	2
17.1	3		MDW 1710HGS3	65.4	91.0	161.5	3.5	18.0	2
	5		1710HGS5	117.9	143.5	217.5	3.5	18.0	2
17.2	3		MDW 1720HGS3	65.3	91.1	161.6	3.6	18.0	2
	5		1720HGS5	117.8	143.6	217.6	3.6	18.0	2
17.3	3		MDW 1730HGS3	65.2	91.1	161.6	3.6	18.0	2
	5		1730HGS5	117.7	143.6	217.6	3.6	18.0	2
17.4	3		MDW 1740HGS3	65.0	91.1	161.6	3.6	18.0	2
	5		1740HGS5	117.5	143.6	217.6	3.6	18.0	2
17.5	3	●	MDW 1750HGS3	64.9	91.1	161.6	3.6	18.0	2
	5	●	1750HGS5	117.4	143.6	217.6	3.6	18.0	2
17.6	3		MDW 1760HGS3	67.2	93.6	161.6	3.6	18.0	2
	5		1760HGS5	121.2	147.6	217.6	3.6	18.0	2
17.7	3		MDW 1770HGS3	67.2	93.7	161.7	3.7	18.0	2
	5		1770HGS5	121.2	147.7	217.7	3.7	18.0	2
17.8	3		MDW 1780HGS3	67.0	93.7	161.7	3.7	18.0	2
	5		1780HGS5	121.0	147.7	217.7	3.7	18.0	2
17.9	3		MDW 1790HGS3	66.9	93.7	161.7	3.7	18.0	2
	5		1790HGS5	120.9	147.7	217.7	3.7	18.0	2
18.0	3	●	MDW 1800HGS3	66.7	93.7	161.7	3.7	18.0	2
	5	●	1800HGS5	120.7	147.7	217.7	3.7	18.0	2
18.1	3		MDW 1810HGS3	69.1	96.2	167.7	3.7	19.0	2
	5		1810HGS5	124.6	151.7	224.7	3.7	19.0	2
18.2	3		MDW 1820HGS3	69.0	96.3	167.8	3.8	19.0	2
	5		1820HGS5	124.5	151.8	224.8	3.8	19.0	2
18.3	3		MDW 1830HGS3	68.9	96.3	167.8	3.8	19.0	2
	5		1830HGS5	124.4	151.8	224.8	3.8	19.0	2
18.4	3		MDW 1840HGS3	68.7	96.3	167.8	3.8	19.0	2
	5		1840HGS5	124.2	151.8	224.8	3.8	19.0	2

Grade: ACX70

Diameter ø18.5 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
18.5	3	●	MDW 1850HGS3	68.6	96.3	167.8	3.8	19.0	2
	5	●	1850HGS5	124.1	151.8	224.8	3.8	19.0	2
18.6	3		MDW 1860HGS3	71.0	98.9	167.9	3.9	19.0	2
	5		1860HGS5	128.0	155.9	224.9	3.9	19.0	2
18.7	3		MDW 1870HGS3	70.9	98.9	167.9	3.9	19.0	2
	5		1870HGS5	127.9	155.9	224.9	3.9	19.0	2
18.8	3		MDW 1880HGS3	70.7	98.9	167.9	3.9	19.0	2
	5		1880HGS5	127.7	155.9	224.9	3.9	19.0	2
18.9	3		MDW 1890HGS3	70.6	98.9	167.9	3.9	19.0	2
	5		1890HGS5	127.6	155.9	224.9	3.9	19.0	2
19.0	3	●	MDW 1900HGS3	70.4	98.9	167.9	3.9	19.0	2
	5	●	1900HGS5	127.4	155.9	224.9	3.9	19.0	2
19.1	3		MDW 1910HGS3	72.9	101.5	174.0	4.0	20.0	2
	5		1910HGS5	131.4	160.0	234.0	4.0	20.0	2
19.2	3		MDW 1920HGS3	72.7	101.5	174.0	4.0	20.0	2
	5		1920HGS5	131.2	160.0	234.0	4.0	20.0	2
19.3	3		MDW 1930HGS3	72.6	101.5	174.0	4.0	20.0	2
	5		1930HGS5	131.1	160.0	234.0	4.0	20.0	2
19.4	3		MDW 1940HGS3	72.4	101.5	174.0	4.0	20.0	2
	5		1940HGS5	130.9	160.0	234.0	4.0	20.0	2
19.5	3	●	MDW 1950HGS3	72.3	101.5	174.0	4.0	20.0	2
	5	●	1950HGS5	130.8	160.0	234.0	4.0	20.0	2
19.6	3		MDW 1960HGS3	74.7	104.1	174.1	4.1	20.0	2
	5		1960HGS5	134.7	164.1	234.1	4.1	20.0	2
19.7	3		MDW 1970HGS3	74.6	104.1	174.1	4.1	20.0	2
	5		1970HGS5	134.6	164.1	234.1	4.1	20.0	2
19.8	3		MDW 1980HGS3	74.4	104.1	174.1	4.1	20.0	2
	5		1980HGS5	134.4	164.1	234.1	4.1	20.0	2
19.9	3		MDW 1990HGS3	74.3	104.1	174.1	4.1	20.0	2
	5		1990HGS5	134.3	164.1	234.1	4.1	20.0	2
20.0	3	●	MDW 2000HGS3	74.1	104.1	174.1	4.1	20.0	2
	5	●	2000HGS5	134.1	164.1	234.1	4.1	20.0	2

Grade: ACX70

HGS series (Internal Coolant Supply)

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel/General Steel (up to 300HB)	Hardened Steel (up to 45HRC)	Hardened Steel (46HRC up)	Stainless Steel (up to 200HB)	Gray Cast Iron FC250	Ductile Cast Iron FCD450	Titanium Alloy 6Al-4V-Ti	Ni-based Heat-resistant Alloy (Inconel 718)
ø3.0	n	6,400	3,200	1,600	4,200	7,400	5,300	3,200	1,100
	vc	30 - **60** - 100	20 - **30** - 40	10 - **15** - 20	30 - **40** - 50	50 - **70** - 90	40 - **50** - 80	20 - **30** - 40	5 - **10** - 30
	f	0.10 - **0.15** - 0.20	0.06 - **0.07** - 0.08	0.05 - **0.07** - 0.08	0.06 - **0.08** - 0.12	0.15 - **0.20** - 0.25	0.12 - **0.15** - 0.20	0.08 - **0.09** - 0.10	0.05 - **0.06** - 0.08
ø4.0	n	5,600	2,400	1,200	3,200	5,600	4,000	2,400	800
	vc	40 - **70** - 110	20 - **30** - 40	10 - **15** - 20	30 - **40** - 55	50 - **70** - 90	40 - **50** - 80	20 - **30** - 40	5 - **10** - 30
	f	0.15 - **0.2** - 0.25	0.07 - **0.08** - 0.09	0.05 - **0.07** - 0.08	0.07 - **0.10** - 0.13	0.15 - **0.20** - 0.25	0.13 - **0.18** - 0.23	0.08 - **0.09** - 0.10	0.05 - **0.06** - 0.08
ø5.0	n	5,100	1,900	950	2,500	4,500	3,200	1,900	600
	vc	50 - **80** - 120	20 - **30** - 40	10 - **15** - 20	30 - **40** - 60	50 - **70** - 90	40 - **50** - 80	20 - **30** - 40	5 - **10** - 30
	f	0.15 - **0.2** - 0.25	0.08 - **0.09** - 0.10	0.05 - **0.07** - 0.08	0.08 - **0.12** - 0.15	0.15 - **0.20** - 0.30	0.15 - **0.20** - 0.25	0.08 - **0.09** - 0.10	0.05 - **0.06** - 0.08
ø8.0	n	3,600	1,200	600	1,800	3,200	2,400	1,200	600
	vc	60 - **90** - 140	20 - **30** - 40	10 - **15** - 20	30 - **45** - 70	60 - **80** - 100	50 - **60** - 90	20 - **30** - 40	10 - **15** - 30
	f	0.18 - **0.25** - 0.30	0.09 - **0.10** - 0.13	0.06 - **0.08** - 0.10	0.09 - **0.14** - 0.18	0.18 - **0.23** - 0.33	0.18 - **0.23** - 0.30	0.08 - **0.09** - 0.10	0.07 - **0.08** - 0.09
ø10.0	n	3,200	1,000	500	1,600	2,500	1,900	950	500
	vc	70 - **100** - 150	20 - **30** - 40	10 - **15** - 20	40 - **50** - 80	60 - **80** - 100	50 - **60** - 90	20 - **30** - 40	10 - **15** - 30
	f	0.20 - **0.25** - 0.35	0.10 - **0.12** - 0.15	0.06 - **0.08** - 0.10	0.10 - **0.15** - 0.20	0.20 - **0.30** - 0.35	0.20 - **0.25** - 0.35	0.08 - **0.10** - 0.12	0.08 - **0.09** - 0.10
ø12.0	n	2,700	800	400	1,300	2,100	1,600	800	400
	vc	70 - **100** - 150	20 - **30** - 40	10 - **15** - 20	40 - **50** - 80	60 - **80** - 100	50 - **60** - 90	20 - **30** - 40	10 - **15** - 30
	f	0.20 - **0.25** - 0.35	0.10 - **0.12** - 0.15	0.06 - **0.08** - 0.10	0.10 - **0.15** - 0.20	0.20 - **0.30** - 0.35	0.20 - **0.25** - 0.35	0.08 - **0.10** - 0.12	0.08 - **0.09** - 0.10
ø16.0	n	2,200	600	300	1,200	1,800	1,400	600	400
	vc	75 - **110** - 150	20 - **30** - 40	10 - **15** - 20	45 - **60** - 80	65 - **90** - 110	55 - **70** - 95	25 - **30** - 40	15 - **20** - 35
	f	0.22 - **0.27** - 0.35	0.10 - **0.12** - 0.15	0.07 - **0.09** - 0.11	0.10 - **0.15** - 0.20	0.25 - **0.30** - 0.35	0.22 - **0.28** - 0.35	0.09 - **0.11** - 0.13	0.08 - **0.09** - 0.10
ø20.0	n	1,900	500	250	950	1,600	1,300	500	300
	vc	80 - **120** - 160	20 - **30** - 40	10 - **15** - 20	45 - **60** - 80	70 - **100** - 120	60 - **80** - 100	25 - **30** - 40	15 - **20** - 35
	f	0.25 - **0.30** - 0.35	0.10 - **0.12** - 0.15	0.08 - **0.10** - 0.12	0.10 - **0.15** - 0.20	0.25 - **0.30** - 0.35	0.25 - **0.30** - 0.35	0.10 - **0.12** - 0.15	0.08 - **0.09** - 0.10

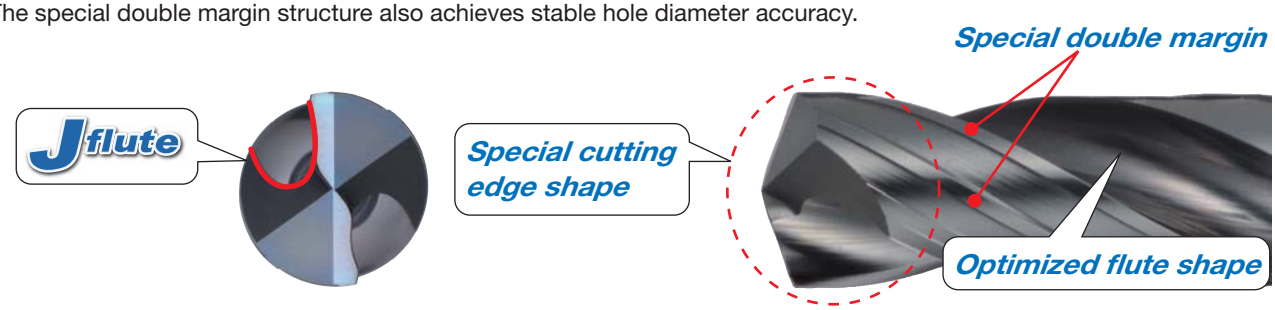
Min. - **Optimum** - Max.

■ General Features

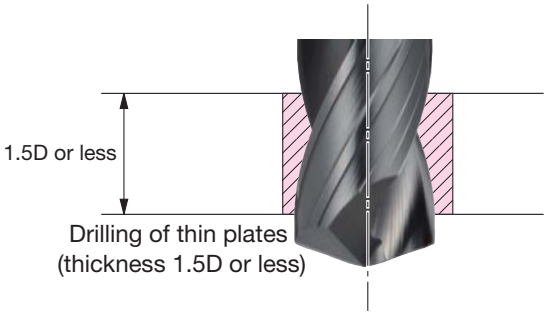
The J flutes of the Super MULTIDRILL WGS series have been tuned for improved chip breaking capabilities during drilling of thin plates. Excellent sharpness prevents hardening from drilling.
The special double margin structure also achieves stable hole diameter accuracy.

■ Features and Applications

J flutes (flute shape) have been tuned to create a specialized shape for drilling of thin plates.
The special double margin structure also achieves stable hole diameter accuracy.



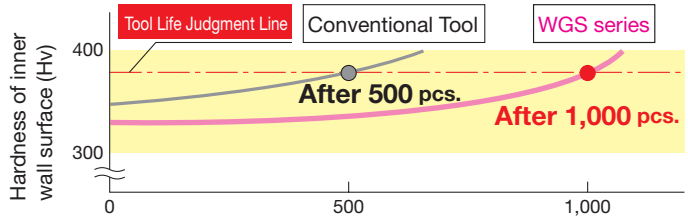
■ Target Workpieces



[Common automotive components]
- Bearing hub (inner and outer rings)
- Knuckle
- Differential ring
- Components such as bolt holes in automobile flange parts

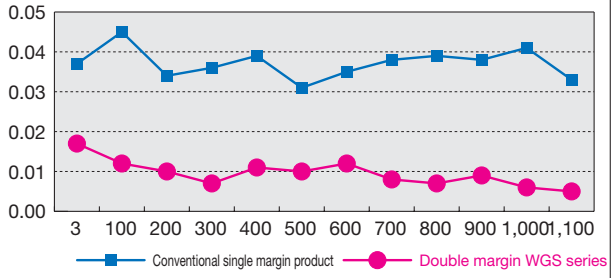
■ Cutting Performance

● Reduces hardening of the workpiece surface during drilling



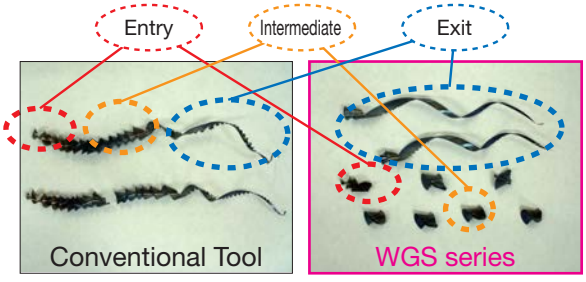
Work Material : S53C
Cutting Conditions : vc = 70m/min, f = 0.2mm/rev
H=13mm

● Stable hole expansion tolerance



Work Material : S50C
Cutting Conditions : vc = 80m/min, f = 0.25mm/rev
H=16mm

● Better chip breaking capabilities



Work Material : SUJ2
Cutting Conditions : vc = 80m/min, f = 0.25mm/rev
H=13mm

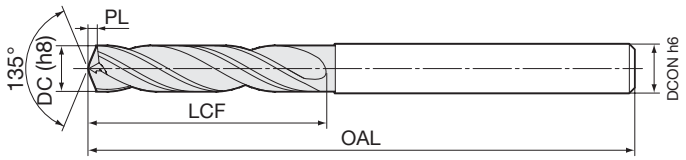
WGS series (External Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron

DEX Coat 2D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Body

Dimensions (mm)

Dia. DC	Cat. No.	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.8 to 7.0	MDW 0680 to 0700WGS2	34	74	1.4	7.0	1
7.1 to 7.5	MDW 0710 to 0750WGS2	35	80	1.5	8.0	1
7.6 to 8.0	0760 to 0800WGS2	38	80	1.6	8.0	1
8.1 to 8.5	MDW 0810 to 0850WGS2	38	84	1.7	9.0	1
8.6 to 9.0	0860 to 0900WGS2	40	84	1.8	9.0	1
9.1 to 9.5	MDW 0910 to 0950WGS2	40	89	1.9	10.0	1
9.6 to 10.0	0960 to 1000WGS2	43	89	2.0	10.0	1
10.1 to 10.5	MDW 1010 to 1050WGS2	43	95	2.1	11.0	1
10.6 to 11.0	1060 to 1100WGS2	47	95	2.2	11.0	1
11.1 to 11.5	MDW 1110 to 1150WGS2	47	102	2.3	12.0	1
11.6 to 12.0	1160 to 1200WGS2	49	102	2.4	12.0	1
12.1 to 12.5	MDW 1210 to 1250WGS2	50	103	2.6	13.0	1
12.6 to 13.0	1260 to 1300WGS2	52	103	2.7	13.0	1
13.1 to 13.5	MDW 1310 to 1350WGS2	53	108	2.8	14.0	1
13.6 to 14.0	1360 to 1400WGS2	55	108	2.9	14.0	1
14.1 to 14.5	MDW 1410 to 1450WGS2	55	111	3.0	15.0	1
14.6 to 15.0	1460 to 1500WGS2	56	111	3.1	15.0	1
15.1 to 15.5	MDW 1510 to 1550WGS2	56	115	3.2	16.0	1
15.6 to 16.0	1560 to 1600WGS2	58	115	3.3	16.0	1

Grade: ACX70

This product is a made-to-order item. Please specify the hole diameter (including tolerance) when ordering.

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel/General Steel (up to 300HB)	Stainless Steel (up to 200HB)	Gray Cast Iron FC250	Ductile Cast Iron FCD450
ø10.0	n	2,600	1,300	1,900	1,900
	vc	50 - **80** - 130	15 - **40** - 60	50 - **60** - 80	50 - **60** - 70
	f	0.20 - **0.25** - 0.35	0.10 - **0.15** - 0.20	0.20 - **0.30** - 0.35	0.20 - **0.25** - 0.35
ø16.0	n	2,000	800	1,600	1,200
	vc	60 - **100** - 140	20 - **40** - 60	60 - **80** - 100	50 - **60** - 80
	f	0.25 - **0.30** - 0.35	0.10 - **0.15** - 0.20	0.25 - **0.30** - 0.35	0.25 - **0.30** - 0.35

* The recommended cutting conditions are also affected by factors such as machine rigidity and the workpiece clamping. Please adjust the cutting conditions according to your work environment.
* If work hardening occurs during drilling, it is recommended to use a lower speed than the recommended cutting conditions.

Min. - **Optimum** - Max.

MDM series

■ General Features

- Oil holes shaped for excellent cooling performance achieves longer tool life.
- Effective cooling of the cutting edge created through fluid analysis.
  Reduces adhesion fracture.
- Chip control and workpiece hardening problems resolved.
- Outstanding stability in machining of stainless steel and exotic alloys.

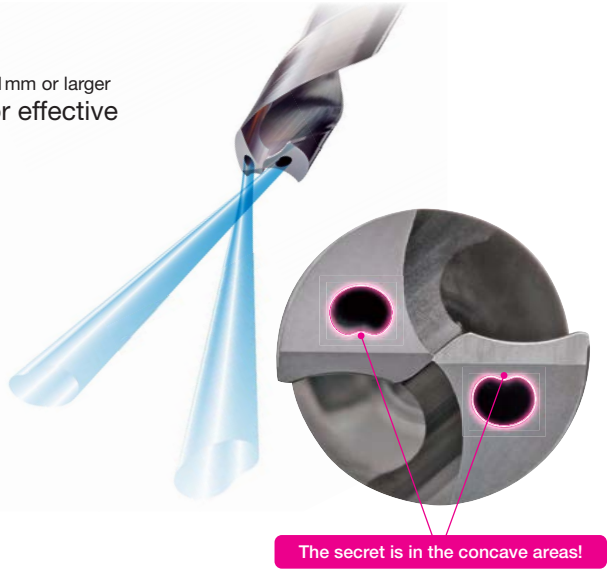
■ Features and Applications

- Greater discharge of coolant for effective cooling of the cutting edge.

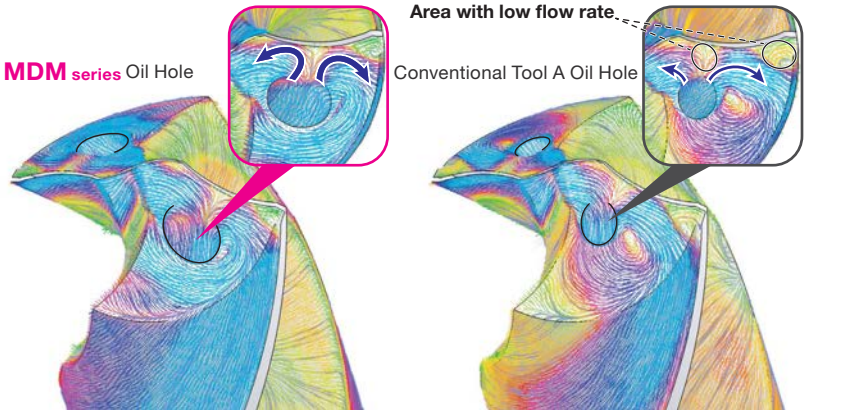
Bean Jet Cooling

*Utilised for diameters of ø4.1mm or larger

Bean-shaped oil hole supplies coolant at the cutting edge for effective cooling of the cutting edge



- Effective cooling of the cutting edge created through fluid analysis

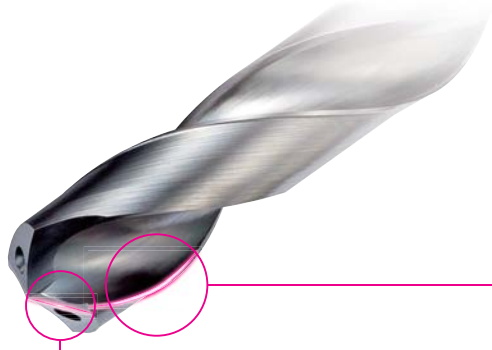


Analysed at tool rotation speed of 3,200min^{-1}

Low flow rate ■■■

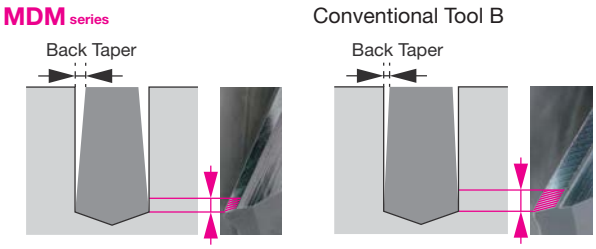
MDM series

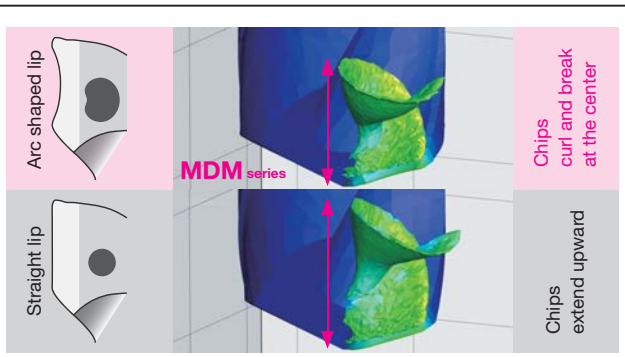
● New cutting edge design that emphasises sharpness for good chip control



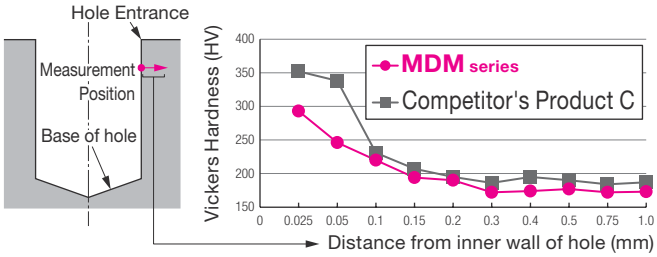
Work Material : SUS304
Machine : BT30 vertical machining centre
Tool : MDM 0400S04H05 (ø4.0mmx5D)
Cutting Conditions : vc = 80m/min, f = 0.10mm/rev, Internal Coolant Supply (water soluble)

● Narrow margin and large back taper
Reducing the contact area with the workpiece, suppressing temperature rise at the margin





● Suppressing workpiece hardening on drilled hole wall
Reduces drilling load, reducing damage to the drill and increasing the life of the reamer and tap used in post-processing

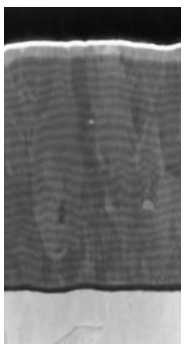


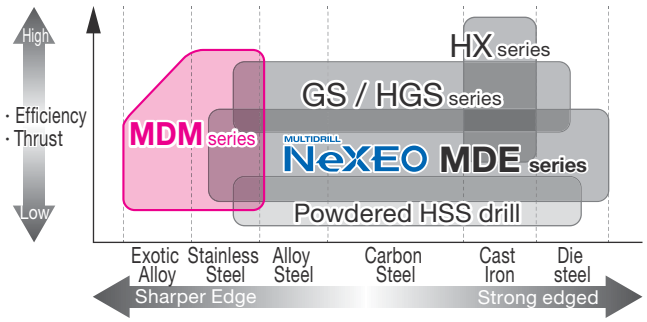
Work Material : SUS304
Machine : BT30 vertical machining centre
Tool : MDM 0800S08H05 (ø8.0mmx5D)
Cutting Conditions : vc = 80m/min, f = 0.20mm/rev, H = 40mm (through), Internal Coolant Supply (water soluble)

● Ideal grade for stainless steel and exotic alloy drilling

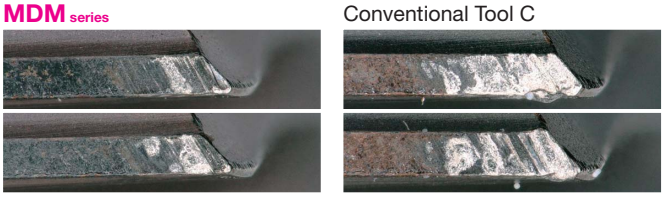
ACT70

● NX Coat
ABSOTECH™ technology for high quality, high hardness, high strength and excellent wear resistance and thermal resistance.



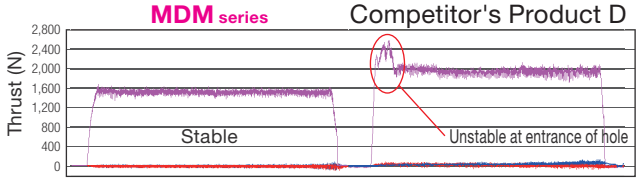


● NX Coat reduces margin wear



Work Material : SUS304, Machine: BT30 vertical machining centre
Tool : MDM 0800S08H05 (ø8.0mmx5D)
Cutting Conditions : vc = 80m/min, f = 0.20mm/rev, H = 40mm (through), Internal Coolant Supply (water soluble)

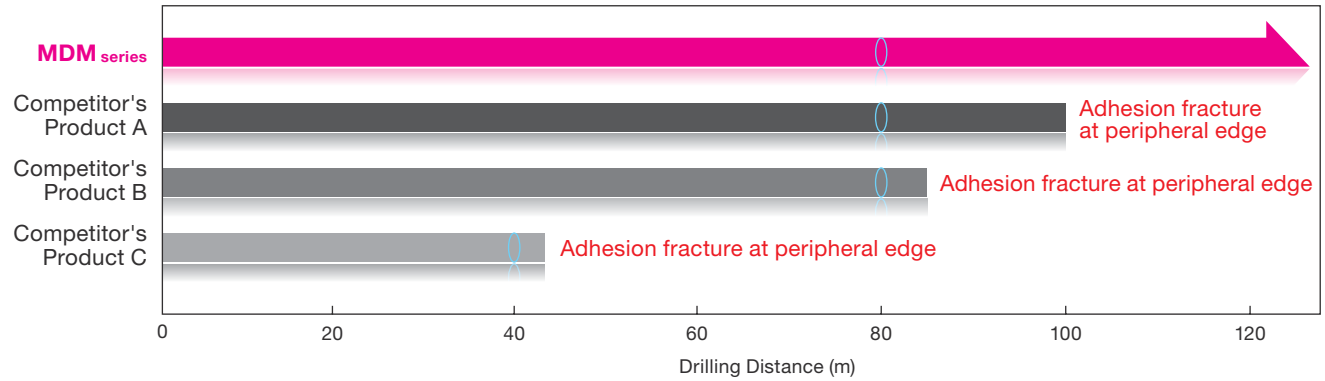
● Reduces thrust for stable drilling from the entrance to the exit of the hole

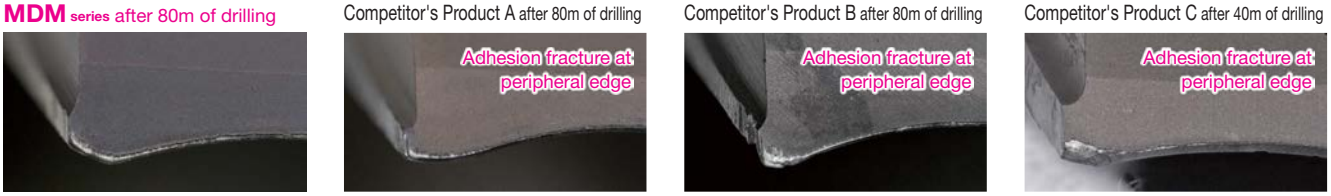


Work Material : SUS304, Machine: BT30 vertical machining centre
Tool : MDM 0800S08H05 (ø8.0mmx5D)
Cutting Conditions : vc = 80m/min, f = 0.20mm/rev, H = 40mm (through), Internal Coolant Supply (water soluble)

■ Application Examples

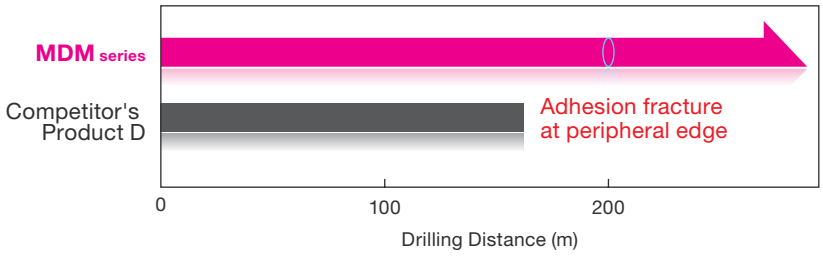
Austenitic Stainless Steel (Machining Centre)

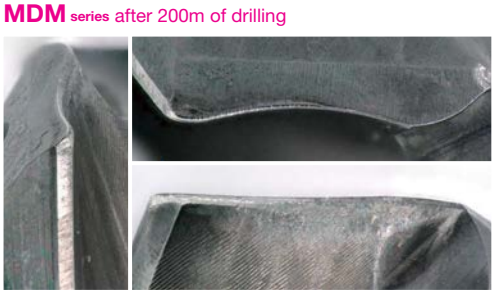




Work Material: SUS304, Machine: BT30 vertical machining centre, Tool: MDM 0800S08H05 (ø8mm×5D)
Cutting Conditions: vc = 80m/min, f = 0.20mm/rev, H = 40mm (through), Internal Coolant Supply (water soluble)

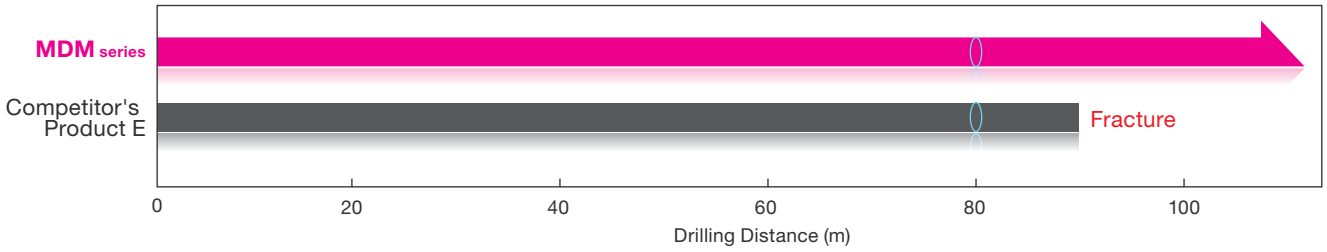
Austenitic Stainless Steel (Small Lathe)

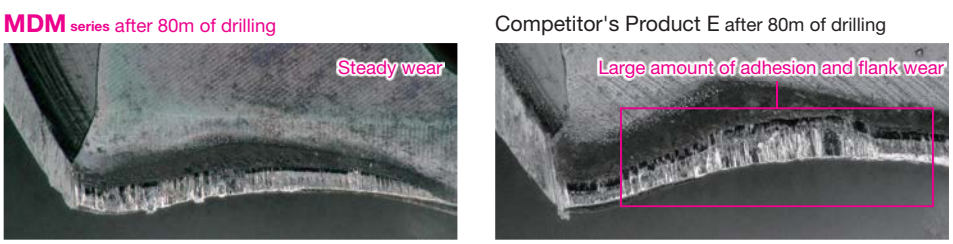




Work Material: SUS304, Machine: CNC autolathe (workpiece rotates), Tool: MDM 0540S06H03 (ø5.4mmx3D)
Cutting Conditions: vc = 47m/min, f = 0.12mm/rev, H = 25mm (blind), Internal Coolant Supply (non-water-soluble)

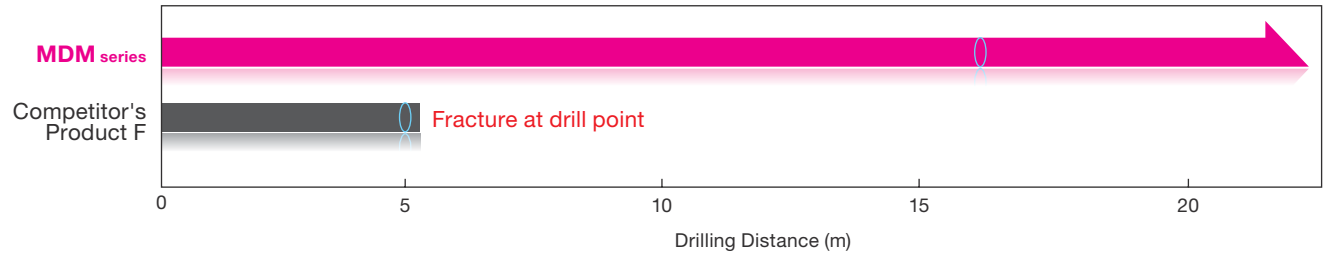
Stainless Steel with Deposition Hardened Structure



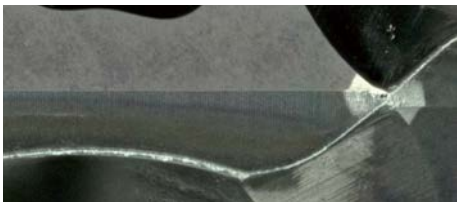


Work Material: SUS630, Machine: BT30 vertical machining centre, Tool: MDM 0400S04H05 (ø4mm×5D)
Cutting Conditions: vc = 50m/min, f = 0.10mm/rev, H = 14mm (blind), Internal Coolant Supply (water-soluble)

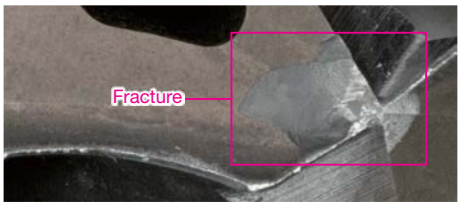
Duplex Stainless Steel



MDM series after 16m of drilling

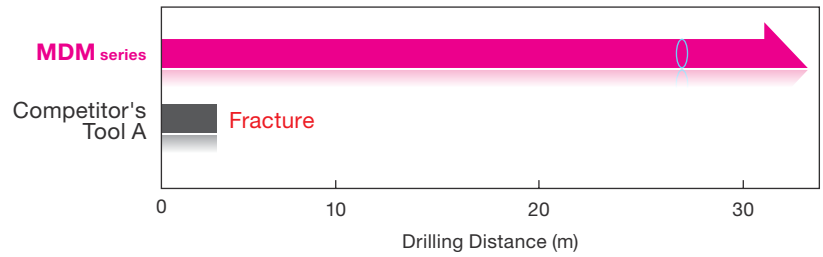


Competitor's Product F after 5m of drilling

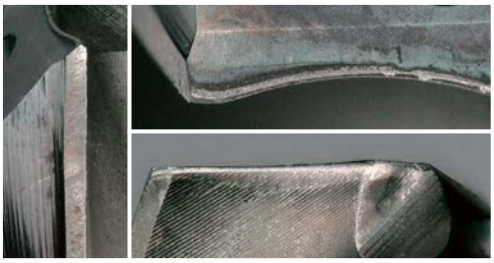


Work Material: SUS329J4L, Machine: BT30 vertical machining centre, Tool: MDM 0800S05H05 (ø8mm×5D)
Cutting Conditions: vc = 60m/min, f = 0.20mm/rev, H = 30mm (through), Internal Coolant Supply (water soluble)

Titanium Alloy



MDM series after 27m of drilling

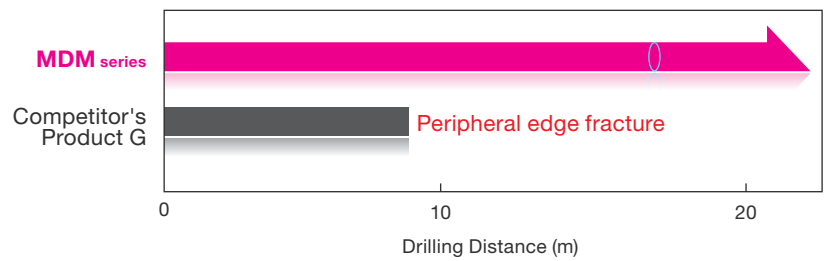


MDM series

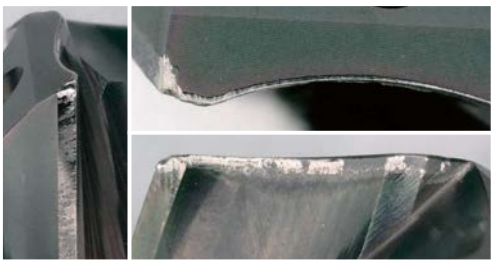
Conventional Tool A

Work Material: Ti-6Al-4V, Machine: BT50 vertical machining centre, Tool: MDM 0500S05H05 (ø5mm×5D)
Cutting Conditions: vc = 40m/min, f = 0.12mm/rev, H = 19mm (blind), Internal Coolant Supply (water-soluble)

Heat-resistant Cast Steel



MDM series after 17.1m of drilling



Work Material: SCH13X equivalent, Machine: BT50 vertical machining centre, Tool: MDM 0880S09H03 (ø8.8mmx3D)
Cutting Conditions: vc = 50m/min, f = 0.11mm/rev, H = 18mm (blind, through), Internal Coolant Supply (water soluble)

MDM series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

NX Coat | 3D | 5D

*Bean Jet Cooling is applicable to diameters ø4.1mm and up

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (diameter under ø4.1)

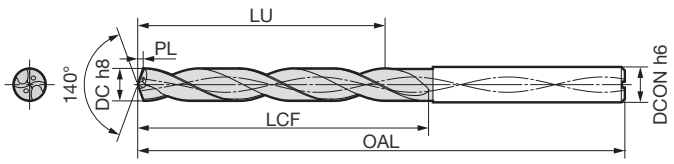
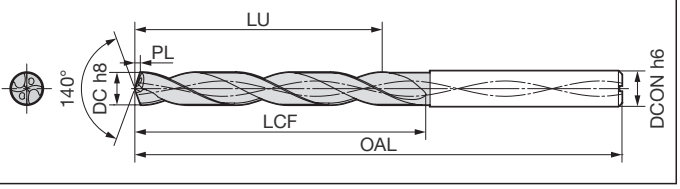


Fig 2 (diameter ø4.1 or larger) Bean Jet Cooling



Diameter ø3.0 to 4.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	MDM 0300S03H03	14.0	18.5	68.5	0.5	3.0	1
	5	●	0300S03H05	24.0	28.5	78.5	0.5	3.0	1
3.1	3	●	MDM 0310S04H03	16.0	20.6	72.6	0.6	4.0	1
	5	●	0310S04H05	28.0	32.6	86.6	0.6	4.0	1
3.2	3	●	MDM 0320S04H03	15.8	20.6	72.6	0.6	4.0	1
	5	●	0320S04H05	27.8	32.6	86.6	0.6	4.0	1
3.3	3	●	MDM 0330S04H03	15.7	20.6	72.6	0.6	4.0	1
	5	●	0330S04H05	27.7	32.6	86.6	0.6	4.0	1
3.4	3	●	MDM 0340S04H03	15.5	20.6	72.6	0.6	4.0	1
	5	●	0340S04H05	27.5	32.6	86.6	0.6	4.0	1
3.5	3	●	MDM 0350S04H03	15.4	20.6	72.6	0.6	4.0	1
	5	●	0350S04H05	27.4	32.6	86.6	0.6	4.0	1
3.6	3	●	MDM 0360S04H03	17.8	23.2	72.7	0.7	4.0	1
	5	●	0360S04H05	31.3	36.7	86.7	0.7	4.0	1
3.7	3	●	MDM 0370S04H03	17.7	23.2	72.7	0.7	4.0	1
	5	●	0370S04H05	31.2	36.7	86.7	0.7	4.0	1
3.8	3	●	MDM 0380S04H03	17.5	23.2	72.7	0.7	4.0	1
	5	●	0380S04H05	31.0	36.7	86.7	0.7	4.0	1
3.9	3	●	MDM 0390S04H03	17.4	23.2	72.7	0.7	4.0	1
	5	●	0390S04H05	30.9	36.7	86.7	0.7	4.0	1
4.0	3	●	MDM 0400S04H03	17.2	23.2	72.7	0.7	4.0	1
	5	●	0400S04H05	30.7	36.7	86.7	0.7	4.0	1
4.1	3	●	MDM 0410S05H03	19.6	25.7	80.7	0.7	5.0	2
	5	●	0410S05H05	34.6	40.7	98.7	0.7	5.0	2
4.2	3	●	MDM 0420S05H03	19.5	25.8	80.8	0.8	5.0	2
	5	●	0420S05H05	34.5	40.8	98.8	0.8	5.0	2
4.3	3	●	MDM 0430S05H03	19.4	25.8	80.8	0.8	5.0	2
	5	●	0430S05H05	34.4	40.8	98.8	0.8	5.0	2
4.4	3	●	MDM 0440S05H03	19.2	25.8	80.8	0.8	5.0	2
	5	●	0440S05H05	34.2	40.8	98.8	0.8	5.0	2
4.5	3	●	MDM 0450S05H03	19.1	25.8	80.8	0.8	5.0	2
	5	●	0450S05H05	34.1	40.8	98.8	0.8	5.0	2
4.6	3	●	MDM 0460S05H03	21.4	28.3	80.8	0.8	5.0	2
	5	●	0460S05H05	37.9	44.8	98.8	0.8	5.0	2
4.7	3	●	MDM 0470S05H03	21.4	28.4	80.9	0.9	5.0	2
	5	●	0470S05H05	37.9	44.9	98.9	0.9	5.0	2
4.8	3	●	MDM 0480S05H03	21.2	28.4	80.9	0.9	5.0	2
	5	●	0480S05H05	37.7	44.9	98.9	0.9	5.0	2
4.9	3	●	MDM 0490S05H03	21.1	28.4	80.9	0.9	5.0	2
	5	●	0490S05H05	37.6	44.9	98.9	0.9	5.0	2

Grade: ACT70

Diameter ø5.0 to 6.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.0	3	●	MDM 0500S05H03	20.9	28.4	80.9	0.9	5.0	2
	5	●	0500S05H05	37.4	44.9	98.9	0.9	5.0	2
5.1	3	●	MDM 0510S06H03	20.8	28.4	82.9	0.9	6.0	2
	5	●	0510S06H05	37.3	44.9	100.9	0.9	6.0	2
5.2	3	●	MDM 0520S06H03	20.6	28.4	82.9	0.9	6.0	2
	5	●	0520S06H05	37.1	44.9	100.9	0.9	6.0	2
5.3	3	●	MDM 0530S06H03	20.6	28.5	83.0	1.0	6.0	2
	5	●	0530S06H05	37.1	45.0	101.0	1.0	6.0	2
5.4	3	●	MDM 0540S06H03	20.4	28.5	83.0	1.0	6.0	2
	5	●	0540S06H05	36.9	45.0	101.0	1.0	6.0	2
5.5	3	●	MDM 0550S06H03	20.3	28.5	83.0	1.0	6.0	2
	5	●	0550S06H05	36.8	45.0	101.0	1.0	6.0	2
5.6	3	●	MDM 0560S06H03	22.6	31.0	83.0	1.0	6.0	2
	5	●	0560S06H05	40.6	49.0	101.0	1.0	6.0	2
5.7	3	●	MDM 0570S06H03	22.5	31.0	83.0	1.0	6.0	2
	5	●	0570S06H05	40.5	49.0	101.0	1.0	6.0	2
5.8	3	●	MDM 0580S06H03	22.4	31.1	83.1	1.1	6.0	2
	5	●	0580S06H05	40.4	49.1	101.1	1.1	6.0	2
5.9	3	●	MDM 0590S06H03	22.3	31.1	83.1	1.1	6.0	2
	5	●	0590S06H05	40.3	49.1	101.1	1.1	6.0	2
6.0	3	●	MDM 0600S06H03	22.1	31.1	83.1	1.1	6.0	2
	5	●	0600S06H05	40.1	49.1	101.1	1.1	6.0	2
6.1	3	●	MDM 0610S07H03	24.5	33.6	89.1	1.1	7.0	2
	5	●	0610S07H05	44.0	53.1	110.1	1.1	7.0	2
6.2	3	●	MDM 0620S07H03	24.3	33.6	89.1	1.1	7.0	2
	5	●	0620S07H05	43.8	53.1	110.1	1.1	7.0	2
6.3	3	●	MDM 0630S07H03	24.2	33.6	89.1	1.1	7.0	2
	5	●	0630S07H05	43.7	53.1	110.1	1.1	7.0	2
6.4	3	●	MDM 0640S07H03	24.1	33.7	89.2	1.2	7.0	2
	5	●	0640S07H05	43.6	53.2	110.2	1.2	7.0	2
6.5	3	●	MDM 0650S07H03	24.0	33.7	89.2	1.2	7.0	2
	5	●	0650S07H05	43.5	53.2	110.2	1.2	7.0	2
6.6	3	●	MDM 0660S07H03	26.3	36.2	89.2	1.2	7.0	2
	5	●	0660S07H05	47.3	57.2	110.2	1.2	7.0	2
6.7	3	●	MDM 0670S07H03	26.2	36.2	89.2	1.2	7.0	2
	5	●	0670S07H05	47.2	57.2	110.2	1.2	7.0	2
6.8	3	●	MDM 0680S07H03	26.0	36.2	89.2	1.2	7.0	2
	5	●	0680S07H05	47.0	57.2	110.2	1.2	7.0	2
6.9	3	●	MDM 0690S07H03	26.0	36.3	89.3	1.3	7.0	2
	5	●	0690S07H05	47.0	57.3	110.3	1.3	7.0	2

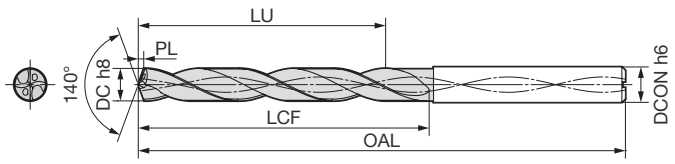
Grade: ACT70

MDM series (Internal Coolant Supply)

NX Coat | 3D | 5D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 **Bean Jet Cooling**



Diameter ø7.0 to 8.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.0	3	●	MDM 0700S07H03	25.8	36.3	89.3	1.3	7.0	2
	5	●	0700S07H05	46.8	57.3	110.3	1.3	7.0	2
7.1	3	●	MDM 0710S08H03	28.2	38.8	95.3	1.3	8.0	2
	5	●	0710S08H05	50.7	61.3	119.3	1.3	8.0	2
7.2	3	●	MDM 0720S08H03	28.0	38.8	95.3	1.3	8.0	2
	5	●	0720S08H05	50.5	61.3	119.3	1.3	8.0	2
7.3	3	●	MDM 0730S08H03	27.9	38.8	95.3	1.3	8.0	2
	5	●	0730S08H05	50.4	61.3	119.3	1.3	8.0	2
7.4	3	●	MDM 0740S08H03	27.7	38.8	95.3	1.3	8.0	2
	5	●	0740S08H05	50.2	61.3	119.3	1.3	8.0	2
7.5	3	●	MDM 0750S08H03	27.7	38.9	95.4	1.4	8.0	2
	5	●	0750S08H05	50.2	61.4	119.4	1.4	8.0	2
7.6	3	●	MDM 0760S08H03	30.0	41.4	95.4	1.4	8.0	2
	5	●	0760S08H05	54.0	65.4	119.4	1.4	8.0	2
7.7	3	●	MDM 0770S08H03	29.9	41.4	95.4	1.4	8.0	2
	5	●	0770S08H05	53.9	65.4	119.4	1.4	8.0	2
7.8	3	●	MDM 0780S08H03	29.7	41.4	95.4	1.4	8.0	2
	5	●	0780S08H05	53.7	65.4	119.4	1.4	8.0	2
7.9	3	●	MDM 0790S08H03	29.6	41.4	95.4	1.4	8.0	2
	5	●	0790S08H05	53.6	65.4	119.4	1.4	8.0	2
8.0	3	●	MDM 0800S08H03	29.5	41.5	95.5	1.5	8.0	2
	5	●	0800S08H05	53.5	65.5	119.5	1.5	8.0	2
8.1	3	●	MDM 0810S09H03	31.9	44.0	101.5	1.5	9.0	2
	5	●	0810S09H05	57.4	69.5	128.5	1.5	9.0	2
8.2	3	●	MDM 0820S09H03	31.7	44.0	101.5	1.5	9.0	2
	5	●	0820S09H05	57.2	69.5	128.5	1.5	9.0	2
8.3	3	●	MDM 0830S09H03	31.6	44.0	101.5	1.5	9.0	2
	5	●	0830S09H05	57.1	69.5	128.5	1.5	9.0	2
8.4	3	●	MDM 0840S09H03	31.4	44.0	101.5	1.5	9.0	2
	5	●	0840S09H05	56.9	69.5	128.5	1.5	9.0	2
8.5	3	●	MDM 0850S09H03	31.3	44.0	101.5	1.5	9.0	2
	5	●	0850S09H05	56.8	69.5	128.5	1.5	9.0	2
8.6	3	●	MDM 0860S09H03	33.7	46.6	101.6	1.6	9.0	2
	5	●	0860S09H05	60.7	73.6	128.6	1.6	9.0	2
8.7	3	●	MDM 0870S09H03	33.6	46.6	101.6	1.6	9.0	2
	5	●	0870S09H05	60.6	73.6	128.6	1.6	9.0	2
8.8	3	●	MDM 0880S09H03	33.4	46.6	101.6	1.6	9.0	2
	5	●	0880S09H05	60.4	73.6	128.6	1.6	9.0	2
8.9	3	●	MDM 0890S09H03	33.3	46.6	101.6	1.6	9.0	2
	5	●	0890S09H05	60.3	73.6	128.6	1.6	9.0	2

Grade: ACT70

Diameter ø9.0 to 10.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.0	3	●	MDM 0900S09H03	33.1	46.6	101.6	1.6	9.0	2
	5	●	0900S09H05	60.1	73.6	128.6	1.6	9.0	2
9.1	3	●	MDM 0910S10H03	35.6	49.2	107.7	1.7	10.0	2
	5	●	0910S10H05	64.1	77.7	137.7	1.7	10.0	2
9.2	3	●	MDM 0920S10H03	35.4	49.2	107.7	1.7	10.0	2
	5	●	0920S10H05	63.9	77.7	137.7	1.7	10.0	2
9.3	3	●	MDM 0930S10H03	35.3	49.2	107.7	1.7	10.0	2
	5	●	0930S10H05	63.8	77.7	137.7	1.7	10.0	2
9.4	3	●	MDM 0940S10H03	35.1	49.2	107.7	1.7	10.0	2
	5	●	0940S10H05	63.6	77.7	137.7	1.7	10.0	2
9.5	3	●	MDM 0950S10H03	35.0	49.2	107.7	1.7	10.0	2
	5	●	0950S10H05	63.5	77.7	137.7	1.7	10.0	2
9.6	3	●	MDM 0960S10H03	37.3	51.7	107.7	1.7	10.0	2
	5	●	0960S10H05	67.3	81.7	137.7	1.7	10.0	2
9.7	3	●	MDM 0970S10H03	37.3	51.8	107.8	1.8	10.0	2
	5	●	0970S10H05	67.3	81.8	137.8	1.8	10.0	2
9.8	3	●	MDM 0980S10H03	37.1	51.8	107.8	1.8	10.0	2
	5	●	0980S10H05	67.1	81.8	137.8	1.8	10.0	2
9.9	3	●	MDM 0990S10H03	37.0	51.8	107.8	1.8	10.0	2
	5	●	0990S10H05	67.0	81.8	137.8	1.8	10.0	2
10.0	3	●	MDM 1000S10H03	36.8	51.8	107.8	1.8	10.0	2
	5	●	1000S10H05	66.8	81.8	137.8	1.8	10.0	2
10.1	3	●	MDM 1010S11H03	39.2	54.3	117.8	1.8	11.0	2
	5	●	1010S11H05	70.7	85.8	150.8	1.8	11.0	2
10.2	3	●	MDM 1020S11H03	39.1	54.4	117.9	1.9	11.0	2
	5	●	1020S11H05	70.6	85.9	150.9	1.9	11.0	2
10.3	3	●	MDM 1030S11H03	39.0	54.4	117.9	1.9	11.0	2
	5	●	1030S11H05	70.5	85.9	150.9	1.9	11.0	2
10.4	3	●	MDM 1040S11H03	38.8	54.4	117.9	1.9	11.0	2
	5	●	1040S11H05	70.3	85.9	150.9	1.9	11.0	2
10.5	3	●	MDM 1050S11H03	38.7	54.4	117.9	1.9	11.0	2
	5	●	1050S11H05	70.2	85.9	150.9	1.9	11.0	2
10.6	3	●	MDM 1060S11H03	41.0	56.9	117.9	1.9	11.0	2
	5	●	1060S11H05	74.0	89.9	150.9	1.9	11.0	2
10.7	3	●	MDM 1070S11H03	40.9	56.9	117.9	1.9	11.0	2
	5	●	1070S11H05	73.9	89.9	150.9	1.9	11.0	2
10.8	3	●	MDM 1080S11H03	40.8	57.0	118.0	2.0	11.0	2
	5	●	1080S11H05	73.8	90.0	151.0	2.0	11.0	2
10.9	3	●	MDM 1090S11H03	40.7	57.0	118.0	2.0	11.0	2
	5	●	1090S11H05	73.7	90.0	151.0	2.0	11.0	2

Grade: ACT70

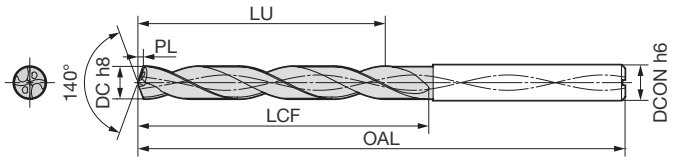
MDM series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron

NX Coat | 3D | 5D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 **Bean Jet Cooling**



Diameter ø11.0 to 12.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
11.0	3	●	MDM 1100S11H03	40.5	57.0	118.0	2.0	11.0	2
	5	●	1100S11H05	73.5	90.0	151.0	2.0	11.0	2
11.1	3	●	MDM 1110S12H03	42.9	59.5	124.0	2.0	12.0	2
	5	●	1110S12H05	77.4	94.0	160.0	2.0	12.0	2
11.2	3	●	MDM 1120S12H03	42.7	59.5	124.0	2.0	12.0	2
	5	●	1120S12H05	77.2	94.0	160.0	2.0	12.0	2
11.3	3	●	MDM 1130S12H03	42.7	59.6	124.1	2.1	12.0	2
	5	●	1130S12H05	77.2	94.1	160.1	2.1	12.0	2
11.4	3	●	MDM 1140S12H03	42.5	59.6	124.1	2.1	12.0	2
	5	●	1140S12H05	77.0	94.1	160.1	2.1	12.0	2
11.5	3	●	MDM 1150S12H03	42.4	59.6	124.1	2.1	12.0	2
	5	●	1150S12H05	76.9	94.1	160.1	2.1	12.0	2
11.6	3	●	MDM 1160S12H03	44.7	62.1	124.1	2.1	12.0	2
	5	●	1160S12H05	80.7	98.1	160.1	2.1	12.0	2
11.7	3	●	MDM 1170S12H03	44.6	62.1	124.1	2.1	12.0	2
	5	●	1170S12H05	80.6	98.1	160.1	2.1	12.0	2
11.8	3	●	MDM 1180S12H03	44.4	62.1	124.1	2.1	12.0	2
	5	●	1180S12H05	80.4	98.1	160.1	2.1	12.0	2
11.9	3	●	MDM 1190S12H03	44.4	62.2	124.2	2.2	12.0	2
	5	●	1190S12H05	80.4	98.2	160.2	2.2	12.0	2
12.0	3	●	MDM 1200S12H03	44.2	62.2	124.2	2.2	12.0	2
	5	●	1200S12H05	80.2	98.2	160.2	2.2	12.0	2
12.1	3	●	MDM 1210S13H03	46.6	64.7	130.2	2.2	13.0	2
	5	●	1210S13H05	84.1	102.2	169.2	2.2	13.0	2
12.2	3	●	MDM 1220S13H03	46.4	64.7	130.2	2.2	13.0	2
	5	●	1220S13H05	83.9	102.2	169.2	2.2	13.0	2
12.3	3	●	MDM 1230S13H03	46.3	64.7	130.2	2.2	13.0	2
	5	●	1230S13H05	83.8	102.2	169.2	2.2	13.0	2
12.4	3	●	MDM 1240S13H03	46.2	64.8	130.3	2.3	13.0	2
	5	●	1240S13H05	83.7	102.3	169.3	2.3	13.0	2
12.5	3	●	MDM 1250S13H03	46.1	64.8	130.3	2.3	13.0	2
	5	●	1250S13H05	83.6	102.3	169.3	2.3	13.0	2
12.6	3	●	MDM 1260S13H03	48.4	67.3	130.3	2.3	13.0	2
	5	●	1260S13H05	87.4	106.3	169.3	2.3	13.0	2
12.7	3	●	MDM 1270S13H03	48.3	67.3	130.3	2.3	13.0	2
	5	●	1270S13H05	87.3	106.3	169.3	2.3	13.0	2
12.8	3	●	MDM 1280S13H03	48.1	67.3	130.3	2.3	13.0	2
	5	●	1280S13H05	87.1	106.3	169.3	2.3	13.0	2
12.9	3	●	MDM 1290S13H03	48.0	67.3	130.3	2.3	13.0	2
	5	●	1290S13H05	87.0	106.3	169.3	2.3	13.0	2

Grade: ACT70

Diameter ø13.0 to 14.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
13.0	3	●	MDM 1300S13H03	47.9	67.4	130.4	2.4	13.0	2
	5	●	1300S13H05	86.9	106.4	169.4	2.4	13.0	2
13.1	3	●	MDM 1310S14H03	50.3	69.9	136.4	2.4	14.0	2
	5	●	1310S14H05	90.8	110.4	178.4	2.4	14.0	2
13.2	3	●	MDM 1320S14H03	50.1	69.9	136.4	2.4	14.0	2
	5	●	1320S14H05	90.6	110.4	178.4	2.4	14.0	2
13.3	3	●	MDM 1330S14H03	50.0	69.9	136.4	2.4	14.0	2
	5	●	1330S14H05	90.5	110.4	178.4	2.4	14.0	2
13.4	3	●	MDM 1340S14H03	49.8	69.9	136.4	2.4	14.0	2
	5	●	1340S14H05	90.3	110.4	178.4	2.4	14.0	2
13.5	3	●	MDM 1350S14H03	49.8	70.0	136.5	2.5	14.0	2
	5	●	1350S14H05	90.3	110.5	178.5	2.5	14.0	2
13.6	3	●	MDM 1360S14H03	52.1	72.5	136.5	2.5	14.0	2
	5	●	1360S14H05	94.1	114.5	178.5	2.5	14.0	2
13.7	3	●	MDM 1370S14H03	52.0	72.5	136.5	2.5	14.0	2
	5	●	1370S14H05	94.0	114.5	178.5	2.5	14.0	2
13.8	3	●	MDM 1380S14H03	51.8	72.5	136.5	2.5	14.0	2
	5	●	1380S14H05	93.8	114.5	178.5	2.5	14.0	2
13.9	3	●	MDM 1390S14H03	51.7	72.5	136.5	2.5	14.0	2
	5	●	1390S14H05	93.7	114.5	178.5	2.5	14.0	2
14.0	3	●	MDM 1400S14H03	51.5	72.5	136.5	2.5	14.0	2
	5	●	1400S14H05	93.5	114.5	178.5	2.5	14.0	2
14.1	3	●	MDM 1410S15H03	54.0	75.1	142.6	2.6	15.0	2
	5	●	1410S15H05	97.5	118.6	187.6	2.6	15.0	2
14.2	3	●	MDM 1420S15H03	53.8	75.1	142.6	2.6	15.0	2
	5	●	1420S15H05	97.3	118.6	187.6	2.6	15.0	2
14.3	3	●	MDM 1430S15H03	53.7	75.1	142.6	2.6	15.0	2
	5	●	1430S15H05	97.2	118.6	187.6	2.6	15.0	2
14.4	3	●	MDM 1440S15H03	53.5	75.1	142.6	2.6	15.0	2
	5	●	1440S15H05	97.0	118.6	187.6	2.6	15.0	2
14.5	3	●	MDM 1450S15H03	53.4	75.1	142.6	2.6	15.0	2
	5	●	1450S15H05	96.9	118.6	187.6	2.6	15.0	2
14.6	3	●	MDM 1460S15H03	55.8	77.7	142.7	2.7	15.0	2
	5	●	1460S15H05	100.8	122.7	187.7	2.7	15.0	2
14.7	3	●	MDM 1470S15H03	55.7	77.7	142.7	2.7	15.0	2
	5	●	1470S15H05	100.7	122.7	187.7	2.7	15.0	2
14.8	3	●	MDM 1480S15H03	55.5	77.7	142.7	2.7	15.0	2
	5	●	1480S15H05	100.5	122.7	187.7	2.7	15.0	2
14.9	3	●	MDM 1490S15H03	55.4	77.7	142.7	2.7	15.0	2
	5	●	1490S15H05	100.4	122.7	187.7	2.7	15.0	2

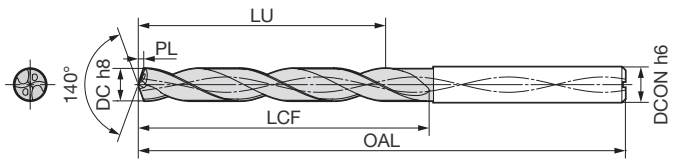
Grade: ACT70

MDM series (Internal Coolant Supply)

NX Coat | 3D | 5D

*Refer to N36 for the tolerance of h6 and h8

Fig 2 **Bean Jet Cooling**



Diameter ø15.0 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
15.0	3	●	MDM 1500S15H03	55.2	77.7	142.7	2.7	15.0	2
	5	●	1500S15H05	100.2	122.7	187.7	2.7	15.0	2
15.1	3	●	MDM 1510S16H03	57.6	80.2	148.7	2.7	16.0	2
	5	●	1510S16H05	104.1	126.7	196.7	2.7	16.0	2
15.2	3	●	MDM 1520S16H03	57.5	80.3	148.8	2.8	16.0	2
	5	●	1520S16H05	104.0	126.8	196.8	2.8	16.0	2
15.3	3	●	MDM 1530S16H03	57.4	80.3	148.8	2.8	16.0	2
	5	●	1530S16H05	103.9	126.8	196.8	2.8	16.0	2
15.4	3	●	MDM 1540S16H03	57.2	80.3	148.8	2.8	16.0	2
	5	●	1540S16H05	103.7	126.8	196.8	2.8	16.0	2
15.5	3	●	MDM 1550S16H03	57.1	80.3	148.8	2.8	16.0	2
	5	●	1550S16H05	103.6	126.8	196.8	2.8	16.0	2
15.6	3	●	MDM 1560S16H03	59.4	82.8	148.8	2.8	16.0	2
	5	●	1560S16H05	107.4	130.8	196.8	2.8	16.0	2
15.7	3	●	MDM 1570S16H03	59.4	82.9	148.9	2.9	16.0	2
	5	●	1570S16H05	107.4	130.9	196.9	2.9	16.0	2
15.8	3	●	MDM 1580S16H03	59.2	82.9	148.9	2.9	16.0	2
	5	●	1580S16H05	107.2	130.9	196.9	2.9	16.0	2
15.9	3	●	MDM 1590S16H03	59.1	82.9	148.9	2.9	16.0	2
	5	●	1590S16H05	107.1	130.9	196.9	2.9	16.0	2
16.0	3	●	MDM 1600S16H03	58.9	82.9	148.9	2.9	16.0	2
	5	●	1600S16H05	106.9	130.9	196.9	2.9	16.0	2

Grade: ACT70

Metals Symbols Chart

Work Material	Hardness	Japanese Industrial Standards JIS	International Standard ISO 15510	European Standards EN	US Standards AISI
Ferritic/ Martensitic Stainless Steel	≤ 200HB	SUS405	X6CrAl13	1.4002	405
		SUS410	X12Cr13	1.4006	410
		SUS410S	X6Cr13	1.4000	-
		SUS430	X6Cr17	1.4016	430
		SUS434	X6CrMo17-1	1.4113	434
	> 200HB	SUS420J1	X20Cr13	1.4021	420
		SUS420J2	X30Cr13	1.4028	420
		SUS431	X17CrNi16-2	1.4057	431
Austenitic Stainless Steel	≤ 200HB	SUS304	X5CrNi18-10	1.4301	304
		SUS305	X6CrNi18-12	1.4303	305
		SUS303	X10CrNiS18-9	1.4305	303
		SUS304L	X2CrNi18-9	1.4307	304L
		SUS316	X5CrNiMo17-12-2	1.4401	316
		SUS316L	X2CrNiMo17-12-2	1.4404	316L
		SUS317L	X2CrNiMo19-14-4	1.4438	317L
		SUS321	X6CrNiTi18-10	1.4541	321
		SUS347	X6CrNiNb18-10	1.4550	347
		SUS316Ti	X6CrNiMoTi17-12-2	1.4571	-
		SUS309S	X6CrNi23-13	1.4950	309S
		SUS310S	X6CrNi25-20	1.4951	310S
	> 200HB	SUS304N1	X5CrNiN19-9	1.4315	304N
		SUS301	X5CrNi17-7	1.4319	301
		SUS301L	X2CrNiN18-7	1.4318	-
Stainless Steel with Deposition Hardened Structure	≤ 340HB	SUS630	X5CrNiCuNb16-4	1.4542	17-4PH (S17400)
		-	-	-	15-5PH (S15500)
		SUS631	X7CrNiAl17-7	1.4568	17-7PH (S17700)
Duplex Stainless Steel	≤ 310HB	SUS329J1	X6CrNiMo26-4-2	-	329
		SUS329J3L	X2CrNiMoN22-5-3	1.4462	-
		SUS329J4L	X2CrNiMoN25-7-3	-	-

MDM series (Internal Coolant Supply)

Recommended Cutting Conditions

1. The recommended cutting conditions below are for cases where an internal supply of a water soluble coolant is used.
2. If using non-water-soluble coolant, reduce the cutting speed by 20-30% and ensure that sufficient coolant is supplied.
3. When mounting the drill in the collet, make sure that runout around the cutting edge is no greater than 0.02mm.
4. Make sure the flute does not enter the collet.
5. If the surface of the workpiece is abnormally shaped (tilted, interrupted etc.), reduce the feed rate to about half when feeding the drill in the workpiece.
   *If stable drilling is still not possible, pre-drilling of a flat surface with a Flat MULTIDRILL MDF series drill is recommended.
6. When performing interrupted through drilling, reduce the feed rate to about half the feed rate used prior to this process.

Work Material	Ferritic/Martensitic Stainless Steel				Austenitic Stainless Steel			
	≤ 200HB		> 200HB		≤ 200HB		> 200HB	
Cutting Speed	60 to 100m/min		40 to 80m/min		60 to 100m/min		40 to 80m/min	
Diameter DC (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)
ø3	8,500	0.06 to 0.12	6,400	0.06 to 0.12	8,500	0.06 to 0.12	6,400	0.06 to 0.12
ø4	6,400	0.08 to 0.17	4,800	0.08 to 0.17	6,400	0.08 to 0.17	4,800	0.08 to 0.17
ø5	5,100	0.08 to 0.20	3,900	0.08 to 0.20	5,100	0.08 to 0.20	3,900	0.08 to 0.20
ø6	4,300	0.10 to 0.20	3,200	0.10 to 0.20	4,300	0.10 to 0.20	3,200	0.10 to 0.20
ø7	3,700	0.12 to 0.23	2,800	0.12 to 0.23	3,700	0.12 to 0.23	2,800	0.12 to 0.23
ø8	3,200	0.15 to 0.25	2,400	0.15 to 0.25	3,200	0.15 to 0.25	2,400	0.15 to 0.25
ø9	2,900	0.17 to 0.25	2,200	0.17 to 0.25	2,900	0.17 to 0.25	2,200	0.17 to 0.25
ø10	2,600	0.18 to 0.28	2,000	0.18 to 0.28	2,600	0.18 to 0.28	2,000	0.18 to 0.28
ø11	2,400	0.20 to 0.30	1,800	0.20 to 0.30	2,400	0.20 to 0.30	1,800	0.20 to 0.30
ø12	2,200	0.20 to 0.30	1,600	0.20 to 0.30	2,200	0.20 to 0.30	1,600	0.20 to 0.30
ø13	2,000	0.20 to 0.30	1,500	0.20 to 0.30	2,000	0.20 to 0.30	1,500	0.20 to 0.30
ø14	1,900	0.20 to 0.30	1,400	0.20 to 0.30	1,900	0.20 to 0.30	1,400	0.20 to 0.30
ø15	1,700	0.20 to 0.30	1,300	0.20 to 0.30	1,700	0.20 to 0.30	1,300	0.20 to 0.30
ø16	1,600	0.20 to 0.30	1,200	0.20 to 0.30	1,600	0.20 to 0.30	1,200	0.20 to 0.30

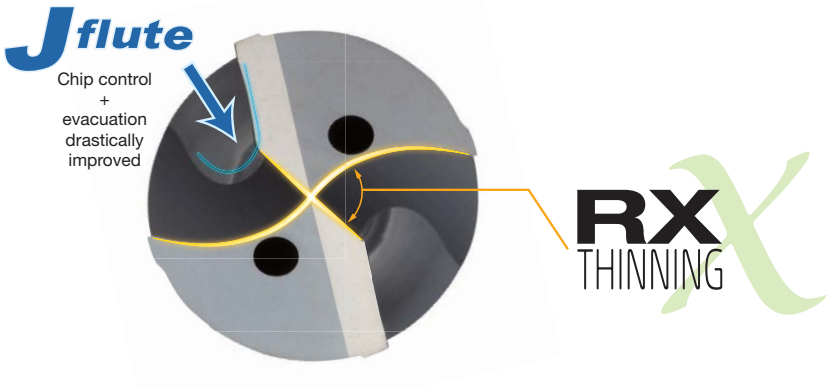
Work Material	Stainless Steel with Deposition Hardened Structure ≤ 340HB		Duplex Stainless Steel ≤ 310HB		Titanium Alloy 260HB to 340HB		Ni-based heat resistant alloy (Inconel 718) 38 to 45HRC	
Cutting Speed	40 to 60m/min		40 to 60m/min		30 to 50m/min		10 to 30m/min	
Diameter DC (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)
ø3	5,300	0.06 to 0.12	5,300	0.06 to 0.12	4,200	0.06 to 0.12	2,100	0.05 to 0.08
ø4	4,000	0.08 to 0.17	4,000	0.08 to 0.17	3,200	0.08 to 0.17	1,600	0.06 to 0.10
ø5	3,200	0.08 to 0.20	3,200	0.08 to 0.20	2,500	0.08 to 0.20	1,250	0.07 to 0.12
ø6	2,700	0.10 to 0.20	2,700	0.10 to 0.20	2,100	0.10 to 0.20	1,050	0.08 to 0.15
ø7	2,300	0.12 to 0.23	2,300	0.12 to 0.23	1,800	0.12 to 0.23	900	0.08 to 0.15
ø8	2,000	0.15 to 0.25	2,000	0.15 to 0.25	1,600	0.15 to 0.25	800	0.10 to 0.18
ø9	1,800	0.17 to 0.25	1,800	0.17 to 0.25	1,400	0.17 to 0.25	700	0.12 to 0.18
ø10	1,600	0.18 to 0.28	1,600	0.18 to 0.28	1,300	0.18 to 0.28	650	0.12 to 0.18
ø11	1,400	0.20 to 0.30	1,400	0.20 to 0.30	1,200	0.20 to 0.30	600	0.15 to 0.20
ø12	1,300	0.20 to 0.30	1,300	0.20 to 0.30	1,100	0.20 to 0.30	550	0.15 to 0.20
ø13	1,200	0.20 to 0.30	1,200	0.20 to 0.30	1,000	0.20 to 0.30	500	0.15 to 0.20
ø14	1,100	0.20 to 0.30	1,100	0.20 to 0.30	900	0.20 to 0.30	450	0.15 to 0.20
ø15	1,050	0.20 to 0.30	1,050	0.20 to 0.30	850	0.20 to 0.30	420	0.15 to 0.20
ø16	1,000	0.20 to 0.30	1,000	0.20 to 0.30	800	0.20 to 0.30	400	0.15 to 0.20

MEMO

HX series

■ General Features

Strong MULTIDRILL HX series is a special drill for cast iron that combines reduced cutting force and improved drill strength to achieve stable and high efficiency drilling of cast iron.



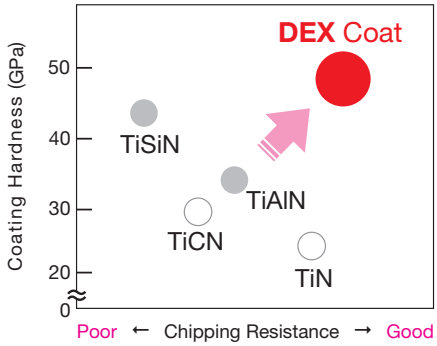
■ Features and Applications

● High-efficiency Drilling of Cast Iron

Thick web and special double margin design ensure stable behaviour even in high-efficiency drilling.
Furthermore, RX THINNING drastically reduces cutting force and ensures more stable and efficient drilling.
Enables high-efficiency drilling at feed rates of over vf=1,000mm/min. (for ø10mm sizes)

● Long Tool Life

DEX Coat for drills utilises nano-coating technology that provides more than double the tool life of conventional coatings. The drill guide function is enhanced through optimisation of the margin position to prevent breakage due to hole bending.

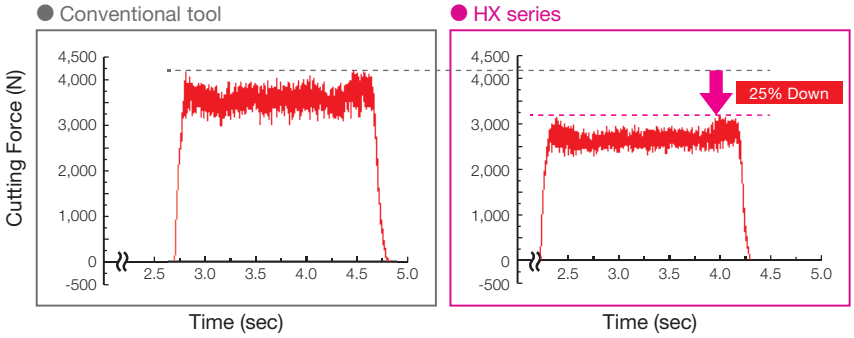


Low Resistance Wide chip pocket reduces thrust resistance.

RX THINNING

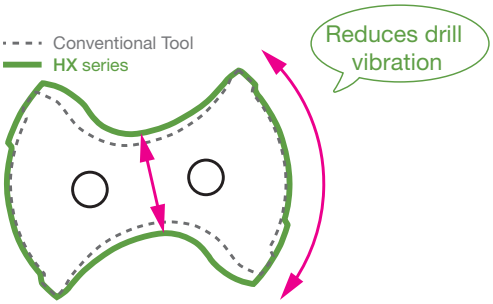
Improves tool load

Also suitable for small machining centres

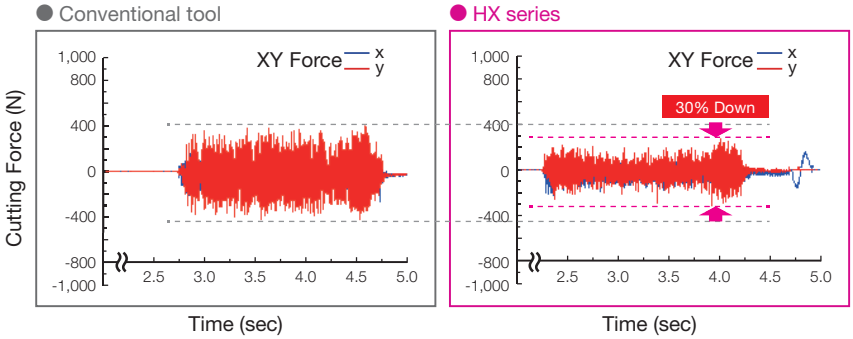


Work Material : FC250, Tool: Conventional tool, MDW 1250HX5 (ø12.5mm 5D)
Cutting Conditions : vc = 100m/min, f = 0.60mm/rev, H = 50mm, Internal Coolant Supply (water soluble)

High Rigidity Combination of large web thickness and wide land reduces vibration.



Reduces drill vibration



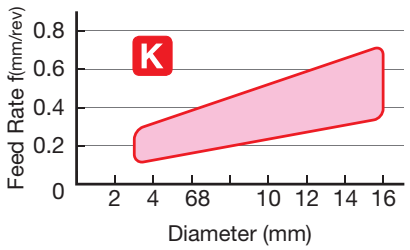
Work Material : FC250, Tool: Conventional tool, MDW 1250HX5 (ø12.5mm 5D)
Cutting Conditions: vc = 100m/min, f = 0.60mm/rev, H = 50mm, Internal Coolant Supply (water soluble)

HX series

■ Product Range

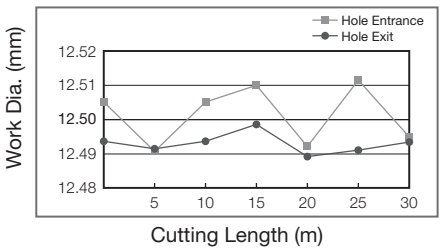
Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Number of items
Internal	MDW□□□□HX3	ø3.0 to ø20.0	up to 3	108 items in stock
	MDW□□□□HX5	ø3.0 to ø20.0	up to 5	108 items in stock
	MDW□□□□HX8	ø3.0 to ø18.0	up to 8	32 items in stock

● Drilling of grey cast iron

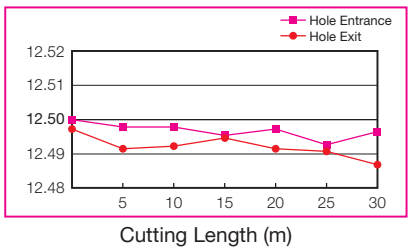


High-precision Improved margin tip position improves drilling precision.

● Conventional tool



● HX series



Work Material : FC250, Tool: Conventional Tool, MDW 1250HX5 (ø12.5mm 5D)
Cutting Conditions : vc = 100m/min, f = 0.60mm/rev, H = 50mm, Internal Coolant Supply (water soluble)

Longer Tool Life High-feed drilling reduces margin wear and extends tool life.
→ Maintains replacement frequency (drilling time) and enables high-efficiency drilling.

● Conventional tool

Cutting Conditions: f =0.30mm/rev Cutting Length: 30m (drilling time 39 minutes)

● HX series

Cutting Conditions: f =0.30mm/rev Cutting Length: 30m (drilling time 39 minutes)

Cutting Conditions: f =0.60mm/rev Cutting Length: 60m (drilling time 39 minutes)

Work Material : FC250, Tool: Conventional tool, MDW 1250HX5 (ø12.5mm 5D)
Cutting Conditions : vc = 100m/min, f = 0.60mm/rev, H = 50mm, Internal Coolant Supply (water soluble)

Double the feed

■ Application Examples

Machine Component (**FC250**)
·Tool: MDW 1850HX5 (ø18.5mm 5D)
·Drilling Distance: 50m
·Cutting Conditions: vc = 70m/min, f = 0.9mm/rev, H = 27mm (blind), Internal Coolant Supply (water soluble)

Reduced cutting edge wear in ultra-high-speed drilling.

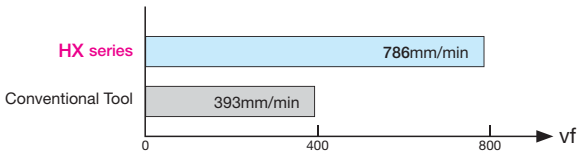
Cutting Edge Rake Face Condition after Preset Tool Life

Competitor's High-efficiency Drill

HX series

Equipment Component (**FCD450**)
·Tool: MDW 0850HX5 (ø8.5mm 5D)
·Drilling Distance: 60m
·Cutting Conditions: vc = 70m/min, f = 0.30mm/rev, vf=786mm/min, H = 27mm (blind), Internal Coolant Supply (water soluble)

Double the drilling efficiency of conventional tools.



Engine Component (**FCD700**)
·Tool: MDW 1200HX3 (ø12.0mm 3D)
·Drilling Distance: 60m
·Cutting Conditions: Conventional Tool: vc = 50m/min, f = 0.22mm/rev, vf = 291.7mm/min
HX series: vc = 50m/min, f = 0.40mm/rev, vf = 530.4mm/min
H = 28mm (blind), Internal Coolant Supply (water soluble)

Stable drilling performance with 1.8 times the efficiency of conventional tools.

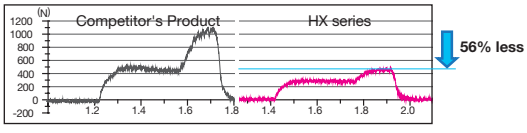
Cutting Edge Wear Comparison after Fixed Tool Life

Conventional Tool (f = **0.22**mm/rev)

HX series (f = **0.40**mm/rev)

Machine Component (Sintered Material)
·Tool: MDW 0570HX3
·Cutting Conditions: vc = 70m/min, f = 0.9mm/rev, H = 27mm (blind), Internal Coolant Supply (water soluble)

Less cutting force and edge chipping than competitor's products.



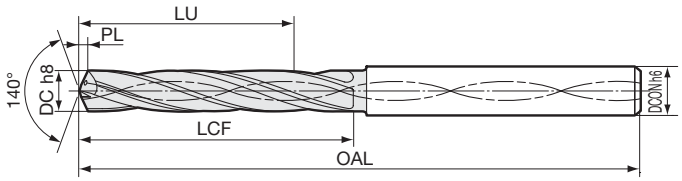
HX series (Internal Coolant Supply)

Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø3.0 to 4.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	MDW 0300HX3	13.5	18.0	68.5	0.5	3.0	1
	5	●	0300HX5	24.0	28.5	78.5	0.5	3.0	1
	8	●	0300HX8	29.0	33.5	81.5	0.5	3.0	1
3.1	3	●	MDW 0310HX3	16.0	20.6	72.6	0.6	4.0	1
	5	●	0310HX5	28.0	32.6	86.6	0.6	4.0	1
	8		0310HX8	34.5	39.1	92.6	0.6	4.0	1
3.2	3	●	MDW 0320HX3	15.8	20.6	72.6	0.6	4.0	1
	5	●	0320HX5	27.8	32.6	86.6	0.6	4.0	1
	8		0320HX8	34.3	39.1	92.6	0.6	4.0	1
3.3	3	●	MDW 0330HX3	15.7	20.6	72.6	0.6	4.0	1
	5	●	0330HX5	27.7	32.6	86.6	0.6	4.0	1
	8		0330HX8	34.2	39.1	92.6	0.6	4.0	1
3.4	3	●	MDW 0340HX3	15.5	20.6	72.6	0.6	4.0	1
	5	●	0340HX5	27.5	32.6	86.6	0.6	4.0	1
	8		0340HX8	34.0	39.1	92.6	0.6	4.0	1
3.5	3	●	MDW 0350HX3	15.4	20.6	72.6	0.6	4.0	1
	5	●	0350HX5	27.4	32.6	86.6	0.6	4.0	1
	8	●	0350HX8	33.9	39.1	92.6	0.6	4.0	1
3.6	3	●	MDW 0360HX3	17.8	23.2	72.7	0.7	4.0	1
	5	●	0360HX5	31.3	36.7	86.7	0.7	4.0	1
	8		0360HX8	39.3	44.7	92.7	0.7	4.0	1
3.7	3	●	MDW 0370HX3	17.7	23.2	72.7	0.7	4.0	1
	5	●	0370HX5	31.2	36.7	86.7	0.7	4.0	1
	8		0370HX8	39.2	44.7	92.7	0.7	4.0	1
3.8	3	●	MDW 0380HX3	17.5	23.2	72.7	0.7	4.0	1
	5	●	0380HX5	31.0	36.7	86.7	0.7	4.0	1
	8		0380HX8	39.0	44.7	92.7	0.7	4.0	1
3.9	3	●	MDW 0390HX3	17.4	23.2	72.7	0.7	4.0	1
	5	●	0390HX5	30.9	36.7	86.7	0.7	4.0	1
	8		0390HX8	38.9	44.7	92.7	0.7	4.0	1
4.0	3	●	MDW 0400HX3	17.2	23.2	72.7	0.7	4.0	1
	5	●	0400HX5	30.7	36.7	86.7	0.7	4.0	1
	8	●	0400HX8	38.7	44.7	92.7	0.7	4.0	1
4.1	3	●	MDW 0410HX3	19.6	25.7	80.7	0.7	5.0	1
	5	●	0410HX5	34.6	40.7	98.7	0.7	5.0	1
	8		0410HX8	44.1	50.2	105.7	0.7	5.0	1
4.2	3	●	MDW 0420HX3	19.5	25.8	80.8	0.8	5.0	1
	5	●	0420HX5	34.5	40.8	98.8	0.8	5.0	1
	8		0420HX8	44.0	50.3	105.8	0.8	5.0	1
4.3	3	●	MDW 0430HX3	19.4	25.8	80.8	0.8	5.0	1
	5	●	0430HX5	34.4	40.8	98.8	0.8	5.0	1
	8		0430HX8	43.9	50.3	105.8	0.8	5.0	1
4.4	3	●	MDW 0440HX3	19.2	25.8	80.8	0.8	5.0	1
	5	●	0440HX5	34.2	40.8	98.8	0.8	5.0	1
	8		0440HX8	43.7	50.3	105.8	0.8	5.0	1
4.5	3	●	MDW 0450HX3	19.1	25.8	80.8	0.8	5.0	1
	5	●	0450HX5	34.1	40.8	98.8	0.8	5.0	1
	8	●	0450HX8	43.6	50.3	105.8	0.8	5.0	1
4.6	3	●	MDW 0460HX3	21.4	28.3	80.8	0.8	5.0	1
	5	●	0460HX5	37.9	44.8	98.8	0.8	5.0	1
	8		0460HX8	48.9	55.8	105.8	0.8	5.0	1
4.7	3	●	MDW 0470HX3	21.4	28.4	80.9	0.9	5.0	1
	5	●	0470HX5	37.9	44.9	98.9	0.9	5.0	1
	8		0470HX8	48.9	55.9	105.9	0.9	5.0	1

Grade: ACX70

Diameter ø4.8 to 6.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.8	3	●	MDW 0480HX3	21.2	28.4	80.9	0.9	5.0	1
	5	●	0480HX5	37.7	44.9	98.9	0.9	5.0	1
	8		0480HX8	48.7	55.9	105.9	0.9	5.0	1
4.9	3	●	MDW 0490HX3	21.1	28.4	80.9	0.9	5.0	1
	5	●	0490HX5	37.6	44.9	98.9	0.9	5.0	1
	8		0490HX8	48.6	55.9	105.9	0.9	5.0	1
5.0	3	●	MDW 0500HX3	20.9	28.4	80.9	0.9	5.0	1
	5	●	0500HX5	37.4	44.9	98.9	0.9	5.0	1
	8	●	0500HX8	48.4	55.9	105.9	0.9	5.0	1
5.1	3	●	MDW 0510HX3	20.8	28.4	82.9	0.9	6.0	1
	5	●	0510HX5	37.3	44.9	100.9	0.9	6.0	1
	8	●	0510HX8	53.8	61.4	118.9	0.9	6.0	1
5.2	3	●	MDW 0520HX3	20.6	28.4	82.9	0.9	6.0	1
	5	●	0520HX5	37.1	44.9	100.9	0.9	6.0	1
	8		0520HX8	53.6	61.4	118.9	0.9	6.0	1
5.3	3	●	MDW 0530HX3	20.6	28.5	83.0	1.0	6.0	1
	5	●	0530HX5	37.1	45.0	101.0	1.0	6.0	1
	8		0530HX8	53.6	61.5	119.0	1.0	6.0	1
5.4	3	●	MDW 0540HX3	20.4	28.5	83.0	1.0	6.0	1
	5	●	0540HX5	36.9	45.0	101.0	1.0	6.0	1
	8		0540HX8	53.4	61.5	119.0	1.0	6.0	1
5.5	3	●	MDW 0550HX3	20.3	28.5	83.0	1.0	6.0	1
	5	●	0550HX5	36.8	45.0	101.0	1.0	6.0	1
	8	●	0550HX8	53.3	61.5	119.0	1.0	6.0	1
5.6	3	●	MDW 0560HX3	22.6	31.0	83.0	1.0	6.0	1
	5	●	0560HX5	40.6	49.0	101.0	1.0	6.0	1
	8		0560HX8	58.6	67.0	119.0	1.0	6.0	1
5.7	3	●	MDW 0570HX3	22.5	31.0	83.0	1.0	6.0	1
	5	●	0570HX5	40.5	49.0	101.0	1.0	6.0	1
	8		0570HX8	58.5	67.0	119.0	1.0	6.0	1
5.8	3	●	MDW 0580HX3	22.4	31.1	83.1	1.1	6.0	1
	5	●	0580HX5	40.4	49.1	101.1	1.1	6.0	1
	8	●	0580HX8	58.4	67.1	119.1	1.1	6.0	1
5.9	3	●	MDW 0590HX3	22.3	31.1	83.1	1.1	6.0	1
	5	●	0590HX5	40.3	49.1	101.1	1.1	6.0	1
	8	●	0590HX8	58.3	67.1	119.1	1.1	6.0	1
6.0	3	●	MDW 0600HX3	22.1	31.1	83.1	1.1	6.0	1
	5	●	0600HX5	40.1	49.1	101.1	1.1	6.0	1
	8	●	0600HX8	58.1	67.1	119.1	1.1	6.0	1
6.1	3	●	MDW 0610HX3	24.5	33.6	89.1	1.1	7.0	1
	5	●	0610HX5	44.0	53.1	110.1	1.1	7.0	1
	8		0610HX8	63.5	72.6	131.1	1.1	7.0	1
6.2	3	●	MDW 0620HX3	24.3	33.6	89.1	1.1	7.0	1
	5	●	0620HX5	43.8	53.1	110.1	1.1	7.0	1
	8		0620HX8	63.3	72.6	131.1	1.1	7.0	1
6.3	3	●	MDW 0630HX3	24.2	33.6	89.1	1.1	7.0	1
	5	●	0630HX5	43.7	53.1	110.1	1.1	7.0	1
	8		0630HX8	63.2	72.6	131.1	1.1	7.0	1
6.4	3	●	MDW 0640HX3	24.1	33.7	89.2	1.2	7.0	1
	5	●	0640HX5	43.6	53.2	110.2	1.2	7.0	1
	8		0640HX8	63.1	72.7	131.2	1.2	7.0	1
6.5	3	●	MDW 0650HX3	24.0	33.7	89.2	1.2	7.0	1
	5	●	0650HX5	43.5	53.2	110.2	1.2	7.0	1
	8	●	0650HX8	63.0	72.7	131.2	1.2	7.0	1

Grade: ACX70

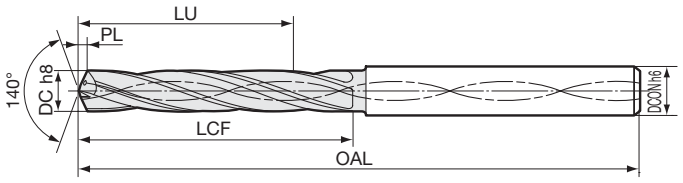
HX series (Internal Coolant Supply)

Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø6.6 to 8.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.6	3	●	MDW 0660HX3	26.3	36.2	89.2	1.2	7.0	1
	5	●	0660HX5	47.3	57.2	110.2	1.2	7.0	1
	8		0660HX8	68.3	78.2	131.2	1.2	7.0	1
6.7	3	●	MDW 0670HX3	26.2	36.2	89.2	1.2	7.0	1
	5	●	0670HX5	47.2	57.2	110.2	1.2	7.0	1
	8	●	0670HX8	68.2	78.2	131.2	1.2	7.0	1
6.8	3	●	MDW 0680HX3	26.0	36.2	89.2	1.2	7.0	1
	5	●	0680HX5	47.0	57.2	110.2	1.2	7.0	1
	8	●	0680HX8	68.0	78.2	131.2	1.2	7.0	1
6.9	3	●	MDW 0690HX3	26.0	36.3	89.3	1.3	7.0	1
	5	●	0690HX5	47.0	57.3	110.3	1.3	7.0	1
	8	●	0690HX8	68.0	78.3	131.3	1.3	7.0	1
7.0	3	●	MDW 0700HX3	25.8	36.3	89.3	1.3	7.0	1
	5	●	0700HX5	46.8	57.3	110.3	1.3	7.0	1
	8	●	0700HX8	67.8	78.3	131.3	1.3	7.0	1
7.1	3	●	MDW 0710HX3	28.2	38.8	95.3	1.3	8.0	1
	5	●	0710HX5	50.7	61.3	119.3	1.3	8.0	1
	8		0710HX8	73.2	83.8	143.3	1.3	8.0	1
7.2	3	●	MDW 0720HX3	28.0	38.8	95.3	1.3	8.0	1
	5	●	0720HX5	50.5	61.3	119.3	1.3	8.0	1
	8		0720HX8	73.0	83.8	143.3	1.3	8.0	1
7.3	3	●	MDW 0730HX3	27.9	38.8	95.3	1.3	8.0	1
	5	●	0730HX5	50.4	61.3	119.3	1.3	8.0	1
	8		0730HX8	72.9	83.8	143.3	1.3	8.0	1
7.4	3	●	MDW 0740HX3	27.7	38.8	95.3	1.3	8.0	1
	5	●	0740HX5	50.2	61.3	119.3	1.3	8.0	1
	8		0740HX8	72.7	83.8	143.3	1.3	8.0	1
7.5	3	●	MDW 0750HX3	27.7	38.9	95.4	1.4	8.0	1
	5	●	0750HX5	50.2	61.4	119.4	1.4	8.0	1
	8	●	0750HX8	72.7	83.9	143.4	1.4	8.0	1
7.6	3	●	MDW 0760HX3	30.0	41.4	95.4	1.4	8.0	1
	5	●	0760HX5	54.0	65.4	119.4	1.4	8.0	1
	8		0760HX8	78.0	89.4	143.4	1.4	8.0	1
7.7	3	●	MDW 0770HX3	29.9	41.4	95.4	1.4	8.0	1
	5	●	0770HX5	53.9	65.4	119.4	1.4	8.0	1
	8		0770HX8	77.9	89.4	143.4	1.4	8.0	1
7.8	3	●	MDW 0780HX3	29.7	41.4	95.4	1.4	8.0	1
	5	●	0780HX5	53.7	65.4	119.4	1.4	8.0	1
	8		0780HX8	77.7	89.4	143.4	1.4	8.0	1
7.9	3	●	MDW 0790HX3	29.6	41.4	95.4	1.4	8.0	1
	5	●	0790HX5	53.6	65.4	119.4	1.4	8.0	1
	8		0790HX8	77.6	89.4	143.4	1.4	8.0	1
8.0	3	●	MDW 0800HX3	29.5	41.5	95.5	1.5	8.0	1
	5	●	0800HX5	53.5	65.5	119.5	1.5	8.0	1
	8	●	0800HX8	77.5	89.5	143.5	1.5	8.0	1
8.1	3	●	MDW 0810HX3	31.9	44.0	101.5	1.5	9.0	1
	5	●	0810HX5	57.4	69.5	128.5	1.5	9.0	1
	8		0810HX8	82.9	95.0	155.5	1.5	9.0	1
8.2	3	●	MDW 0820HX3	31.7	44.0	101.5	1.5	9.0	1
	5	●	0820HX5	57.2	69.5	128.5	1.5	9.0	1
	8		0820HX8	82.7	95.0	155.5	1.5	9.0	1
8.3	3	●	MDW 0830HX3	31.6	44.0	101.5	1.5	9.0	1
	5	●	0830HX5	57.1	69.5	128.5	1.5	9.0	1
	8		0830HX8	82.6	95.0	155.5	1.5	9.0	1

Grade: ACX70

Diameter ø8.4 to 10.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.4	3	●	MDW 0840HX3	31.4	44.0	101.5	1.5	9.0	1
	5	●	0840HX5	56.9	69.5	128.5	1.5	9.0	1
	8		0840HX8	82.4	95.0	155.5	1.5	9.0	1
8.5	3	●	MDW 0850HX3	31.3	44.0	101.5	1.5	9.0	1
	5	●	0850HX5	56.8	69.5	128.5	1.5	9.0	1
	8	●	0850HX8	82.3	95.0	155.5	1.5	9.0	1
8.6	3	●	MDW 0860HX3	33.7	46.6	101.6	1.6	9.0	1
	5	●	0860HX5	60.7	73.6	128.6	1.6	9.0	1
	8		0860HX8	87.7	100.6	155.6	1.6	9.0	1
8.7	3	●	MDW 0870HX3	33.6	46.6	101.6	1.6	9.0	1
	5	●	0870HX5	60.6	73.6	128.6	1.6	9.0	1
	8		0870HX8	87.6	100.6	155.6	1.6	9.0	1
8.8	3	●	MDW 0880HX3	33.4	46.6	101.6	1.6	9.0	1
	5	●	0880HX5	60.4	73.6	128.6	1.6	9.0	1
	8	●	0880HX8	87.4	100.6	155.6	1.6	9.0	1
8.9	3	●	MDW 0890HX3	33.3	46.6	101.6	1.6	9.0	1
	5	●	0890HX5	60.3	73.6	128.6	1.6	9.0	1
	8		0890HX8	87.3	100.6	155.6	1.6	9.0	1
9.0	3	●	MDW 0900HX3	33.1	46.6	101.6	1.6	9.0	1
	5	●	0900HX5	60.1	73.6	128.6	1.6	9.0	1
	8	●	0900HX8	87.1	100.6	155.6	1.6	9.0	1
9.1	3	●	MDW 0910HX3	35.6	49.2	107.7	1.7	10.0	1
	5	●	0910HX5	64.1	77.7	137.7	1.7	10.0	1
	8		0910HX8	92.6	106.2	167.7	1.7	10.0	1
9.2	3	●	MDW 0920HX3	35.4	49.2	107.7	1.7	10.0	1
	5	●	0920HX5	63.9	77.7	137.7	1.7	10.0	1
	8		0920HX8	92.4	106.2	167.7	1.7	10.0	1
9.3	3	●	MDW 0930HX3	35.3	49.2	107.7	1.7	10.0	1
	5	●	0930HX5	63.8	77.7	137.7	1.7	10.0	1
	8		0930HX8	92.3	106.2	167.7	1.7	10.0	1
9.4	3	●	MDW 0940HX3	35.1	49.2	107.7	1.7	10.0	1
	5	●	0940HX5	63.6	77.7	137.7	1.7	10.0	1
	8		0940HX8	92.1	106.2	167.7	1.7	10.0	1
9.5	3	●	MDW 0950HX3	35.0	49.2	107.7	1.7	10.0	1
	5	●	0950HX5	63.5	77.7	137.7	1.7	10.0	1
	8	●	0950HX8	92.0	106.2	167.7	1.7	10.0	1
9.6	3	●	MDW 0960HX3	37.3	51.7	107.7	1.7	10.0	1
	5	●	0960HX5	67.3	81.7	137.7	1.7	10.0	1
	8		0960HX8	97.3	111.7	167.7	1.7	10.0	1
9.7	3	●	MDW 0970HX3	37.3	51.8	107.8	1.8	10.0	1
	5	●	0970HX5	67.3	81.8	137.8	1.8	10.0	1
	8		0970HX8	97.3	111.8	167.8	1.8	10.0	1
9.8	3	●	MDW 0980HX3	37.1	51.8	107.8	1.8	10.0	1
	5	●	0980HX5	67.1	81.8	137.8	1.8	10.0	1
	8		0980HX8	97.1	111.8	167.8	1.8	10.0	1
9.9	3	●	MDW 0990HX3	37.0	51.8	107.8	1.8	10.0	1
	5	●	0990HX5	67.0	81.8	137.8	1.8	10.0	1
	8		0990HX8	97.0	111.8	167.8	1.8	10.0	1
10.0	3	●	MDW 1000HX3	36.8	51.8	107.8	1.8	10.0	1
	5	●	1000HX5	66.8	81.8	137.8	1.8	10.0	1
	8	●	1000HX8	96.8	111.8	167.8	1.8	10.0	1
10.1	3	●	MDW 1010HX3	39.2	54.3	117.8	1.8	11.0	1
	5	●	1010HX5	70.7	85.8	150.8	1.8	11.0	1
	8		1010HX8	102.2	117.3	183.8	1.8	11.0	1

Grade: ACX70

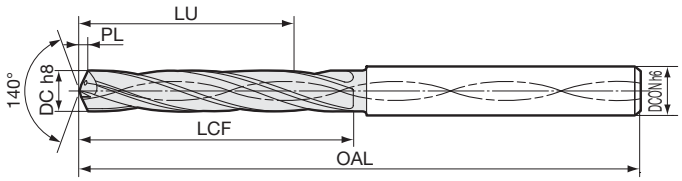
HX series (Internal Coolant Supply)

Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø10.2 to 11.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.2	3	●	MDW 1020HX3	39.1	54.4	117.9	1.9	11.0	1
	5	●	1020HX5	70.6	85.9	150.9	1.9	11.0	1
	8		1020HX8	102.1	117.4	183.9	1.9	11.0	1
10.3	3	●	MDW 1030HX3	39.0	54.4	117.9	1.9	11.0	1
	5	●	1030HX5	70.5	85.9	150.9	1.9	11.0	1
	8	●	1030HX8	102.0	117.4	183.9	1.9	11.0	1
10.4	3	●	MDW 1040HX3	38.8	54.4	117.9	1.9	11.0	1
	5	●	1040HX5	70.3	85.9	150.9	1.9	11.0	1
	8		1040HX8	101.8	117.4	183.9	1.9	11.0	1
10.5	3	●	MDW 1050HX3	38.7	54.4	117.9	1.9	11.0	1
	5	●	1050HX5	70.2	85.9	150.9	1.9	11.0	1
	8	●	1050HX8	101.7	117.4	183.9	1.9	11.0	1
10.6	3	●	MDW 1060HX3	41.0	56.9	117.9	1.9	11.0	1
	5	●	1060HX5	74.0	89.9	150.9	1.9	11.0	1
	8		1060HX8	107.0	122.9	183.9	1.9	11.0	1
10.7	3	●	MDW 1070HX3	40.9	56.9	117.9	1.9	11.0	1
	5	●	1070HX5	73.9	89.9	150.9	1.9	11.0	1
	8		1070HX8	106.9	122.9	183.9	1.9	11.0	1
10.8	3	●	MDW 1080HX3	40.8	57.0	118.0	2.0	11.0	1
	5	●	1080HX5	73.8	90.0	151.0	2.0	11.0	1
	8		1080HX8	106.8	123.0	184.0	2.0	11.0	1
10.9	3	●	MDW 1090HX3	40.7	57.0	118.0	2.0	11.0	1
	5	●	1090HX5	73.7	90.0	151.0	2.0	11.0	1
	8		1090HX8	106.7	123.0	184.0	2.0	11.0	1
11.0	3	●	MDW 1100HX3	40.5	57.0	118.0	2.0	11.0	1
	5	●	1100HX5	73.5	90.0	151.0	2.0	11.0	1
	8	●	1100HX8	106.5	123.0	184.0	2.0	11.0	1
11.1	3	●	MDW 1110HX3	42.9	59.5	124.0	2.0	12.0	1
	5	●	1110HX5	77.4	94.0	160.0	2.0	12.0	1
	8		1110HX8	111.9	128.5	196.0	2.0	12.0	1
11.2	3	●	MDW 1120HX3	42.7	59.5	124.0	2.0	12.0	1
	5	●	1120HX5	77.2	94.0	160.0	2.0	12.0	1
	8		1120HX8	111.7	128.5	196.0	2.0	12.0	1
11.3	3	●	MDW 1130HX3	42.7	59.6	124.1	2.1	12.0	1
	5	●	1130HX5	77.2	94.1	160.1	2.1	12.0	1
	8		1130HX8	111.7	128.6	196.1	2.1	12.0	1
11.4	3	●	MDW 1140HX3	42.5	59.6	124.1	2.1	12.0	1
	5	●	1140HX5	77.0	94.1	160.1	2.1	12.0	1
	8		1140HX8	111.5	128.6	196.1	2.1	12.0	1
11.5	3	●	MDW 1150HX3	42.4	59.6	124.1	2.1	12.0	1
	5	●	1150HX5	76.9	94.1	160.1	2.1	12.0	1
	8	●	1150HX8	111.4	128.6	196.1	2.1	12.0	1
11.6	3	●	MDW 1160HX3	44.7	62.1	124.1	2.1	12.0	1
	5	●	1160HX5	80.7	98.1	160.1	2.1	12.0	1
	8		1160HX8	116.7	134.1	196.1	2.1	12.0	1
11.7	3	●	MDW 1170HX3	44.6	62.1	124.1	2.1	12.0	1
	5	●	1170HX5	80.6	98.1	160.1	2.1	12.0	1
	8		1170HX8	116.6	134.1	196.1	2.1	12.0	1
11.8	3	●	MDW 1180HX3	44.4	62.1	124.1	2.1	12.0	1
	5	●	1180HX5	80.4	98.1	160.1	2.1	12.0	1
	8		1180HX8	116.4	134.1	196.1	2.1	12.0	1
11.9	3	●	MDW 1190HX3	44.4	62.2	124.2	2.2	12.0	1
	5	●	1190HX5	80.4	98.2	160.2	2.2	12.0	1
	8		1190HX8	116.4	134.2	196.2	2.2	12.0	1

Grade: ACX70

Diameter ø12.0 to 13.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.0	3	●	MDW 1200HX3	44.2	62.2	124.2	2.2	12.0	1
	5	●	1200HX5	80.2	98.2	160.2	2.2	12.0	1
	8	●	1200HX8	116.2	134.2	196.2	2.2	12.0	1
12.1	3		MDW 1210HX3	46.6	64.7	130.2	2.2	13.0	1
	5		1210HX5	84.1	102.2	169.2	2.2	13.0	1
	8		1210HX8	121.6	139.7	208.2	2.2	13.0	1
12.2	3		MDW 1220HX3	46.4	64.7	130.2	2.2	13.0	1
	5		1220HX5	83.9	102.2	169.2	2.2	13.0	1
	8		1220HX8	121.4	139.7	208.2	2.2	13.0	1
12.3	3		MDW 1230HX3	46.3	64.7	130.2	2.2	13.0	1
	5		1230HX5	83.8	102.2	169.2	2.2	13.0	1
	8		1230HX8	121.3	139.7	208.2	2.2	13.0	1
12.4	3		MDW 1240HX3	46.2	64.8	130.3	2.3	13.0	1
	5		1240HX5	83.7	102.3	169.3	2.3	13.0	1
	8		1240HX8	121.2	139.8	208.3	2.3	13.0	1
12.5	3	●	MDW 1250HX3	46.1	64.8	130.3	2.3	13.0	1
	5	●	1250HX5	83.6	102.3	169.3	2.3	13.0	1
	8	●	1250HX8	121.1	139.8	208.3	2.3	13.0	1
12.6	3		MDW 1260HX3	48.4	67.3	130.3	2.3	13.0	1
	5		1260HX5	87.4	106.3	169.3	2.3	13.0	1
	8		1260HX8	126.4	145.3	208.3	2.3	13.0	1
12.7	3		MDW 1270HX3	48.3	67.3	130.3	2.3	13.0	1
	5		1270HX5	87.3	106.3	169.3	2.3	13.0	1
	8		1270HX8	126.3	145.3	208.3	2.3	13.0	1
12.8	3		MDW 1280HX3	48.1	67.3	130.3	2.3	13.0	1
	5		1280HX5	87.1	106.3	169.3	2.3	13.0	1
	8		1280HX8	126.1	145.3	208.3	2.3	13.0	1
12.9	3		MDW 1290HX3	48.0	67.3	130.3	2.3	13.0	1
	5		1290HX5	87.0	106.3	169.3	2.3	13.0	1
	8		1290HX8	126.0	145.3	208.3	2.3	13.0	1
13.0	3	●	MDW 1300HX3	47.9	67.4	130.4	2.4	13.0	1
	5	●	1300HX5	86.9	106.4	169.4	2.4	13.0	1
	8	●	1300HX8	125.9	145.4	208.4	2.4	13.0	1
13.1	3		MDW 1310HX3	50.3	69.9	136.4	2.4	14.0	1
	5		1310HX5	90.8	110.4	178.4	2.4	14.0	1
	8		1310HX8	131.3	150.9	220.4	2.4	14.0	1
13.2	3		MDW 1320HX3	50.1	69.9	136.4	2.4	14.0	1
	5		1320HX5	90.6	110.4	178.4	2.4	14.0	1
	8		1320HX8	131.1	150.9	220.4	2.4	14.0	1
13.3	3		MDW 1330HX3	50.0	69.9	136.4	2.4	14.0	1
	5		1330HX5	90.5	110.4	178.4	2.4	14.0	1
	8		1330HX8	131.0	150.9	220.4	2.4	14.0	1
13.4	3		MDW 1340HX3	49.8	69.9	136.4	2.4	14.0	1
	5		1340HX5	90.3	110.4	178.4	2.4	14.0	1
	8		1340HX8	130.8	150.9	220.4	2.4	14.0	1
13.5	3	●	MDW 1350HX3	49.8	70.0	136.5	2.5	14.0	1
	5	●	1350HX5	90.3	110.5	178.5	2.5	14.0	1
	8	●	1350HX8	130.8	151.0	220.5	2.5	14.0	1
13.6	3		MDW 1360HX3	52.1	72.5	136.5	2.5	14.0	1
	5		1360HX5	94.1	114.5	178.5	2.5	14.0	1
	8		1360HX8	136.1	156.5	220.5	2.5	14.0	1
13.7	3		MDW 1370HX3	52.0	72.5	136.5	2.5	14.0	1
	5		1370HX5	94.0	114.5	178.5	2.5	14.0	1
	8		1370HX8	136.0	156.5	220.5	2.5	14.0	1

Grade: ACX70

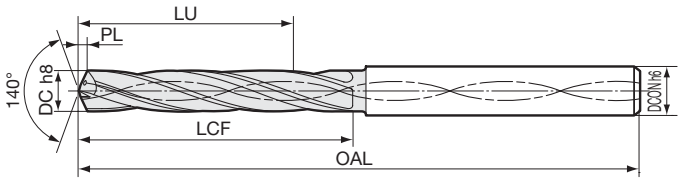
HX series (Internal Coolant Supply)

Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø13.8 to 15.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3		**MDW 1380HX3**	51.8	72.5	136.5	2.5	14.0	1
13.8	5		**1380HX5**	93.8	114.5	178.5	2.5	14.0	1
	8		**1380HX8**	135.8	156.5	220.5	2.5	14.0	1
	3		**MDW 1390HX3**	51.7	72.5	136.5	2.5	14.0	1
13.9	5		**1390HX5**	93.7	114.5	178.5	2.5	14.0	1
	8		**1390HX8**	135.7	156.5	220.5	2.5	14.0	1
	3	●	**MDW 1400HX3**	51.5	72.5	136.5	2.5	14.0	1
14.0	5	●	**1400HX5**	93.5	114.5	178.5	2.5	14.0	1
	8		**1400HX8**	135.5	156.5	220.5	2.5	14.0	1
	3		**MDW 1410HX3**	54.0	75.1	142.6	2.6	15.0	1
14.1	5		**1410HX5**	97.5	118.6	187.6	2.6	15.0	1
	8		**1410HX8**	141.0	162.1	232.6	2.6	15.0	1
	3		**MDW 1420HX3**	53.8	75.1	142.6	2.6	15.0	1
14.2	5		**1420HX5**	97.3	118.6	187.6	2.6	15.0	1
	8		**1420HX8**	140.8	162.1	232.6	2.6	15.0	1
	3		**MDW 1430HX3**	53.7	75.1	142.6	2.6	15.0	1
14.3	5		**1430HX5**	97.2	118.6	187.6	2.6	15.0	1
	8		**1430HX8**	140.7	162.1	232.6	2.6	15.0	1
	3		**MDW 1440HX3**	53.5	75.1	142.6	2.6	15.0	1
14.4	5		**1440HX5**	97.0	118.6	187.6	2.6	15.0	1
	8		**1440HX8**	140.5	162.1	232.6	2.6	15.0	1
	3	●	**MDW 1450HX3**	53.4	75.1	142.6	2.6	15.0	1
14.5	5	●	**1450HX5**	96.9	118.6	187.6	2.6	15.0	1
	8		**1450HX8**	140.4	162.1	232.6	2.6	15.0	1
	3		**MDW 1460HX3**	55.8	77.7	142.7	2.7	15.0	1
14.6	5		**1460HX5**	100.8	122.7	187.7	2.7	15.0	1
	8		**1460HX8**	145.8	167.7	232.7	2.7	15.0	1
	3		**MDW 1470HX3**	55.7	77.7	142.7	2.7	15.0	1
14.7	5		**1470HX5**	100.7	122.7	187.7	2.7	15.0	1
	8		**1470HX8**	145.7	167.7	232.7	2.7	15.0	1
	3		**MDW 1480HX3**	55.5	77.7	142.7	2.7	15.0	1
14.8	5		**1480HX5**	100.5	122.7	187.7	2.7	15.0	1
	8		**1480HX8**	145.5	167.7	232.7	2.7	15.0	1
	3		**MDW 1490HX3**	55.4	77.7	142.7	2.7	15.0	1
14.9	5		**1490HX5**	100.4	122.7	187.7	2.7	15.0	1
	8		**1490HX8**	145.4	167.7	232.7	2.7	15.0	1
	3	●	**MDW 1500HX3**	55.2	77.7	142.7	2.7	15.0	1
15.0	5	●	**1500HX5**	100.2	122.7	187.7	2.7	15.0	1
	8	●	**1500HX8**	145.2	167.7	232.7	2.7	15.0	1
	3		**MDW 1510HX3**	57.6	80.2	148.7	2.7	16.0	1
15.1	5		**1510HX5**	104.1	126.7	196.7	2.7	16.0	1
	8		**1510HX8**	150.6	173.2	244.7	2.7	16.0	1
	3		**MDW 1520HX3**	57.5	80.3	148.8	2.8	16.0	1
15.2	5		**1520HX5**	104.0	126.8	196.8	2.8	16.0	1
	8		**1520HX8**	150.5	173.3	244.8	2.8	16.0	1
	3		**MDW 1530HX3**	57.4	80.3	148.8	2.8	16.0	1
15.3	5		**1530HX5**	103.9	126.8	196.8	2.8	16.0	1
	8		**1530HX8**	150.4	173.3	244.8	2.8	16.0	1
	3		**MDW 1540HX3**	57.2	80.3	148.8	2.8	16.0	1
15.4	5		**1540HX5**	103.7	126.8	196.8	2.8	16.0	1
	8		**1540HX8**	150.2	173.3	244.8	2.8	16.0	1
	3	●	**MDW 1550HX3**	57.1	80.3	148.8	2.8	16.0	1
15.5	5	●	**1550HX5**	103.6	126.8	196.8	2.8	16.0	1
	8		**1550HX8**	150.1	173.3	244.8	2.8	16.0	1

Grade: ACX70

Diameter ø15.6 to 17.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3		**MDW 1560HX3**	59.4	82.8	148.8	2.8	16.0	1
15.6	5		**1560HX5**	107.4	130.8	196.8	2.8	16.0	1
	8		**1560HX8**	155.4	178.8	244.8	2.8	16.0	1
	3		**MDW 1570HX3**	59.4	82.9	148.9	2.9	16.0	1
15.7	5		**1570HX5**	107.4	130.9	196.9	2.9	16.0	1
	8		**1570HX8**	155.4	178.9	244.9	2.9	16.0	1
	3		**MDW 1580HX3**	59.2	82.9	148.9	2.9	16.0	1
15.8	5		**1580HX5**	107.2	130.9	196.9	2.9	16.0	1
	8		**1580HX8**	155.2	178.9	244.9	2.9	16.0	1
	3		**MDW 1590HX3**	59.1	82.9	148.9	2.9	16.0	1
15.9	5		**1590HX5**	107.1	130.9	196.9	2.9	16.0	1
	8		**1590HX8**	155.1	178.9	244.9	2.9	16.0	1
	3	●	**MDW 1600HX3**	58.9	82.9	148.9	2.9	16.0	1
16.0	5	●	**1600HX5**	106.9	130.9	196.9	2.9	16.0	1
	8		**1600HX8**	154.9	178.9	244.9	2.9	16.0	1
	3		**MDW 1610HX3**	61.3	85.4	154.9	2.9	17.0	1
16.1	5		**1610HX5**	110.8	134.9	205.9	2.9	17.0	1
	8		**1610HX8**	160.3	184.4	256.9	2.9	17.0	1
	3		**MDW 1620HX3**	61.1	85.4	154.9	2.9	17.0	1
16.2	5		**1620HX5**	110.6	134.9	205.9	2.9	17.0	1
	8		**1620HX8**	160.1	184.4	256.9	2.9	17.0	1
	3		**MDW 1630HX3**	61.1	85.5	155.0	3.0	17.0	1
16.3	5		**1630HX5**	110.6	135.0	206.0	3.0	17.0	1
	8		**1630HX8**	160.1	184.5	257.0	3.0	17.0	1
	3		**MDW 1640HX3**	60.9	85.5	155.0	3.0	17.0	1
16.4	5		**1640HX5**	110.4	135.0	206.0	3.0	17.0	1
	8		**1640HX8**	159.9	184.5	257.0	3.0	17.0	1
	3	●	**MDW 1650HX3**	60.8	85.5	155.0	3.0	17.0	1
16.5	5	●	**1650HX5**	110.3	135.0	206.0	3.0	17.0	1
	8		**1650HX8**	159.8	184.5	257.0	3.0	17.0	1
	3		**MDW 1660HX3**	63.1	88.0	155.0	3.0	17.0	1
16.6	5		**1660HX5**	114.1	139.0	206.0	3.0	17.0	1
	8		**1660HX8**	165.1	190.0	257.0	3.0	17.0	1
	3		**MDW 1670HX3**	63.0	88.0	155.0	3.0	17.0	1
16.7	5		**1670HX5**	114.0	139.0	206.0	3.0	17.0	1
	8		**1670HX8**	165.0	190.0	257.0	3.0	17.0	1
	3		**MDW 1680HX3**	62.9	88.1	155.1	3.1	17.0	1
16.8	5		**1680HX5**	113.9	139.1	206.1	3.1	17.0	1
	8		**1680HX8**	164.9	190.1	257.1	3.1	17.0	1
	3		**MDW 1690HX3**	62.8	88.1	155.1	3.1	17.0	1
16.9	5		**1690HX5**	113.8	139.1	206.1	3.1	17.0	1
	8		**1690HX8**	164.8	190.1	257.1	3.1	17.0	1
	3	●	**MDW 1700HX3**	62.6	88.1	155.1	3.1	17.0	1
17.0	5	●	**1700HX5**	113.6	139.1	206.1	3.1	17.0	1
	8		**1700HX8**	164.6	190.1	257.1	3.1	17.0	1
	3	●	**MDW 1710HX3**	65.0	90.6	161.1	3.1	18.0	1
17.1	5	●	**1710HX5**	117.5	143.1	217.1	3.1	18.0	1
	8	●	**1710HX8**	170.0	195.6	269.1	3.1	18.0	1
	3		**MDW 1720HX3**	64.8	90.6	161.1	3.1	18.0	1
17.2	5		**1720HX5**	117.3	143.1	217.1	3.1	18.0	1
	8		**1720HX8**	169.8	195.6	269.1	3.1	18.0	1
	3		**MDW 1730HX3**	64.7	90.6	161.1	3.1	18.0	1
17.3	5		**1730HX5**	117.2	143.1	217.1	3.1	18.0	1
	8		**1730HX8**	169.7	195.6	269.1	3.1	18.0	1

Grade: ACX70

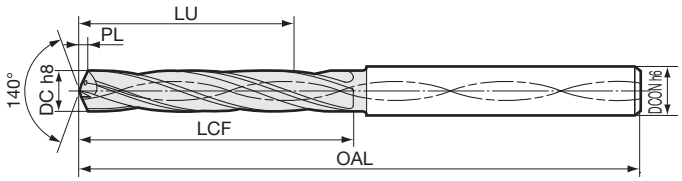
HX series (Internal Coolant Supply)

Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø17.4 to 18.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
17.4	3		MDW 1740HX3	64.6	90.7	161.2	3.2	18.0	1
	5		1740HX5	117.1	143.2	217.2	3.2	18.0	1
	8		1740HX8	169.6	195.7	269.2	3.2	18.0	1
17.5	3	●	MDW 1750HX3	64.5	90.7	161.2	3.2	18.0	1
	5	●	1750HX5	117.0	143.2	217.2	3.2	18.0	1
	8		1750HX8	169.5	195.7	269.2	3.2	18.0	1
17.6	3		MDW 1760HX3	66.8	93.2	161.2	3.2	18.0	1
	5		1760HX5	120.8	147.2	217.2	3.2	18.0	1
	8		1760HX8	174.8	201.2	269.2	3.2	18.0	1
17.7	3		MDW 1770HX3	66.7	93.2	161.2	3.2	18.0	1
	5		1770HX5	120.7	147.2	217.2	3.2	18.0	1
	8		1770HX8	174.7	201.2	269.2	3.2	18.0	1
17.8	3		MDW 1780HX3	66.5	93.2	161.2	3.2	18.0	1
	5		1780HX5	120.5	147.2	217.2	3.2	18.0	1
	8		1780HX8	174.5	201.2	269.2	3.2	18.0	1
17.9	3		MDW 1790HX3	66.5	93.3	161.3	3.3	18.0	1
	5		1790HX5	120.5	147.3	217.3	3.3	18.0	1
	8		1790HX8	174.5	201.3	269.3	3.3	18.0	1
18.0	3	●	MDW 1800HX3	66.3	93.3	161.3	3.3	18.0	1
	5	●	1800HX5	120.3	147.3	217.3	3.3	18.0	1
	8		1800HX8	174.3	201.3	269.3	3.3	18.0	1
18.1	3		MDW 1810HX3	68.7	95.8	167.3	3.3	19.0	1
	5		1810HX5	124.2	151.3	224.3	3.3	19.0	1
18.2	3		MDW 1820HX3	68.5	95.8	167.3	3.3	19.0	1
	5		1820HX5	124.0	151.3	224.3	3.3	19.0	1
18.3	3		MDW 1830HX3	68.4	95.8	167.3	3.3	19.0	1
	5		1830HX5	123.9	151.3	224.3	3.3	19.0	1

Grade: ACX70

Diameter ø18.4 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
18.4	3		MDW 1840HX3	68.2	95.8	167.3	3.3	19.0	1
	5		1840HX5	123.7	151.3	224.3	3.3	19.0	1
18.5	3	●	MDW 1850HX3	68.2	95.9	167.4	3.4	19.0	1
	5	●	1850HX5	123.7	151.4	224.4	3.4	19.0	1
18.6	3		MDW 1860HX3	70.5	98.4	167.4	3.4	19.0	1
	5		1860HX5	127.5	155.4	224.4	3.4	19.0	1
18.7	3		MDW 1870HX3	70.4	98.4	167.4	3.4	19.0	1
	5		1870HX5	127.4	155.4	224.4	3.4	19.0	1
18.8	3		MDW 1880HX3	70.2	98.4	167.4	3.4	19.0	1
	5		1880HX5	127.2	155.4	224.4	3.4	19.0	1
18.9	3		MDW 1890HX3	70.1	98.4	167.4	3.4	19.0	1
	5		1890HX5	127.1	155.4	224.4	3.4	19.0	1
19.0	3	●	MDW 1900HX3	70.0	98.5	167.5	3.5	19.0	1
	5	●	1900HX5	127.0	155.5	224.5	3.5	19.0	1
19.1	3		MDW 1910HX3	72.4	101.0	173.5	3.5	20.0	1
	5		1910HX5	130.9	159.5	233.5	3.5	20.0	1
19.2	3		MDW 1920HX3	72.2	101.0	173.5	3.5	20.0	1
	5		1920HX5	130.7	159.5	233.5	3.5	20.0	1
19.3	3		MDW 1930HX3	72.1	101.0	173.5	3.5	20.0	1
	5		1930HX5	130.6	159.5	233.5	3.5	20.0	1
19.4	3		MDW 1940HX3	71.9	101.0	173.5	3.5	20.0	1
	5		1940HX5	130.4	159.5	233.5	3.5	20.0	1
19.5	3	●	MDW 1950HX3	71.8	101.0	173.5	3.5	20.0	1
	5	●	1950HX5	130.3	159.5	233.5	3.5	20.0	1
19.6	3		MDW 1960HX3	74.2	103.6	173.6	3.6	20.0	1
	5		1960HX5	134.2	163.6	233.6	3.6	20.0	1
19.7	3		MDW 1970HX3	74.1	103.6	173.6	3.6	20.0	1
	5		1970HX5	134.1	163.6	233.6	3.6	20.0	1
19.8	3		MDW 1980HX3	73.9	103.6	173.6	3.6	20.0	1
	5		1980HX5	133.9	163.6	233.6	3.6	20.0	1
19.9	3		MDW 1990HX3	73.8	103.6	173.6	3.6	20.0	1
	5		1990HX5	133.8	163.6	233.6	3.6	20.0	1
20.0	3	●	MDW 2000HX3	73.6	103.6	173.6	3.6	20.0	1
	5	●	2000HX5	133.6	163.6	233.6	3.6	20.0	1

Grade: ACX70

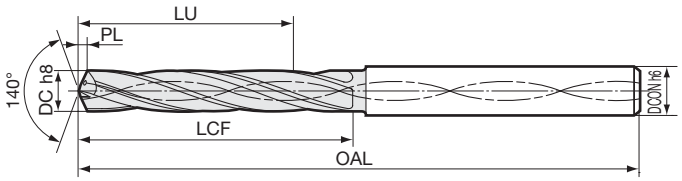
HX series (Internal Coolant Supply)

Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

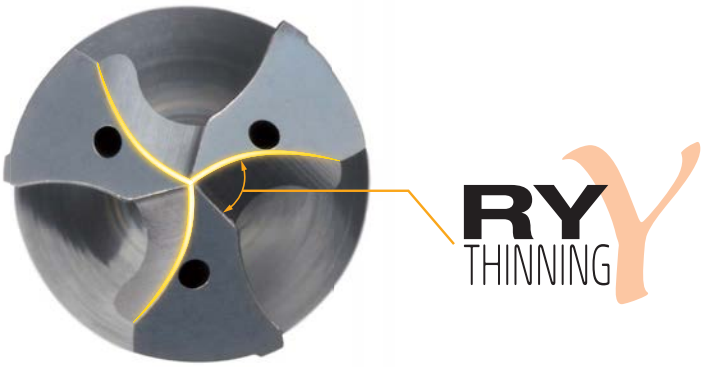
Diameter DC (mm)	Cutting Conditions	Gray Cast Iron FC250	Ductile Cast Iron FCD450
ø3.0	n	7,400	5,300
	vc	50 - **70** - 90	40 - **50** - 80
	f	0.10 - **0.20** - 0.30	0.12 - **0.18** - 0.24
ø5.0	n	4,500	3,800
	vc	50 - **70** - 90	40 - **50** - 80
	f	0.15 - **0.25** - 0.35	0.15 - **0.22** - 0.30
ø10.0	n	2,500	1,900
	vc	60 - **80** - 100	50 - **60** - 90
	f	0.20 - **0.35** - 0.50	0.20 - **0.30** - 0.40
ø20.0	n	1,600	1,000
	vc	70 - **100** - 120	60 - **80** - 100
	f	0.25 - **0.50** - 0.70	0.25 - **0.45** - 0.60

Min. - **Optimum** - Max.

HY series

■ General Features

Strong MULTIDRILL HY series is a 3 fluted drill that achieves stability and high-efficiency in drilling of steel and cast iron, reducing the load on each tooth and extending the tool life.



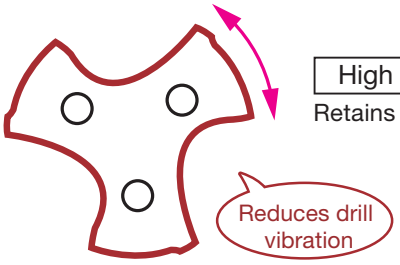
■ Features and Applications

● High-efficiency Drilling of Steel and Cast Iron

Thick web and 3-point margin design ensure stable hole diameter accuracy in high-efficiency drilling.
RY THINNING also reduces cutting force in high-efficiency drilling.
Applicable to cutting conditions exceeding vf = 800mm/min in steel drilling and vf = 1,000mm/min in cast iron drilling. (For ø10mm sizes)

● Long Tool Life

DEX Coat for drills utilises nano-coating technology to provide more than double the tool life of conventional coatings.
3-point margin design gives excellent guide performance for vibration control and long, stable tool life.



High Rigidity
Retains high rigidity with wide land

Jflute

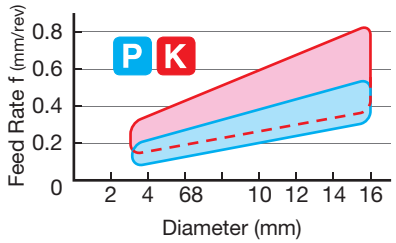
Evacuation
Drastically improved chip control and evacuation

Improves chip evacuation

■ Product Range

Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Number of items
Internal	MDW□□□□HY3	ø5.0 to ø16.0	up to 3	23 items in stock
	MDW□□□□HY5		up to 5	23 items in stock
	MDW□□□□HY8		up to 8	6 items in stock

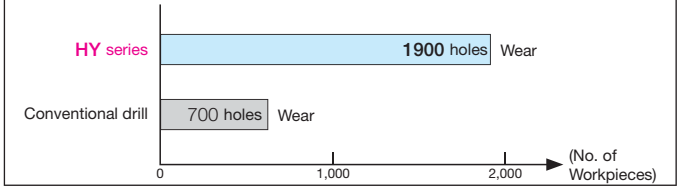
● Drilling of general steel and grey cast iron



■ Application Examples

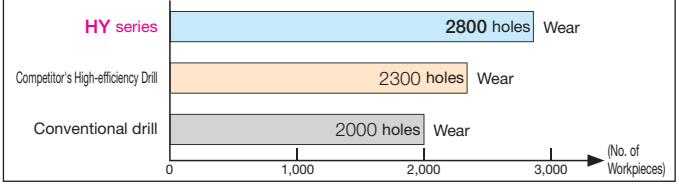
Machine Component (**SCM420**)
·Tool : MDW 1250HY3 (ø12.5mm 3D)
·Cutting Conditions : Conventional Tool: vc = 90m/min, f = 0.25mm/rev, vf = 573mm/min
HY series: vc = 70m/min, f = 0.40mm/rev, vf = 713mm/min
H = 12mm (through) Internal Coolant Supply (water-soluble)

1.25 times the efficiency and 2.7 times the tool life of conventional drills



Machine Component (**FCD450**)
·Tool : MDW 1020HY3 (ø10.2mm 3D)
·Cutting Conditions : Conventional Tool: vc = 70m/min, f = 0.28mm/rev, vf = 610mm/min
HY series: vc = 80m/min, f = 0.60mm/rev, vf = 1,500mm/min
H = 28mm (blind) Internal Coolant Supply (water-soluble)

2.5 times the efficiency and +1.4 times the tool life of conventional drills (1.2 times the tool life of competitors' high-efficiency drills)



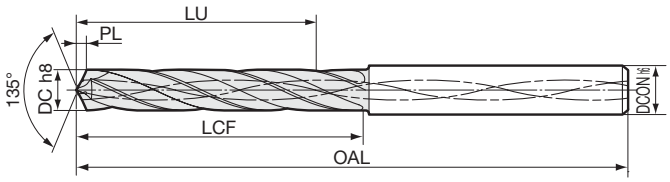
HY series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø5.0 to 9.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.0	3	●	MDW 0500HY3	21.0	28.5	81.0	1.0	5.0	1
	5	●	0500HY5	37.5	45.0	99.0	1.0	5.0	1
	8	●	0500HY8	48.5	56.0	106.0	1.0	5.0	1
5.1	3	●	MDW 0510HY3	21.0	28.6	83.1	1.1	6.0	1
	5	●	0510HY5	37.5	45.1	101.1	1.1	6.0	1
	8		0510HY8	54.0	61.6	119.1	1.1	6.0	1
6.0	3	●	MDW 0600HY3	22.2	31.2	83.2	1.2	6.0	1
	5	●	0600HY5	40.2	49.2	101.2	1.2	6.0	1
	8	●	0600HY8	58.2	67.2	119.2	1.2	6.0	1
6.5	3	●	MDW 0650HY3	24.1	33.8	89.3	1.3	7.0	1
	5	●	0650HY5	43.6	53.3	110.3	1.3	7.0	1
	8		0650HY8	63.1	72.8	131.3	1.3	7.0	1
6.8	3	●	MDW 0680HY3	26.2	36.4	89.4	1.4	7.0	1
	5	●	0680HY5	47.2	57.4	110.4	1.4	7.0	1
	8	●	0680HY8	68.2	78.4	131.4	1.4	7.0	1
7.0	3	●	MDW 0700HY3	25.9	36.4	89.4	1.4	7.0	1
	5	●	0700HY5	46.9	57.4	110.4	1.4	7.0	1
	8		0700HY8	67.9	78.4	131.4	1.4	7.0	1
8.0	3	●	MDW 0800HY3	29.7	41.7	95.7	1.7	8.0	1
	5	●	0800HY5	53.7	65.7	119.7	1.7	8.0	1
	8		0800HY8	77.7	89.7	143.7	1.7	8.0	1
8.5	3	●	MDW 0850HY3	31.6	44.3	101.8	1.8	9.0	1
	5	●	0850HY5	57.1	69.8	128.8	1.8	9.0	1
	8	●	0850HY8	82.6	95.3	155.8	1.8	9.0	1
8.6	3	●	MDW 0860HY3	33.9	46.8	101.8	1.8	9.0	1
	5	●	0860HY5	60.9	73.8	128.8	1.8	9.0	1
	8		0860HY8	87.9	100.8	155.8	1.8	9.0	1
8.8	3	●	MDW 0880HY3	33.6	46.8	101.8	1.8	9.0	1
	5	●	0880HY5	60.6	73.8	128.8	1.8	9.0	1
	8		0880HY8	87.6	100.8	155.8	1.8	9.0	1
9.0	3	●	MDW 0900HY3	33.4	46.9	101.9	1.9	9.0	1
	5	●	0900HY5	60.4	73.9	128.9	1.9	9.0	1
	8		0900HY8	87.4	100.9	155.9	1.9	9.0	1
9.5	3	●	MDW 0950HY3	35.3	49.5	108.0	2.0	10.0	1
	5	●	0950HY5	63.8	78.0	138.0	2.0	10.0	1
	8		0950HY8	92.3	106.5	168.0	2.0	10.0	1

Grade: ACX70

Diameter ø10.0 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.0	3	●	MDW 1000HY3	37.1	52.1	108.1	2.1	10.0	1
	5	●	1000HY5	67.1	82.1	138.1	2.1	10.0	1
	8		1000HY8	97.1	112.1	168.1	2.1	10.0	1
10.2	3	●	MDW 1020HY3	39.3	54.6	118.1	2.1	11.0	1
	5	●	1020HY5	70.8	86.1	151.1	2.1	11.0	1
	8		1020HY8	102.3	117.6	184.1	2.1	11.0	1
10.3	3	●	MDW 1030HY3	39.2	54.6	118.1	2.1	11.0	1
	5	●	1030HY5	70.7	86.1	151.1	2.1	11.0	1
	8	●	1030HY8	102.2	117.6	184.1	2.1	11.0	1
11.0	3	●	MDW 1100HY3	40.8	57.3	118.3	2.3	11.0	1
	5	●	1100HY5	73.8	90.3	151.3	2.3	11.0	1
	8		1100HY8	106.8	123.3	184.3	2.3	11.0	1
11.4	3	●	MDW 1140HY3	42.8	59.9	124.4	2.4	12.0	1
	5	●	1140HY5	77.3	94.4	160.4	2.4	12.0	1
	8		1140HY8	111.8	128.9	196.4	2.4	12.0	1
11.5	3	●	MDW 1150HY3	42.7	59.9	124.4	2.4	12.0	1
	5	●	1150HY5	77.2	94.4	160.4	2.4	12.0	1
	8		1150HY8	111.7	128.9	196.4	2.4	12.0	1
12.0	3	●	MDW 1200HY3	44.5	62.5	124.5	2.5	12.0	1
	5	●	1200HY5	80.5	98.5	160.5	2.5	12.0	1
	8		1200HY8	116.5	134.5	196.5	2.5	12.0	1
12.5	3	●	MDW 1250HY3	46.4	65.1	130.6	2.6	13.0	1
	5	●	1250HY5	83.9	102.6	169.6	2.6	13.0	1
	8	●	1250HY8	121.4	140.1	208.6	2.6	13.0	1
13.0	3	●	MDW 1300HY3	48.2	67.7	130.7	2.7	13.0	1
	5	●	1300HY5	87.2	106.7	169.7	2.7	13.0	1
	8		1300HY8	126.2	145.7	208.7	2.7	13.0	1
14.0	3	●	MDW 1400HY3	51.9	72.9	136.9	2.9	14.0	1
	5	●	1400HY5	93.9	114.9	178.9	2.9	14.0	1
	8		1400HY8	135.9	156.9	220.9	2.9	14.0	1
16.0	3	●	MDW 1600HY3	59.3	83.3	149.3	3.3	16.0	1
	5	●	1600HY5	107.3	131.3	197.3	3.3	16.0	1
	8		1600HY8	155.3	179.3	245.3	3.3	16.0	1

Grade: ACX70

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel/General Steel (up to 300HB)	Gray Cast Iron FC250	Ductile Cast Iron FCD450
ø5.0	n	2,600	1,900	1,900
	vc	50 - **80** - 120	50 - **70** - 90	40 - **50** - 80
	f	0.15 - **0.20** - 0.25	0.20 - **0.30** - 0.45	0.18 - **0.24** - 0.30
ø10.0	n	2,600	1,900	1,900
	vc	70 - **100** - 150	60 - **80** - 100	50 - **60** - 90
	f	0.20 - **0.30** - 0.40	0.30 - **0.45** - 0.60	0.30 - **0.40** - 0.50
ø16.0	n	2,000	1,600	1,200
	vc	80 - **120** - 160	70 - **100** - 120	60 - **80** - 100
	f	0.35 - **0.45** - 0.55	0.40 - **0.60** - 0.80	0.40 - **0.55** - 0.70

Min. - **Optimum** - Max.

D series (External Coolant Supply/Standard type)

Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Ti Alloy

ZX Coat | 3D

*Refer to N36 for the tolerance of h8

Fig 1 (ø1.9 or less)

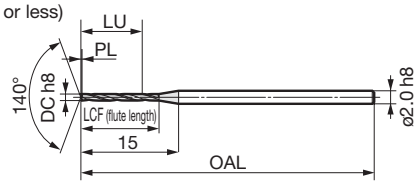
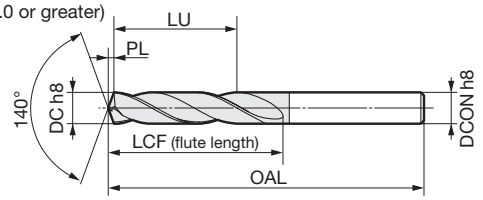


Fig 2 (ø2.0 or greater)



Diameter ø1.0 to 6.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	3		MDS 010MD	10.7	12.2	45.2	0.2	2.0	1
1.1			011MD	11.6	13.2	45.2	0.2	2.0	1
1.2			012MD	12.4	14.2	45.2	0.2	2.0	1
1.3			013MD	12.3	14.2	45.2	0.2	2.0	1
1.4	3		MDS 014MD	13.2	15.3	45.3	0.3	2.0	1
1.5			015MD	13.1	15.3	45.3	0.3	2.0	1
1.6			016MD	12.9	15.3	45.3	0.3	2.0	1
1.7			017MD	12.8	15.3	45.3	0.3	2.0	1
1.8			018MD	12.6	15.3	45.3	0.3	2.0	1
1.9			019MD	12.5	15.3	45.3	0.3	2.0	1
2.0	3		MDS 020MD	12.4	15.4	45.4	0.4	2.0	2
2.1			021MD	12.3	15.4	45.4	0.4	2.1	2
2.2			022MD	13.1	16.4	46.4	0.4	2.2	2
2.3			023MD	13.0	16.4	46.4	0.4	2.3	2
2.4			024MD	13.8	17.4	47.4	0.4	2.4	2
2.5	3		MDS 025MD	13.8	17.5	47.5	0.5	2.5	2
2.6			026MD	13.6	17.5	47.5	0.5	2.6	2
2.7			027MD	15.5	19.5	49.5	0.5	2.7	2
2.8			028MD	15.3	19.5	49.5	0.5	2.8	2
2.9			029MD	15.2	19.5	49.5	0.5	2.9	2
3.0			030MD	15.0	19.5	49.5	0.5	3.0	2
3.1	3		MDS 031MD	17.0	21.6	52.6	0.6	3.1	2
3.2			032MD	16.8	21.6	52.6	0.6	3.2	2
3.3			033MD	16.7	21.6	52.6	0.6	3.3	2
3.4			034MD	19.5	24.6	56.6	0.6	3.4	2
3.5			035MD	19.4	24.6	56.6	0.6	3.5	2
3.6	3		MDS 036MD	19.3	24.7	56.7	0.7	3.6	2
3.7			037MD	19.2	24.7	56.7	0.7	3.7	2
3.8			038MD	22.0	27.7	60.7	0.7	3.8	2
3.9			039MD	21.9	27.7	60.7	0.7	3.9	2
4.0			040MD	21.7	27.7	60.7	0.7	4.0	2
4.1			041MD	21.6	27.7	60.7	0.7	4.1	2
4.2	3		MDS 042MD	21.5	27.8	60.8	0.8	4.2	2
4.3			043MD	25.4	31.8	65.8	0.8	4.3	2
4.4			044MD	25.2	31.8	65.8	0.8	4.4	2
4.5			045MD	25.1	31.8	65.8	0.8	4.5	2
4.6			046MD	24.9	31.8	65.8	0.8	4.6	2
4.7	3		MDS 047MD	24.9	31.9	65.9	0.9	4.7	2
4.8			048MD	26.7	33.9	69.9	0.9	4.8	2
4.9			049MD	26.6	33.9	69.9	0.9	4.9	2
5.0			050MD	31.4	38.9	76.9	0.9	5.0	2
5.1			051MD	31.3	38.9	76.9	0.9	5.1	2
5.2			052MD	31.1	38.9	76.9	0.9	5.2	2
5.3	3		MDS 053MD	31.1	39.0	77.0	1.0	5.3	2
5.4			054MD	30.9	39.0	77.0	1.0	5.4	2
5.5			055MD	30.8	39.0	77.0	1.0	5.5	2
5.6			056MD	33.6	42.0	82.0	1.0	5.6	2
5.7			057MD	33.5	42.0	82.0	1.0	5.7	2
5.8	3		MDS 058MD	33.4	42.1	82.1	1.1	5.8	2
5.9			059MD	33.3	42.1	82.1	1.1	5.9	2
6.0			060MD	33.1	42.1	82.1	1.1	6.0	2
6.1			061MD	33.0	42.1	82.1	1.1	6.1	2
6.2			062MD	32.8	42.1	82.1	1.1	6.2	2
6.3			063MD	32.7	42.1	82.1	1.1	6.3	2
6.4	3		MDS 064MD	32.6	42.2	82.2	1.2	6.4	2
6.5			065MD	32.5	42.2	82.2	1.2	6.5	2

Grade: ACZ51S

Diameter ø6.6 to 12.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.6	3		MDS 066MD	34.3	44.2	84.2	1.2	6.6	2
6.7			067MD	34.2	44.2	84.2	1.2	6.7	2
6.8			068MD	34.0	44.2	84.2	1.2	6.8	2
6.9	3		MDS 069MD	34.0	44.3	84.3	1.3	6.9	2
7.0			070MD	33.8	44.3	84.3	1.3	7.0	2
7.1			071MD	35.7	46.3	88.3	1.3	7.1	2
7.2			072MD	35.5	46.3	88.3	1.3	7.2	2
7.3			073MD	35.4	46.3	88.3	1.3	7.3	2
7.4			074MD	35.2	46.3	88.3	1.3	7.4	2
7.5	3		MDS 075MD	35.2	46.4	88.4	1.4	7.5	2
7.6			076MD	38.0	49.4	91.4	1.4	7.6	2
7.7			077MD	37.9	49.4	91.4	1.4	7.7	2
7.8			078MD	37.7	49.4	91.4	1.4	7.8	2
7.9			079MD	37.6	49.4	91.4	1.4	7.9	2
8.0	3		MDS 080MD	37.5	49.5	91.5	1.5	8.0	2
8.1			081MD	42.4	54.5	97.5	1.5	8.1	2
8.2			082MD	42.2	54.5	97.5	1.5	8.2	2
8.3			083MD	42.1	54.5	97.5	1.5	8.3	2
8.4			084MD	41.9	54.5	97.5	1.5	8.4	2
8.5			085MD	41.8	54.5	97.5	1.5	8.5	2
8.6	3		MDS 086MD	43.7	56.6	99.6	1.6	8.6	2
8.7			087MD	43.6	56.6	99.6	1.6	8.7	2
8.8			088MD	43.4	56.6	99.6	1.6	8.8	2
8.9			089MD	43.3	56.6	99.6	1.6	8.9	2
9.0			090MD	43.1	56.6	99.6	1.6	9.0	2
9.1	3		MDS 091MD	46.1	59.7	103.7	1.7	9.1	2
9.2			092MD	45.9	59.7	103.7	1.7	9.2	2
9.3			093MD	45.8	59.7	103.7	1.7	9.3	2
9.4			094MD	45.6	59.7	103.7	1.7	9.4	2
9.5			095MD	45.5	59.7	103.7	1.7	9.5	2
9.6			096MD	47.3	61.7	106.7	1.7	9.6	2
9.7	3		MDS 097MD	47.3	61.8	106.8	1.8	9.7	2
9.8			098MD	47.1	61.8	106.8	1.8	9.8	2
9.9			099MD	47.0	61.8	106.8	1.8	9.9	2
10.0			100MD	46.8	61.8	106.8	1.8	10.0	2
10.1			101MD	52.7	67.8	113.8	1.8	10.1	2
10.2	3		MDS 102MD	52.6	67.9	113.9	1.9	10.2	2
10.3			103MD	52.5	67.9	113.9	1.9	10.3	2
10.4			104MD	52.3	67.9	113.9	1.9	10.4	2
10.5			105MD	52.2	67.9	113.9	1.9	10.5	2
10.6			106MD	54.0	69.9	115.9	1.9	10.6	2
10.7			107MD	53.9	69.9	115.9	1.9	10.7	2
10.8	3		MDS 108MD	53.8	70.0	116.0	2.0	10.8	2
10.9			109MD	53.7	70.0	116.0	2.0	10.9	2
11.0			110MD	53.5	70.0	116.0	2.0	11.0	2
11.1			111MD	56.4	73.0	120.0	2.0	11.1	2
11.2			112MD	56.2	73.0	120.0	2.0	11.2	2
11.3	3		MDS 113MD	56.2	73.1	120.1	2.1	11.3	2
11.4			114MD	56.0	73.1	120.1	2.1	11.4	2
11.5			115MD	55.9	73.1	120.1	2.1	11.5	2
11.6			116MD	57.7	75.1	123.1	2.1	11.6	2
11.7			117MD	57.6	75.1	123.1	2.1	11.7	2
11.8			118MD	57.4	75.1	123.1	2.1	11.8	2
11.9	3		MDS 119MD	57.4	75.2	123.2	2.2	11.9	2
12.0			120MD	57.2	75.2	123.2	2.2	12.0	2
12.1			121MD	60.1	78.2	137.2	2.2	12.1	2

Grade: ACZ51S

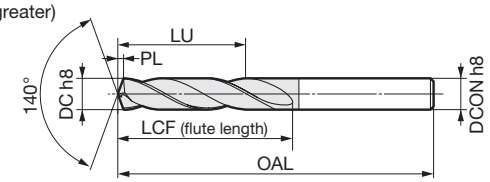
D series (External Coolant Supply/Standard type)

Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Ti Alloy

ZX Coat 3D

*Refer to N36 for the tolerance of h8

Fig 2 (ø2.0 or greater)



Diameter ø12.2 to 16.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.2	3		**MDS 122MD**	59.9	78.2	137.2	2.2	12.2	2
12.3			**123MD**	59.8	78.2	137.2	2.2	12.3	2
12.4	3		**MDS 124MD**	59.7	78.3	137.3	2.3	12.4	2
12.5			**125MD**	59.6	78.3	137.3	2.3	12.5	2
12.6			**126MD**	61.4	80.3	139.3	2.3	12.6	2
12.7			**127MD**	61.3	80.3	139.3	2.3	12.7	2
12.8			**128MD**	61.1	80.3	139.3	2.3	12.8	2
12.9			**129MD**	61.0	80.3	139.3	2.3	12.9	2
13.0	3		**MDS 130MD**	60.9	80.4	139.4	2.4	13.0	2
13.1			**131MD**	66.8	86.4	146.4	2.4	13.1	2
13.2			**132MD**	66.6	86.4	146.4	2.4	13.2	2
13.3			**133MD**	66.5	86.4	146.4	2.4	13.3	2
13.4			**134MD**	66.3	86.4	146.4	2.4	13.4	2
13.5	3		**MDS 135MD**	66.3	86.5	146.5	2.5	13.5	2
13.6			**136MD**	68.1	88.5	149.5	2.5	13.6	2
13.7			**137MD**	68.0	88.5	149.5	2.5	13.7	2
13.8			**138MD**	67.8	88.5	149.5	2.5	13.8	2
13.9			**139MD**	67.7	88.5	149.5	2.5	13.9	2
14.0			**140MD**	67.5	88.5	149.5	2.5	14.0	2
14.1	3		**MDS 141MD**	70.5	91.6	153.6	2.6	14.1	2
14.2			**142MD**	70.3	91.6	153.6	2.6	14.2	2
14.3			**143MD**	70.2	91.6	153.6	2.6	14.3	2
14.4			**144MD**	70.0	91.6	153.6	2.6	14.4	2
14.5			**145MD**	69.9	91.6	153.6	2.6	14.5	2
14.6	3		**MDS 146MD**	71.8	93.7	155.7	2.7	14.6	2
14.7			**147MD**	71.7	93.7	155.7	2.7	14.7	2
14.8			**148MD**	71.5	93.7	155.7	2.7	14.8	2
14.9			**149MD**	71.4	93.7	155.7	2.7	14.9	2
15.0			**150MD**	71.2	93.7	155.7	2.7	15.0	2
15.1			**151MD**	74.1	96.7	159.7	2.7	15.1	2
15.2	3		**MDS 152MD**	74.0	96.8	159.8	2.8	15.2	2
15.3			**153MD**	73.9	96.8	159.8	2.8	15.3	2
15.4			**154MD**	73.7	96.8	159.8	2.8	15.4	2
15.5			**155MD**	73.6	96.8	159.8	2.8	15.5	2
15.6			**156MD**	75.4	98.8	162.8	2.8	15.6	2
15.7	3		**MDS 157MD**	75.4	98.9	162.9	2.9	15.7	2
15.8			**158MD**	75.2	98.9	162.9	2.9	15.8	2
15.9			**159MD**	75.1	98.9	162.9	2.9	15.9	2
16.0			**160MD**	74.9	98.9	162.9	2.9	16.0	2
16.1			**161MD**	80.8	104.9	169.9	2.9	16.1	2

Grade: ACZ51S

Diameter ø16.2 to 20.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
16.2	3		**MDS 162MD**	80.6	104.9	169.9	2.9	16.2	2
16.3	3		**MDS 163MD**	80.6	105.0	170.0	3.0	16.3	2
16.4			**164MD**	80.4	105.0	170.0	3.0	16.4	2
16.5			**165MD**	80.3	105.0	170.0	3.0	16.5	2
16.6			**166MD**	80.1	105.0	170.0	3.0	16.6	2
16.7			**167MD**	80.0	105.0	170.0	3.0	16.7	2
16.8	3		**MDS 168MD**	79.9	105.1	170.1	3.1	16.8	2
16.9			**169MD**	79.8	105.1	170.1	3.1	16.9	2
17.0			**170MD**	79.6	105.1	170.1	3.1	17.0	2
17.1			**171MD**	79.5	105.1	170.1	3.1	17.1	2
17.2			**172MD**	79.3	105.1	170.1	3.1	17.2	2
17.3			**173MD**	79.2	105.1	170.1	3.1	17.3	2
17.4	3		**MDS 174MD**	79.1	105.2	170.2	3.2	17.4	2
17.5			**175MD**	79.0	105.2	170.2	3.2	17.5	2
17.6			**176MD**	78.8	105.2	170.2	3.2	17.6	2
17.7			**177MD**	78.7	105.2	170.2	3.2	17.7	2
17.8			**178MD**	78.5	105.2	170.2	3.2	17.8	2
17.9	3		**MDS 179MD**	78.5	105.3	170.3	3.3	17.9	2
18.0			**180MD**	78.3	105.3	170.3	3.3	18.0	2
18.1			**181MD**	90.2	117.3	182.3	3.3	18.1	2
18.2			**182MD**	90.0	117.3	182.3	3.3	18.2	2
18.3			**183MD**	89.9	117.3	182.3	3.3	18.3	2
18.4			**184MD**	89.7	117.3	182.3	3.3	18.4	2
18.5	3		**MDS 185MD**	89.7	117.4	182.4	3.4	18.5	2
18.6			**186MD**	89.5	117.4	182.4	3.4	18.6	2
18.7			**187MD**	89.4	117.4	182.4	3.4	18.7	2
18.8			**188MD**	89.2	117.4	182.4	3.4	18.8	2
18.9			**189MD**	89.1	117.4	182.4	3.4	18.9	2
19.0	3		**MDS 190MD**	89.0	117.5	182.5	3.5	19.0	2
19.1			**191MD**	88.9	117.5	182.5	3.5	19.1	2
19.2			**192MD**	88.7	117.5	182.5	3.5	19.2	2
19.3			**193MD**	88.6	117.5	182.5	3.5	19.3	2
19.4			**194MD**	88.4	117.5	182.5	3.5	19.4	2
19.5			**195MD**	88.3	117.5	182.5	3.5	19.5	2
19.6	3		**MDS 196MD**	88.2	117.6	182.6	3.6	19.6	2
19.7			**197MD**	88.1	117.6	182.6	3.6	19.7	2
19.8			**198MD**	87.9	117.6	182.6	3.6	19.8	2
19.9			**199MD**	87.8	117.6	182.6	3.6	19.9	2
20.0			**200MD**	87.6	117.6	182.6	3.6	20.0	2

Grade: ACZ51S

Recommended Cutting Conditions (D series)

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Hardened Steel (up to 45HRC)	Hardened Steel (up to 60HRC)	Titanium Alloy 6Al-4V-Ti
ø3.0	n	3,200	1,600	3,200
	vc	20 - **30** - 40	10 - **15** - 20	5 - **10** - 25
	f	0.06 - **0.07** - 0.08	0.05 - **0.06** - 0.08	0.05 - **0.06** - 0.08
ø5.0	n	2,400	1,200	2,400
	vc	20 - **30** - 40	10 - **15** - 20	5 - **10** - 25
	f	0.08 - **0.09** - 0.10	0.05 - **0.06** - 0.08	0.05 - **0.06** - 0.08
ø10.0	n	1,000	500	950
	vc	20 - **30** - 40	10 - **15** - 20	10 - **15** - 30
	f	0.10 - **0.12** - 0.15	0.06 - **0.08** - 0.10	0.07 - **0.09** - 0.10
ø16.0	n	600	300	600
	vc	20 - **30** - 40	10 - **15** - 20	10 - **15** - 30
	f	0.10 - **0.13** - 0.15	0.08 - **0.10** - 0.12	0.07 - **0.09** - 0.10
ø20.0	n	500	250	500
	vc	20 - **30** - 40	10 - **15** - 20	10 - **15** - 30
	f	0.10 - **0.13** - 0.15	0.08 - **0.10** - 0.12	0.07 - **0.09** - 0.10

Min. - **Optimum** - Max.

SGS series

■ General Features

SGS series drills for heat-resistant alloys employ a sharp cutting edge to reduce heat during drilling (reduce cutting force) and provide a long, stable tool life.

■ Features and Applications

● Long tool life

· Combination of optimised cutting edge design and dedicated grade significantly reduces wear.
· Minute honing (cutting edge treatment) amount and special thinning shape reduce cutting force. This reduces cutting edge fracture.
· Perfect for drilling Ni-based heat-resistant alloys (Inconel/Waspaloy/Hastelloy).

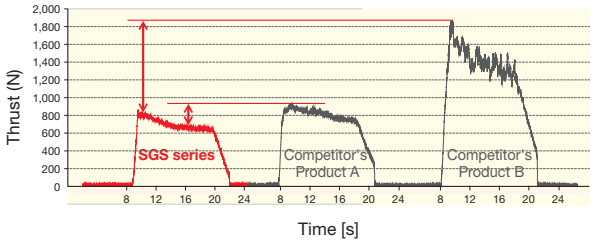
■ Product Range

Cat. No.	Diameter Range (mm)	Hole Depth (L/D)
MDW□□□□SGS3	ø3.0 to 12.0	up to 3

■ Performance

Comparison of Cutting Force (Thrust)

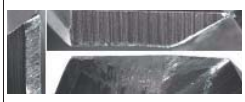
Low Resistance (Reduced Load on Cutting Edge)



Tool Diameter : ø6.0
Work Material : Inconel 718
Cutting Conditions : vc = 10m/min, f = 0.08mm/rev, H = 8mm (through), External Coolant Supply

Tool Life Comparison

Long Tool Life (No Fracturing or Breakage)

Tool	SGS series	Competitor's Product A	Competitor's Product B
No. of Workpieces	Able to continue after 50 holes	Fracture after 30 holes	Breakage after 5 holes
Photo			

Tool Diameter : ø6.0
Work Material : Inconel 718
Cutting Conditions : vc = 10m/min, f = 0.08mm/rev, H = 16mm (blind), External Coolant Supply

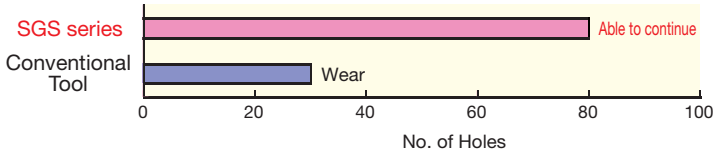
■ Application Examples

Comparison of Cutting Edge Wear after 30 Holes

Significantly Reduced Flank Wear

SGS series

Conventional Tool



Tool : MDW 0600SGS3
Work Material : Inconel 718 (aerospace components)
Cutting Conditions : vc = 10m/min, f = 0.06mm/rev, H = 3mm (through), External Coolant Supply

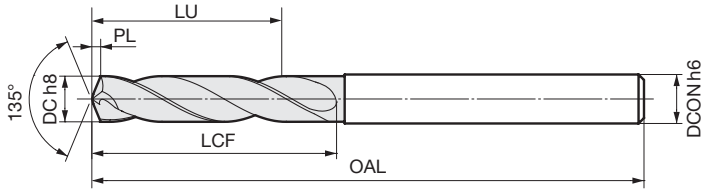
SGS series (External Coolant Supply)

Stainless Steel | Ti Alloy | Heat-resistant Steel

PVD Coat | 3D

*Refer to N36 for the tolerance of h6 and h8

Fig 1



Diameter ø3.0 to 12.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	**MDW 0300SGS3**	13.6	18.1	49.6	0.6	3.0	1
3.5	3	●	**MDW 0350SGS3**	15.5	20.7	60.7	0.7	4.0	1
4.0	3	●	**0400SGS3**	17.3	23.3	60.8	0.8	4.0	1
4.5	3	●	**MDW 0450SGS3**	19.2	25.9	76.9	0.9	5.0	1
5.0	3	●	**0500SGS3**	21.0	28.5	77.0	1.0	5.0	1
5.5	3	●	**MDW 0550SGS3**	20.4	28.6	82.1	1.1	6.0	1
6.0	3	●	**0600SGS3**	22.2	31.2	82.2	1.2	6.0	1
6.5	3	●	**MDW 0650SGS3**	24.1	33.8	84.3	1.3	7.0	1
7.0	3	●	**0700SGS3**	25.9	36.4	84.4	1.4	7.0	1
7.5	3	●	**MDW 0750SGS3**	27.9	39.1	91.6	1.6	8.0	1
8.0	3	●	**0800SGS3**	29.7	41.7	91.7	1.7	8.0	1
8.5	3	●	**MDW 0850SGS3**	31.6	44.3	99.8	1.8	9.0	1
9.0	3	●	**0900SGS3**	33.4	46.9	99.9	1.9	9.0	1
9.5	3	●	**MDW 0950SGS3**	35.3	49.5	107.0	2.0	10.0	1
10.0	3	●	**1000SGS3**	37.1	52.1	107.1	2.1	10.0	1
10.5	3	●	**MDW 1050SGS3**	39.0	54.7	116.2	2.2	11.0	1
11.0	3	●	**1100SGS3**	40.8	57.3	116.3	2.3	11.0	1
11.5	3	●	**MDW 1150SGS3**	42.7	59.9	123.4	2.4	12.0	1
12.0	3	●	**1200SGS3**	44.5	62.5	123.5	2.5	12.0	1

Grade: ACW52S

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Titanium Alloy Ti	Heat-Resistant Alloy Inconel
ø6.0	n	1,100	800
	vc	10 - **20** - 30	10 - **15** - 30
	f	0.05 - **0.08** - 0.10	0.05 - **0.08** - 0.10
ø10.0	n	600	500
	vc	10 - **20** - 30	10 - **15** - 30
	f	0.07 - **0.10** - 0.12	0.07 - **0.10** - 0.12
ø12.0	n	500	500
	vc	10 - **20** - 30	15 - **20** - 30
	f	0.07 - **0.10** - 0.12	0.07 - **0.10** - 0.12

Min. - **Optimum** - Max.

Super MULTIDRILL

XHGS series/PHT series

■ General Features

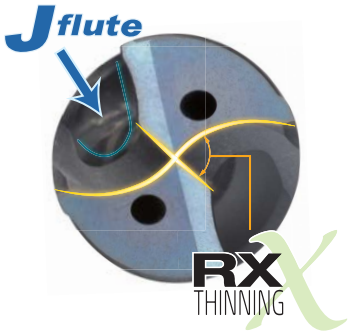
Super MULTIDRILL XHGS series, a next-generation drill specialized for deep hole drilling, features high drill strength and stable chip control to further enhance efficiency of deep hole drilling.

■ Features

● Deep hole drilling
- · J-flute shape achieves improved chip control during deep hole drilling
- · High-efficiency drilling at over vf = 1,000mm/min at depths 20 times the diameter (diameter ø5, equivalent to S48C)
- · Special web thinning shape (RX THINNING) reduces drilling force during high-efficiency machining

● Long tool life
- · Special DEX Coat provides long tool life on a wide variety of work materials
- · Improved chip evacuation makes it possible to reduce spindle load fluctuation, ensuring long, stable tool life

● Eco-friendly
- · Compatible with the MQL (Minimum Quantity Lubrication) system
- · Compatible with dual-fluid mist (simultaneous spray of oil and water)



■ Product Range

Applications	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Number of items
Deep Hole Drilling	MDW□□□□XHGS10	ø2.1 to 16.0	up to 10	76 items in stock
	MDW□□□□XHGS12	ø2.5 to 16.0	up to 12	28 items in stock
	MDW□□□□XHGS15	ø2.1 to 16.0	up to 15	76 items in stock
	MDW□□□□XHGS20	ø2.1 to 14.0	up to 20	72 items in stock
	MDW□□□□XHGS25	ø2.1 to 12.0	up to 25	68 items in stock
	MDW□□□□XHGS30	ø2.1 to 10.0	up to 30	64 items in stock
For Guide Holes	MDW□□□□PHT	ø2.1 to 16.0	up to 2	76 items in stock

■ Application Examples

● Automotive Component (equivalent to S38C)

Tool : ø5.0x115mm (PHT series), ø5.0x170mm (XHGS series)
Machine : Horizontal single-spindle NC machine
Coolant : MQL (air pressure 0.5MPa, volume approx. 4cc/h)
Cutting Conditions : vc = 80m/min, f = 0.28mm/rev, H = 85mm per hole (3 holes per unit)
Tool life : 500 units (113m)

● Automotive Component (equivalent to S43C)

Tool : ø6.0x170mm (PHT series), ø6.0x230mm (XHGS series)
Machine : Horizontal single-spindle NC machine
Coolant : MQL (air pressure 0.5MPa, volume approx. 40cc/h)
Cutting Conditions : vc = 80m/min, f = 0.18mm/rev, H = 110mm per hole (4 holes per unit)
Tool life : 150 units (113m)

● Automotive Component (equivalent to FCD700)

Tool : ø5.0x105mm (PHT series), ø5.0x155mm (XHGS series)
Machine : Horizontal single-spindle NC machine
Coolant : MQL (air pressure 0.4MPa, volume approx. 4cc/h)
Cutting Conditions : vc = 50m/min, f = 0.18mm/rev, H = 60mm per hole (5 holes per unit)
Tool life : 400 units (120m)

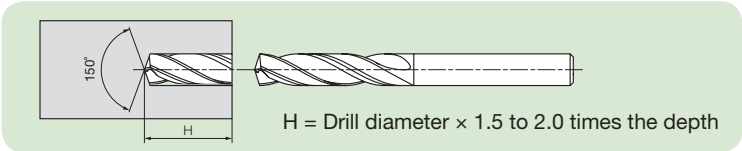
● Machine Component (equivalent to S45C)

Tool : ø6.0x90mm (PHT series), ø6.0x145mm (XHGS series)
Machine : Horizontal single-spindle NC machine
Coolant : MQL (air pressure 0.5MPa, volume approx. 60cc/h)
Cutting Conditions : vc = 80m/min, f = 0.20mm/rev, H = 62mm per hole (3 holes per unit)
Tool life : 550 units (104m)

■ Recommended Drilling Method

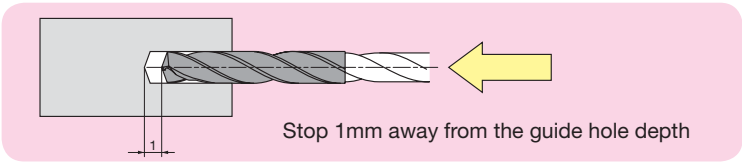
(1) Make a guide hole using the PHT series

- Select the same nominal diameter for the PHT series dedicated guide hole drill as the XHGS series deep hole drill. (The guide drill diameter is designed to be 0. 02mm to 0. 05mm larger than the long drill diameter.)



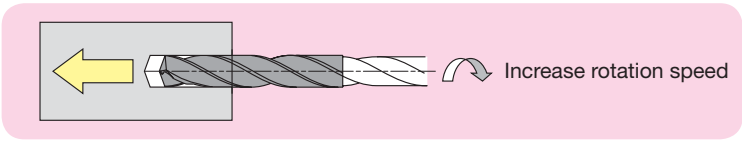
(2) Feed the XHGS series deep hole drill through the guide hole at low rotation speed

- Spindle Speed: 500min^{-1}
- Feed Rate: 1,000 to 2,000mm/min



* If the drill is inserted into the guide hole at the set cutting speed, peripheral run-out may cause damage to the drill's peripheral edges.

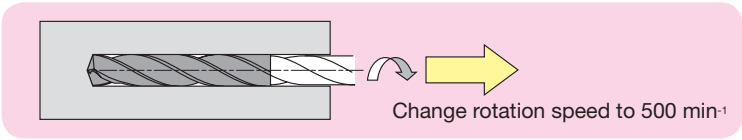
(3) Increase rotation speed until the set cutting speed is reached, then start normal drilling operation



* On some NC machines, the feed command may be activated before the set spindle speed is reached, so it is recommended to enter a dwell sequence before the feed command.

(4) After drilling, rotation speed is reduced and the drill is retracted from the work material

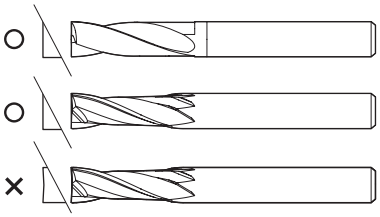
- Spindle speed: 500min^{-1} Feed rate: 1,000 to 2,000mm/min



* Retracting a drill from the work material at a high rotation speed is dangerous as doing so may result in breakage due to runout.

(5) Other notes

- A flat base should be prepared first if the entry side is a non-flat surface (slanted surface, cylindrical surface, etc.).



○ Flat Bottom Drilling using an endmill or Flat MULTIDRILL MDF series (see page J26)

○

× Concave ended endmills cannot be used.

- If the exit side is a non-flat surface, reduce the feed rate to f = 0.05mm/rev immediately before the breakthrough point to prevent the drill from fracturing or burrs from forming.

■ Coolant

(1) Internal coolant supply

- Use coolant equivalent to JIS A1-1 (emulsion).
- Pump pressure Steel: 1. 5 to 2. 0MPa (higher pressure results in a stronger cooling effect, which affects chips and wear)
  Cast iron and aluminum alloy: 4.0 to 6.0MPa (prioritize cooling performance)

(2) Internal MQL

- Air pressure : 0.5MPa or greater
- Evacuation volume : It is recommended to set the maximum evacuation volume for your equipment.
  *Consult the manufacturer if you intend to machine aluminum alloy.

(3) Internal dual-fluid mist

- Air pressure : 0.5MPa or greater
- Evacuation volume : It is recommended to use the optimal setting for your equipment.

XHGS series/PHT series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.25% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 10D | 12D | 15D | 20D | 25D | 30D | Pilot 3D

*Refer to N36 for the tolerance of h6, h8 and e8

Fig 1 (PHT series)

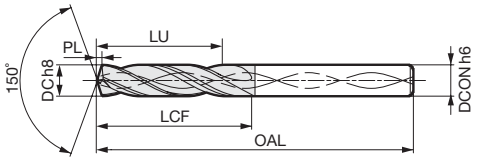
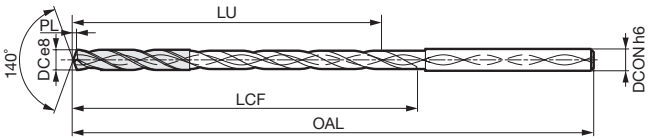


Fig 2 (XHGS series)



Diameter ø2.1 to 2.8mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.1	3	●	MDW 0210PHT	12.2	15.3	68.3	0.3	3.0	1
	10	●	0210XHGS10	35.3	38.4	88.4	0.4	3.0	2
	15	●	0210XHGS15	45.3	48.4	98.4	0.4	3.0	2
	20	●	0210XHGS20	58.3	61.4	111.4	0.4	3.0	2
	25	●	0210XHGS25	70.3	73.4	123.4	0.4	3.0	2
	30	●	0210XHGS30	83.3	86.4	136.4	0.4	3.0	2
2.2	3	●	MDW 0220PHT	12.0	15.3	68.3	0.3	3.0	1
	10	●	0220XHGS10	35.1	38.4	88.4	0.4	3.0	2
	15	●	0220XHGS15	45.1	48.4	98.4	0.4	3.0	2
	20	●	0220XHGS20	58.1	61.4	111.4	0.4	3.0	2
	25	●	0220XHGS25	70.1	73.4	123.4	0.4	3.0	2
	30	●	0220XHGS30	83.1	86.4	136.4	0.4	3.0	2
2.3	3	●	MDW 0230PHT	11.9	15.3	68.3	0.3	3.0	1
	10	●	0230XHGS10	35.0	38.4	88.4	0.4	3.0	2
	15	●	0230XHGS15	45.0	48.4	98.4	0.4	3.0	2
	20	●	0230XHGS20	58.0	61.4	111.4	0.4	3.0	2
	25	●	0230XHGS25	70.0	73.4	123.4	0.4	3.0	2
	30	●	0230XHGS30	83.0	86.4	136.4	0.4	3.0	2
2.4	3	●	MDW 0240PHT	11.7	15.3	68.3	0.3	3.0	1
	10	●	0240XHGS10	34.8	38.4	88.4	0.4	3.0	2
	15	●	0240XHGS15	44.8	48.4	98.4	0.4	3.0	2
	20	●	0240XHGS20	57.8	61.4	111.4	0.4	3.0	2
	25	●	0240XHGS25	69.8	73.4	123.4	0.4	3.0	2
	30	●	0240XHGS30	82.8	86.4	136.4	0.4	3.0	2
2.5	3	●	MDW 0250PHT	11.6	15.3	68.3	0.3	3.0	1
	10	●	0250XHGS10	34.8	38.5	88.5	0.5	3.0	2
	12	●	0250XHGS12	37.8	41.5	91.5	0.5	3.0	2
	15	●	0250XHGS15	44.8	48.5	98.5	0.5	3.0	2
	20	●	0250XHGS20	57.8	61.5	111.5	0.5	3.0	2
	25	●	0250XHGS25	69.8	73.5	123.5	0.5	3.0	2
	30	●	0250XHGS30	82.8	86.5	136.5	0.5	3.0	2
2.6	3	●	MDW 0260PHT	13.9	17.8	68.3	0.3	3.0	1
	10	●	0260XHGS10	41.6	45.5	93.5	0.5	3.0	2
	12		0260XHGS12	47.6	51.5	99.5	0.5	3.0	2
	15	●	0260XHGS15	56.6	60.5	108.5	0.5	3.0	2
	20	●	0260XHGS20	71.6	75.5	123.5	0.5	3.0	2
	25	●	0260XHGS25	86.6	90.5	138.5	0.5	3.0	2
	30	●	0260XHGS30	101.6	105.5	153.5	0.5	3.0	2
2.7	3	●	MDW 0270PHT	13.9	17.9	68.4	0.4	3.0	1
	10	●	0270XHGS10	41.5	45.5	93.5	0.5	3.0	2
	12		0270XHGS12	47.5	51.5	99.5	0.5	3.0	2
	15	●	0270XHGS15	56.5	60.5	108.5	0.5	3.0	2
	20	●	0270XHGS20	71.5	75.5	123.5	0.5	3.0	2
	25	●	0270XHGS25	86.5	90.5	138.5	0.5	3.0	2
	30	●	0270XHGS30	101.5	105.5	153.5	0.5	3.0	2
2.8	3	●	MDW 0280PHT	13.7	17.9	68.4	0.4	3.0	1
	10	●	0280XHGS10	41.3	45.5	93.5	0.5	3.0	2
	12		0280XHGS12	47.3	51.5	99.5	0.5	3.0	2
	15	●	0280XHGS15	56.3	60.5	108.5	0.5	3.0	2
	20	●	0280XHGS20	71.3	75.5	123.5	0.5	3.0	2
	25	●	0280XHGS25	86.3	90.5	138.5	0.5	3.0	2
	30	●	0280XHGS30	101.3	105.5	153.5	0.5	3.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter ø2.9 to 3.6mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.9	3	●	MDW 0290PHT	13.6	17.9	68.4	0.4	3.0	1
	10	●	0290XHGS10	41.2	45.5	93.5	0.5	3.0	2
	12		0290XHGS12	47.2	51.5	99.5	0.5	3.0	2
	15	●	0290XHGS15	56.2	60.5	108.5	0.5	3.0	2
	20	●	0290XHGS20	71.2	75.5	123.5	0.5	3.0	2
	25	●	0290XHGS25	86.2	90.5	138.5	0.5	3.0	2
	30	●	0290XHGS30	101.2	105.5	153.5	0.5	3.0	2
3.0	3	●	MDW 0300PHT	13.4	17.9	68.4	0.4	3.0	1
	10	●	0300XHGS10	41.0	45.5	93.5	0.5	3.0	2
	12	●	0300XHGS12	47.0	51.5	99.5	0.5	3.0	2
	15	●	0300XHGS15	56.0	60.5	108.5	0.5	3.0	2
	20	●	0300XHGS20	71.0	75.5	123.5	0.5	3.0	2
	25	●	0300XHGS25	86.0	90.5	138.5	0.5	3.0	2
	30	●	0300XHGS30	101.0	105.5	153.5	0.5	3.0	2
3.1	3	●	MDW 0310PHT	15.8	20.4	72.4	0.4	4.0	1
	10	●	0310XHGS10	49.0	53.6	103.6	0.6	4.0	2
	12		0310XHGS12	54.0	58.6	108.6	0.6	4.0	2
	15	●	0310XHGS15	64.0	68.6	118.6	0.6	4.0	2
	20	●	0310XHGS20	82.0	86.6	136.6	0.6	4.0	2
	25	●	0310XHGS25	99.0	103.6	153.6	0.6	4.0	2
	30	●	0310XHGS30	117.0	121.6	171.6	0.6	4.0	2
3.2	3	●	MDW 0320PHT	15.6	20.4	72.4	0.4	4.0	1
	10	●	0320XHGS10	48.8	53.6	103.6	0.6	4.0	2
	12		0320XHGS12	53.8	58.6	108.6	0.6	4.0	2
	15	●	0320XHGS15	63.8	68.6	118.6	0.6	4.0	2
	20	●	0320XHGS20	81.8	86.6	136.6	0.6	4.0	2
	25	●	0320XHGS25	98.8	103.6	153.6	0.6	4.0	2
	30	●	0320XHGS30	116.8	121.6	171.6	0.6	4.0	2
3.3	3	●	MDW 0330PHT	15.5	20.4	72.4	0.4	4.0	1
	10	●	0330XHGS10	48.7	53.6	103.6	0.6	4.0	2
	12		0330XHGS12	53.7	58.6	108.6	0.6	4.0	2
	15	●	0330XHGS15	63.7	68.6	118.6	0.6	4.0	2
	20	●	0330XHGS20	81.7	86.6	136.6	0.6	4.0	2
	25	●	0330XHGS25	98.7	103.6	153.6	0.6	4.0	2
	30	●	0330XHGS30	116.7	121.6	171.6	0.6	4.0	2
3.4	3	●	MDW 0340PHT	15.4	20.5	72.5	0.5	4.0	1
	10	●	0340XHGS10	48.5	53.6	103.6	0.6	4.0	2
	12		0340XHGS12	53.5	58.6	108.6	0.6	4.0	2
	15	●	0340XHGS15	63.5	68.6	118.6	0.6	4.0	2
	20	●	0340XHGS20	81.5	86.6	136.6	0.6	4.0	2
	25	●	0340XHGS25	98.5	103.6	153.6	0.6	4.0	2
	30	●	0340XHGS30	116.5	121.6	171.6	0.6	4.0	2
3.5	3	●	MDW 0350PHT	15.3	20.5	72.5	0.5	4.0	1
	10	●	0350XHGS10	48.4	53.6	103.6	0.6	4.0	2
	12	●	0350XHGS12	53.4	58.6	108.6	0.6	4.0	2
	15	●	0350XHGS15	63.4	68.6	118.6	0.6	4.0	2
	20	●	0350XHGS20	81.4	86.6	136.6	0.6	4.0	2
	25	●	0350XHGS25	98.4	103.6	153.6	0.6	4.0	2
	30	●	0350XHGS30	116.4	121.6	171.6	0.6	4.0	2
3.6	3	●	MDW 0360PHT	17.6	23.0	72.5	0.5	4.0	1
	10	●	0360XHGS10	55.3	60.7	108.7	0.7	4.0	2
	12		0360XHGS12	63.3	68.7	116.7	0.7	4.0	2
	15	●	0360XHGS15	75.3	80.7	128.7	0.7	4.0	2
	20	●	0360XHGS20	95.3	100.7	148.7	0.7	4.0	2
	25	●	0360XHGS25	115.3	120.7	168.7	0.7	4.0	2
	30	●	0360XHGS30	135.3	140.7	188.7	0.7	4.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

XHGS series/PHT series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 10D | 12D | 15D | 20D | 25D | 30D | Pilot 3D

*Refer to N36 for the tolerance of h6, h8 and e8

Fig 1 (PHT series)

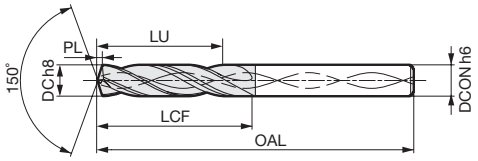
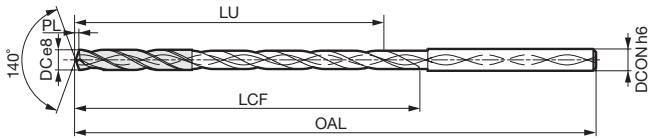


Fig 2 (XHGS series)



Diameter ø3.7 to 4.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3	●	MDW 0370PHT	17.5	23.0	72.5	0.5	4.0	1
	10	●	0370XHGS10	55.2	60.7	108.7	0.7	4.0	2
	12		0370XHGS12	63.2	68.7	116.7	0.7	4.0	2
3.7	15	●	0370XHGS15	75.2	80.7	128.7	0.7	4.0	2
	20	●	0370XHGS20	95.2	100.7	148.7	0.7	4.0	2
	25	●	0370XHGS25	115.2	120.7	168.7	0.7	4.0	2
	30	●	0370XHGS30	135.2	140.7	188.7	0.7	4.0	2
	3	●	MDW 0380PHT	17.3	23.0	72.5	0.5	4.0	1
	10	●	0380XHGS10	55.0	60.7	108.7	0.7	4.0	2
	12		0380XHGS12	63.0	68.7	116.7	0.7	4.0	2
3.8	15	●	0380XHGS15	75.0	80.7	128.7	0.7	4.0	2
	20	●	0380XHGS20	95.0	100.7	148.7	0.7	4.0	2
	25	●	0380XHGS25	115.0	120.7	168.7	0.7	4.0	2
	30	●	0380XHGS30	135.0	140.7	188.7	0.7	4.0	2
	3	●	MDW 0390PHT	17.2	23.0	72.5	0.5	4.0	1
	10	●	0390XHGS10	54.9	60.7	108.7	0.7	4.0	2
	12		0390XHGS12	62.9	68.7	116.7	0.7	4.0	2
3.9	15	●	0390XHGS15	74.9	80.7	128.7	0.7	4.0	2
	20	●	0390XHGS20	94.9	100.7	148.7	0.7	4.0	2
	25	●	0390XHGS25	114.9	120.7	168.7	0.7	4.0	2
	30	●	0390XHGS30	134.9	140.7	188.7	0.7	4.0	2
	3	●	MDW 0400PHT	17.0	23.0	72.5	0.5	4.0	1
	10	●	0400XHGS10	54.7	60.7	108.7	0.7	4.0	2
	12	●	0400XHGS12	62.7	68.7	116.7	0.7	4.0	2
4.0	15	●	0400XHGS15	74.7	80.7	128.7	0.7	4.0	2
	20	●	0400XHGS20	94.7	100.7	148.7	0.7	4.0	2
	25	●	0400XHGS25	114.7	120.7	168.7	0.7	4.0	2
	30	●	0400XHGS30	134.7	140.7	188.7	0.7	4.0	2
	3	●	MDW 0410PHT	19.4	25.5	80.5	0.5	5.0	1
	10	●	0410XHGS10	62.6	68.7	120.7	0.7	5.0	2
	12		0410XHGS12	69.6	75.7	127.7	0.7	5.0	2
4.1	15	●	0410XHGS15	82.6	88.7	140.7	0.7	5.0	2
	20	●	0410XHGS20	105.6	111.7	163.7	0.7	5.0	2
	25	●	0410XHGS25	127.6	133.7	185.7	0.7	5.0	2
	30	●	0410XHGS30	150.6	156.7	208.7	0.7	5.0	2
	3	●	MDW 0420PHT	19.3	25.6	80.6	0.6	5.0	1
	10	●	0420XHGS10	62.5	68.8	120.8	0.8	5.0	2
	12		0420XHGS12	69.5	75.8	127.8	0.8	5.0	2
4.2	15	●	0420XHGS15	82.5	88.8	140.8	0.8	5.0	2
	20	●	0420XHGS20	105.5	111.8	163.8	0.8	5.0	2
	25	●	0420XHGS25	127.5	133.8	185.8	0.8	5.0	2
	30	●	0420XHGS30	150.5	156.8	208.8	0.8	5.0	2
	3	●	MDW 0430PHT	19.2	25.6	80.6	0.6	5.0	1
	10	●	0430XHGS10	62.4	68.8	120.8	0.8	5.0	2
	12		0430XHGS12	69.4	75.8	127.8	0.8	5.0	2
4.3	15	●	0430XHGS15	82.4	88.8	140.8	0.8	5.0	2
	20	●	0430XHGS20	105.4	111.8	163.8	0.8	5.0	2
	25	●	0430XHGS25	127.4	133.8	185.8	0.8	5.0	2
	30	●	0430XHGS30	150.4	156.8	208.8	0.8	5.0	2
	3	●	MDW 0440PHT	19.0	25.6	80.6	0.6	5.0	1
	10	●	0440XHGS10	62.2	68.8	120.8	0.8	5.0	2
	12		0440XHGS12	69.2	75.8	127.8	0.8	5.0	2
4.4	15	●	0440XHGS15	82.2	88.8	140.8	0.8	5.0	2
	20	●	0440XHGS20	105.2	111.8	163.8	0.8	5.0	2
	25	●	0440XHGS25	127.2	133.8	185.8	0.8	5.0	2
	30	●	0440XHGS30	150.2	156.8	208.8	0.8	5.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter ø4.5 to 5.2mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3	●	MDW 0450PHT	18.9	25.6	80.6	0.6	5.0	1
	10	●	0450XHGS10	62.1	68.8	120.8	0.8	5.0	2
	12	●	0450XHGS12	69.1	75.8	127.8	0.8	5.0	2
4.5	15	●	0450XHGS15	82.1	88.8	140.8	0.8	5.0	2
	20	●	0450XHGS20	105.1	111.8	163.8	0.8	5.0	2
	25	●	0450XHGS25	127.1	133.8	185.8	0.8	5.0	2
	30	●	0450XHGS30	150.1	156.8	208.8	0.8	5.0	2
	3	●	MDW 0460PHT	21.2	28.1	80.6	0.6	5.0	1
	10	●	0460XHGS10	68.9	75.8	125.8	0.8	5.0	2
	12		0460XHGS12	78.9	85.8	135.8	0.8	5.0	2
4.6	15	●	0460XHGS15	93.9	100.8	150.8	0.8	5.0	2
	20	●	0460XHGS20	118.9	125.8	175.8	0.8	5.0	2
	25	●	0460XHGS25	143.9	150.8	200.8	0.8	5.0	2
	30	●	0460XHGS30	168.9	175.8	225.8	0.8	5.0	2
	3	●	MDW 0470PHT	21.1	28.1	80.6	0.6	5.0	1
	10	●	0470XHGS10	68.9	75.9	125.9	0.9	5.0	2
	12		0470XHGS12	78.9	85.9	135.9	0.9	5.0	2
4.7	15	●	0470XHGS15	93.9	100.9	150.9	0.9	5.0	2
	20	●	0470XHGS20	118.9	125.9	175.9	0.9	5.0	2
	25	●	0470XHGS25	143.9	150.9	200.9	0.9	5.0	2
	30	●	0470XHGS30	168.9	175.9	225.9	0.9	5.0	2
	3	●	MDW 0480PHT	20.9	28.1	80.6	0.6	5.0	1
	10	●	0480XHGS10	68.7	75.9	125.9	0.9	5.0	2
	12		0480XHGS12	78.7	85.9	135.9	0.9	5.0	2
4.8	15	●	0480XHGS15	93.7	100.9	150.9	0.9	5.0	2
	20	●	0480XHGS20	118.7	125.9	175.9	0.9	5.0	2
	25	●	0480XHGS25	143.7	150.9	200.9	0.9	5.0	2
	30	●	0480XHGS30	168.7	175.9	225.9	0.9	5.0	2
	3	●	MDW 0490PHT	20.9	28.2	80.7	0.7	5.0	1
	10	●	0490XHGS10	68.6	75.9	125.9	0.9	5.0	2
	12		0490XHGS12	78.6	85.9	135.9	0.9	5.0	2
4.9	15	●	0490XHGS15	93.6	100.9	150.9	0.9	5.0	2
	20	●	0490XHGS20	118.6	125.9	175.9	0.9	5.0	2
	25	●	0490XHGS25	143.6	150.9	200.9	0.9	5.0	2
	30	●	0490XHGS30	168.6	175.9	225.9	0.9	5.0	2
	3	●	MDW 0500PHT	20.7	28.2	80.7	0.7	5.0	1
	10	●	0500XHGS10	68.4	75.9	125.9	0.9	5.0	2
	12	●	0500XHGS12	78.4	85.9	135.9	0.9	5.0	2
5.0	15	●	0500XHGS15	93.4	100.9	150.9	0.9	5.0	2
	20	●	0500XHGS20	118.4	125.9	175.9	0.9	5.0	2
	25	●	0500XHGS25	143.4	150.9	200.9	0.9	5.0	2
	30	●	0500XHGS30	168.4	175.9	225.9	0.9	5.0	2
	3	●	MDW 0510PHT	20.6	28.2	82.7	0.7	6.0	1
	10	●	0510XHGS10	76.3	83.9	137.9	0.9	6.0	2
	12		0510XHGS12	85.3	92.9	146.9	0.9	6.0	2
5.1	15	●	0510XHGS15	101.3	108.9	162.9	0.9	6.0	2
	20	●	0510XHGS20	131.3	138.9	192.9	0.9	6.0	2
	25	●	0510XHGS25	156.3	163.9	217.9	0.9	6.0	2
	30	●	0510XHGS30	184.3	191.9	245.9	0.9	6.0	2
	3	●	MDW 0520PHT	20.4	28.2	82.7	0.7	6.0	1
	10	●	0520XHGS10	76.1	83.9	137.9	0.9	6.0	2
	12		0520XHGS12	85.1	92.9	146.9	0.9	6.0	2
5.2	15	●	0520XHGS15	101.1	108.9	162.9	0.9	6.0	2
	20	●	0520XHGS20	131.1	138.9	192.9	0.9	6.0	2
	25	●	0520XHGS25	156.1	163.9	217.9	0.9	6.0	2
	30	●	0520XHGS30	184.1	191.9	245.9	0.9	6.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

XHGS series/PHT series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 10D | 12D | 15D | 20D | 25D | 30D | Pilot 3D

*Refer to N36 for the tolerance of h6, h8 and e8

Fig 1 (PHT series)

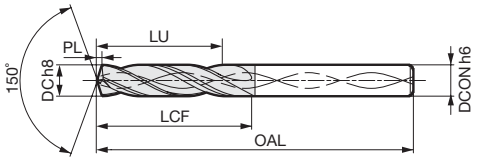
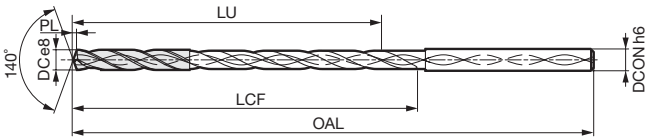


Fig 2 (XHGS series)



Diameter ø5.3 to 5.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
5.3	3	●	**MDW 0530PHT**	20.3	28.2	82.7	0.7	6.0	1
	10	●	**0530XHGS10**	76.1	84.0	138.0	1.0	6.0	2
	12		**0530XHGS12**	85.1	93.0	147.0	1.0	6.0	2
	15	●	**0530XHGS15**	101.1	109.0	163.0	1.0	6.0	2
	20	●	**0530XHGS20**	131.1	139.0	193.0	1.0	6.0	2
	25	●	**0530XHGS25**	156.1	164.0	218.0	1.0	6.0	2
	30	●	**0530XHGS30**	184.1	192.0	246.0	1.0	6.0	2
5.4	3	●	**MDW 0540PHT**	20.1	28.2	82.7	0.7	6.0	1
	10	●	**0540XHGS10**	75.9	84.0	138.0	1.0	6.0	2
	12		**0540XHGS12**	84.9	93.0	147.0	1.0	6.0	2
	15	●	**0540XHGS15**	100.9	109.0	163.0	1.0	6.0	2
	20	●	**0540XHGS20**	130.9	139.0	193.0	1.0	6.0	2
	25	●	**0540XHGS25**	155.9	164.0	218.0	1.0	6.0	2
	30	●	**0540XHGS30**	183.9	192.0	246.0	1.0	6.0	2
5.5	3	●	**MDW 0550PHT**	20.0	28.2	82.7	0.7	6.0	1
	10	●	**0550XHGS10**	75.8	84.0	138.0	1.0	6.0	2
	12	●	**0550XHGS12**	84.8	93.0	147.0	1.0	6.0	2
	15	●	**0550XHGS15**	100.8	109.0	163.0	1.0	6.0	2
	20	●	**0550XHGS20**	130.8	139.0	193.0	1.0	6.0	2
	25	●	**0550XHGS25**	155.8	164.0	218.0	1.0	6.0	2
	30	●	**0550XHGS30**	183.8	192.0	246.0	1.0	6.0	2
5.6	3	●	**MDW 0560PHT**	22.4	30.8	82.8	0.8	6.0	1
	10	●	**0560XHGS10**	82.6	91.0	143.0	1.0	6.0	2
	12		**0560XHGS12**	94.6	103.0	155.0	1.0	6.0	2
	15	●	**0560XHGS15**	112.6	121.0	173.0	1.0	6.0	2
	20	●	**0560XHGS20**	142.6	151.0	203.0	1.0	6.0	2
	25	●	**0560XHGS25**	172.6	181.0	233.0	1.0	6.0	2
	30	●	**0560XHGS30**	202.6	211.0	263.0	1.0	6.0	2
5.7	3	●	**MDW 0570PHT**	22.3	30.8	82.8	0.8	6.0	1
	10	●	**0570XHGS10**	82.5	91.0	143.0	1.0	6.0	2
	12		**0570XHGS12**	94.5	103.0	155.0	1.0	6.0	2
	15	●	**0570XHGS15**	112.5	121.0	173.0	1.0	6.0	2
	20	●	**0570XHGS20**	142.5	151.0	203.0	1.0	6.0	2
	25	●	**0570XHGS25**	172.5	181.0	233.0	1.0	6.0	2
	30	●	**0570XHGS30**	202.5	211.0	263.0	1.0	6.0	2
5.8	3	●	**MDW 0580PHT**	22.1	30.8	82.8	0.8	6.0	1
	10	●	**0580XHGS10**	82.4	91.1	143.1	1.1	6.0	2
	12		**0580XHGS12**	94.4	103.1	155.1	1.1	6.0	2
	15	●	**0580XHGS15**	112.4	121.1	173.1	1.1	6.0	2
	20	●	**0580XHGS20**	142.4	151.1	203.1	1.1	6.0	2
	25	●	**0580XHGS25**	172.4	181.1	233.1	1.1	6.0	2
	30	●	**0580XHGS30**	202.4	211.1	263.1	1.1	6.0	2
5.9	3	●	**MDW 0590PHT**	22.0	30.8	82.8	0.8	6.0	1
	10	●	**0590XHGS10**	82.3	91.1	143.1	1.1	6.0	2
	12		**0590XHGS12**	94.3	103.1	155.1	1.1	6.0	2
	15	●	**0590XHGS15**	112.3	121.1	173.1	1.1	6.0	2
	20	●	**0590XHGS20**	142.3	151.1	203.1	1.1	6.0	2
	25	●	**0590XHGS25**	172.3	181.1	233.1	1.1	6.0	2
	30	●	**0590XHGS30**	202.3	211.1	263.1	1.1	6.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter ø6.0 to 6.6mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.0	3	●	**MDW 0600PHT**	21.8	30.8	82.8	0.8	6.0	1
	10	●	**0600XHGS10**	82.1	91.1	143.1	1.1	6.0	2
	12	●	**0600XHGS12**	94.1	103.1	155.1	1.1	6.0	2
	15	●	**0600XHGS15**	112.1	121.1	173.1	1.1	6.0	2
	20	●	**0600XHGS20**	142.1	151.1	203.1	1.1	6.0	2
	25	●	**0600XHGS25**	172.1	181.1	233.1	1.1	6.0	2
	30	●	**0600XHGS30**	202.1	211.1	263.1	1.1	6.0	2
6.1	3	●	**MDW 0610PHT**	24.2	33.3	88.8	0.8	7.0	1
	10	●	**0610XHGS10**	90.0	99.1	154.1	1.1	7.0	2
	12		**0610XHGS12**	101.0	110.1	165.1	1.1	7.0	2
	15	●	**0610XHGS15**	120.0	129.1	184.1	1.1	7.0	2
	20	●	**0610XHGS20**	153.0	162.1	217.1	1.1	7.0	2
	25	●	**0610XHGS25**	185.0	194.1	249.1	1.1	7.0	2
	30	●	**0610XHGS30**	218.0	227.1	282.1	1.1	7.0	2
6.2	3	●	**MDW 0620PHT**	24.0	33.3	88.8	0.8	7.0	1
	10	●	**0620XHGS10**	89.8	99.1	154.1	1.1	7.0	2
	12		**0620XHGS12**	100.8	110.1	165.1	1.1	7.0	2
	15	●	**0620XHGS15**	119.8	129.1	184.1	1.1	7.0	2
	20	●	**0620XHGS20**	152.8	162.1	217.1	1.1	7.0	2
	25	●	**0620XHGS25**	184.8	194.1	249.1	1.1	7.0	2
	30	●	**0620XHGS30**	217.8	227.1	282.1	1.1	7.0	2
6.3	3	●	**MDW 0630PHT**	23.9	33.3	88.8	0.8	7.0	1
	10	●	**0630XHGS10**	89.7	99.1	154.1	1.1	7.0	2
	12		**0630XHGS12**	100.7	110.1	165.1	1.1	7.0	2
	15	●	**0630XHGS15**	119.7	129.1	184.1	1.1	7.0	2
	20	●	**0630XHGS20**	152.7	162.1	217.1	1.1	7.0	2
	25	●	**0630XHGS25**	184.7	194.1	249.1	1.1	7.0	2
	30	●	**0630XHGS30**	217.7	227.1	282.1	1.1	7.0	2
6.4	3	●	**MDW 0640PHT**	23.8	33.4	88.9	0.9	7.0	1
	10	●	**0640XHGS10**	89.6	99.2	154.2	1.2	7.0	2
	12		**0640XHGS12**	100.6	110.2	165.2	1.2	7.0	2
	15	●	**0640XHGS15**	119.6	129.2	184.2	1.2	7.0	2
	20	●	**0640XHGS20**	152.6	162.2	217.2	1.2	7.0	2
	25	●	**0640XHGS25**	184.6	194.2	249.2	1.2	7.0	2
	30	●	**0640XHGS30**	217.6	227.2	282.2	1.2	7.0	2
6.5	3	●	**MDW 0650PHT**	23.7	33.4	88.9	0.9	7.0	1
	10	●	**0650XHGS10**	89.5	99.2	154.2	1.2	7.0	2
	12	●	**0650XHGS12**	100.5	110.2	165.2	1.2	7.0	2
	15	●	**0650XHGS15**	119.5	129.2	184.2	1.2	7.0	2
	20	●	**0650XHGS20**	152.5	162.2	217.2	1.2	7.0	2
	25	●	**0650XHGS25**	184.5	194.2	249.2	1.2	7.0	2
	30	●	**0650XHGS30**	217.5	227.2	282.2	1.2	7.0	2
6.6	3	●	**MDW 0660PHT**	26.0	35.9	88.9	0.9	7.0	1
	10	●	**0660XHGS10**	96.3	106.2	159.2	1.2	7.0	2
	12		**0660XHGS12**	110.3	120.2	173.2	1.2	7.0	2
	15	●	**0660XHGS15**	131.3	141.2	194.2	1.2	7.0	2
	20	●	**0660XHGS20**	166.3	176.2	229.2	1.2	7.0	2
	25	●	**0660XHGS25**	201.3	211.2	264.2	1.2	7.0	2
	30	●	**0660XHGS30**	236.3	246.2	299.2	1.2	7.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

XHGS series/PHT series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 10D | 12D | 15D | 20D | 25D | 30D | Pilot 3D

*Refer to N36 for the tolerance of h6, h8 and e8

Fig 1 (PHT series)

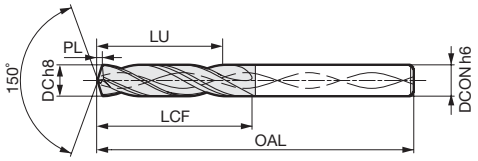
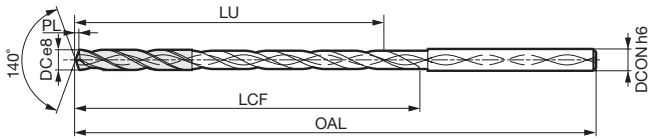


Fig 2 (XHGS series)



Diameter ø6.7 to 7.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3	●	MDW 0670PHT	25.9	35.9	88.9	0.9	7.0	1
	10	●	0670XHGS10	96.2	106.2	159.2	1.2	7.0	2
	12		0670XHGS12	110.2	120.2	173.2	1.2	7.0	2
6.7	15	●	0670XHGS15	131.2	141.2	194.2	1.2	7.0	2
	20	●	0670XHGS20	166.2	176.2	229.2	1.2	7.0	2
	25	●	0670XHGS25	201.2	211.2	264.2	1.2	7.0	2
	30	●	0670XHGS30	236.2	246.2	299.2	1.2	7.0	2
	3	●	MDW 0680PHT	25.7	35.9	88.9	0.9	7.0	1
	10	●	0680XHGS10	96.0	106.2	159.2	1.2	7.0	2
	12		0680XHGS12	110.0	120.2	173.2	1.2	7.0	2
6.8	15	●	0680XHGS15	131.0	141.2	194.2	1.2	7.0	2
	20	●	0680XHGS20	166.0	176.2	229.2	1.2	7.0	2
	25	●	0680XHGS25	201.0	211.2	264.2	1.2	7.0	2
	30	●	0680XHGS30	236.0	246.2	299.2	1.2	7.0	2
	3	●	MDW 0690PHT	25.6	35.9	88.9	0.9	7.0	1
	10	●	0690XHGS10	96.0	106.3	159.3	1.3	7.0	2
	12		0690XHGS12	110.0	120.3	173.3	1.3	7.0	2
6.9	15	●	0690XHGS15	131.0	141.3	194.3	1.3	7.0	2
	20	●	0690XHGS20	166.0	176.3	229.3	1.3	7.0	2
	25	●	0690XHGS25	201.0	211.3	264.3	1.3	7.0	2
	30	●	0690XHGS30	236.0	246.3	299.3	1.3	7.0	2
	3	●	MDW 0700PHT	25.4	35.9	88.9	0.9	7.0	1
	10	●	0700XHGS10	95.8	106.3	159.3	1.3	7.0	2
	12	●	0700XHGS12	109.8	120.3	173.3	1.3	7.0	2
7.0	15	●	0700XHGS15	130.8	141.3	194.3	1.3	7.0	2
	20	●	0700XHGS20	165.8	176.3	229.3	1.3	7.0	2
	25	●	0700XHGS25	200.8	211.3	264.3	1.3	7.0	2
	30	●	0700XHGS30	235.8	246.3	299.3	1.3	7.0	2
	3	●	MDW 0710PHT	27.9	38.5	95.0	1.0	8.0	1
	10	●	0710XHGS10	103.7	114.3	170.3	1.3	8.0	2
	12		0710XHGS12	116.7	127.3	183.3	1.3	8.0	2
7.1	15	●	0710XHGS15	138.7	149.3	205.3	1.3	8.0	2
	20	●	0710XHGS20	176.7	187.3	243.3	1.3	8.0	2
	25	●	0710XHGS25	213.7	224.3	280.3	1.3	8.0	2
	30	●	0710XHGS30	251.7	262.3	318.3	1.3	8.0	2
	3	●	MDW 0720PHT	27.7	38.5	95.0	1.0	8.0	1
	10	●	0720XHGS10	103.5	114.3	170.3	1.3	8.0	2
	12		0720XHGS12	116.5	127.3	183.3	1.3	8.0	2
7.2	15	●	0720XHGS15	138.5	149.3	205.3	1.3	8.0	2
	20	●	0720XHGS20	176.5	187.3	243.3	1.3	8.0	2
	25	●	0720XHGS25	213.5	224.3	280.3	1.3	8.0	2
	30	●	0720XHGS30	251.5	262.3	318.3	1.3	8.0	2
	3	●	MDW 0730PHT	27.6	38.5	95.0	1.0	8.0	1
	10	●	0730XHGS10	103.4	114.3	170.3	1.3	8.0	2
	12		0730XHGS12	116.4	127.3	183.3	1.3	8.0	2
7.3	15	●	0730XHGS15	138.4	149.3	205.3	1.3	8.0	2
	20	●	0730XHGS20	176.4	187.3	243.3	1.3	8.0	2
	25	●	0730XHGS25	213.4	224.3	280.3	1.3	8.0	2
	30	●	0730XHGS30	251.4	262.3	318.3	1.3	8.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter ø7.4 to 8.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3	●	MDW 0740PHT	27.4	38.5	95.0	1.0	8.0	1
	10	●	0740XHGS10	103.2	114.3	170.3	1.3	8.0	2
	12		0740XHGS12	116.2	127.3	183.3	1.3	8.0	2
7.4	15	●	0740XHGS15	138.2	149.3	205.3	1.3	8.0	2
	20	●	0740XHGS20	176.2	187.3	243.3	1.3	8.0	2
	25	●	0740XHGS25	213.2	224.3	280.3	1.3	8.0	2
	30	●	0740XHGS30	251.2	262.3	318.3	1.3	8.0	2
	3	●	MDW 0750PHT	27.3	38.5	95.0	1.0	8.0	1
	10	●	0750XHGS10	103.2	114.4	170.4	1.4	8.0	2
	12	●	0750XHGS12	116.2	127.4	183.4	1.4	8.0	2
7.5	15	●	0750XHGS15	138.2	149.4	205.4	1.4	8.0	2
	20	●	0750XHGS20	176.2	187.4	243.4	1.4	8.0	2
	25	●	0750XHGS25	213.2	224.4	280.4	1.4	8.0	2
	30	●	0750XHGS30	251.2	262.4	318.4	1.4	8.0	2
	3	●	MDW 0760PHT	29.6	41.0	95.0	1.0	8.0	1
	10	●	0760XHGS10	110.0	121.4	175.4	1.4	8.0	2
	12		0760XHGS12	126.0	137.4	191.4	1.4	8.0	2
7.6	15	●	0760XHGS15	150.0	161.4	215.4	1.4	8.0	2
	20	●	0760XHGS20	190.0	201.4	255.4	1.4	8.0	2
	25	●	0760XHGS25	230.0	241.4	295.4	1.4	8.0	2
	30	●	0760XHGS30	270.0	281.4	335.4	1.4	8.0	2
	3	●	MDW 0770PHT	29.5	41.0	95.0	1.0	8.0	1
	10	●	0770XHGS10	109.9	121.4	175.4	1.4	8.0	2
	12		0770XHGS12	125.9	137.4	191.4	1.4	8.0	2
7.7	15	●	0770XHGS15	149.9	161.4	215.4	1.4	8.0	2
	20	●	0770XHGS20	189.9	201.4	255.4	1.4	8.0	2
	25	●	0770XHGS25	229.9	241.4	295.4	1.4	8.0	2
	30	●	0770XHGS30	269.9	281.4	335.4	1.4	8.0	2
	3	●	MDW 0780PHT	29.3	41.0	95.0	1.0	8.0	1
	10	●	0780XHGS10	109.7	121.4	175.4	1.4	8.0	2
	12		0780XHGS12	125.7	137.4	191.4	1.4	8.0	2
7.8	15	●	0780XHGS15	149.7	161.4	215.4	1.4	8.0	2
	20	●	0780XHGS20	189.7	201.4	255.4	1.4	8.0	2
	25	●	0780XHGS25	229.7	241.4	295.4	1.4	8.0	2
	30	●	0780XHGS30	269.7	281.4	335.4	1.4	8.0	2
	3	●	MDW 0790PHT	29.3	41.1	95.1	1.1	8.0	1
	10	●	0790XHGS10	109.6	121.4	175.4	1.4	8.0	2
	12		0790XHGS12	125.6	137.4	191.4	1.4	8.0	2
7.9	15	●	0790XHGS15	149.6	161.4	215.4	1.4	8.0	2
	20	●	0790XHGS20	189.6	201.4	255.4	1.4	8.0	2
	25	●	0790XHGS25	229.6	241.4	295.4	1.4	8.0	2
	30	●	0790XHGS30	269.6	281.4	335.4	1.4	8.0	2
	3	●	MDW 0800PHT	29.1	41.1	95.1	1.1	8.0	1
	10	●	0800XHGS10	109.5	121.5	175.5	1.5	8.0	2
	12	●	0800XHGS12	125.5	137.5	191.5	1.5	8.0	2
8.0	15	●	0800XHGS15	149.5	161.5	215.5	1.5	8.0	2
	20	●	0800XHGS20	189.5	201.5	255.5	1.5	8.0	2
	25	●	0800XHGS25	229.5	241.5	295.5	1.5	8.0	2
	30	●	0800XHGS30	269.5	281.5	335.5	1.5	8.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

XHGS series/PHT series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 10D | 12D | 15D | 20D | 25D | 30D | Pilot 3D

*Refer to N36 for the tolerance of h6, h8 and e8

Fig 1 (PHT series)

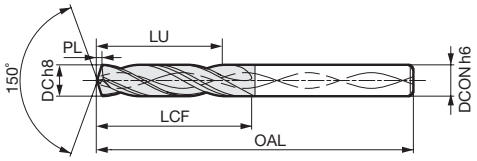
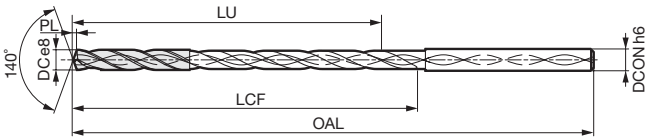


Fig 2 (XHGS series)



Diameter ø8.5 to 11.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.5	3	●	MDW 0850PHT	30.9	43.6	101.1	1.1	9.0	1
	10	●	0850XHGS10	116.8	129.5	186.5	1.5	9.0	2
	12	●	0850XHGS12	131.8	144.5	201.5	1.5	9.0	2
	15	●	0850XHGS15	156.8	169.5	226.5	1.5	9.0	2
	20	●	0850XHGS20	199.8	212.5	269.5	1.5	9.0	2
	25	●	0850XHGS25	241.8	254.5	311.5	1.5	9.0	2
	30	●	0850XHGS30	284.8	297.5	354.5	1.5	9.0	2
9.0	3	●	MDW 0900PHT	32.7	46.2	101.2	1.2	9.0	1
	10	●	0900XHGS10	123.1	136.6	191.6	1.6	9.0	2
	12	●	0900XHGS12	141.1	154.6	209.6	1.6	9.0	2
	15	●	0900XHGS15	168.1	181.6	236.6	1.6	9.0	2
	20	●	0900XHGS20	213.1	226.6	281.6	1.6	9.0	2
	25	●	0900XHGS25	258.1	271.6	326.6	1.6	9.0	2
	30	●	0900XHGS30	303.1	316.6	371.6	1.6	9.0	2
9.5	3	●	MDW 0950PHT	34.6	48.8	107.3	1.3	10.0	1
	10	●	0950XHGS10	130.5	144.7	202.7	1.7	10.0	2
	12	●	0950XHGS12	147.5	161.7	219.7	1.7	10.0	2
	15	●	0950XHGS15	175.5	189.7	247.7	1.7	10.0	2
	20	●	0950XHGS20	223.5	237.7	295.7	1.7	10.0	2
	25	●	0950XHGS25	270.5	284.7	342.7	1.7	10.0	2
	30	●	0950XHGS30	318.5	332.7	390.7	1.7	10.0	2
10.0	3	●	MDW 1000PHT	36.3	51.3	107.3	1.3	10.0	1
	10	●	1000XHGS10	136.8	151.8	207.8	1.8	10.0	2
	12	●	1000XHGS12	156.8	171.8	227.8	1.8	10.0	2
	15	●	1000XHGS15	186.8	201.8	257.8	1.8	10.0	2
	20	●	1000XHGS20	236.8	251.8	307.8	1.8	10.0	2
	25	●	1000XHGS25	286.8	301.8	357.8	1.8	10.0	2
	30	●	1000XHGS30	336.8	351.8	407.8	1.8	10.0	2
10.5	3	●	MDW 1050PHT	38.2	53.9	117.4	1.4	11.0	1
	10	●	1050XHGS10	144.2	159.9	222.9	1.9	11.0	2
	12	●	1050XHGS12	163.2	178.9	241.9	1.9	11.0	2
	15	●	1050XHGS15	194.2	209.9	272.9	1.9	11.0	2
	20	●	1050XHGS20	247.2	262.9	325.9	1.9	11.0	2
	25	●	1050XHGS25	299.2	314.9	377.9	1.9	11.0	2
11.0	3	●	MDW 1100PHT	40.0	56.5	117.5	1.5	11.0	1
	10	●	1100XHGS10	150.5	167.0	228.0	2.0	11.0	2
	12	●	1100XHGS12	172.5	189.0	250.0	2.0	11.0	2
	15	●	1100XHGS15	205.5	222.0	283.0	2.0	11.0	2
	20	●	1100XHGS20	260.5	277.0	338.0	2.0	11.0	2
	25	●	1100XHGS25	315.5	332.0	393.0	2.0	11.0	2
11.5	3	●	MDW 1150PHT	41.8	59.0	123.5	1.5	12.0	1
	10	●	1150XHGS10	157.9	175.1	239.1	2.1	12.0	2
	12	●	1150XHGS12	178.9	196.1	260.1	2.1	12.0	2
	15	●	1150XHGS15	212.9	230.1	294.1	2.1	12.0	2
	20	●	1150XHGS20	270.9	288.1	352.1	2.1	12.0	2
	25	●	1150XHGS25	327.9	345.1	409.1	2.1	12.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

Diameter ø12.0 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
12.0	3	●	MDW 1200PHT	43.6	61.6	123.6	1.6	12.0	1
	10	●	1200XHGS10	164.2	182.2	244.2	2.2	12.0	2
	12	●	1200XHGS12	188.2	206.2	268.2	2.2	12.0	2
	15	●	1200XHGS15	224.2	242.2	304.2	2.2	12.0	2
	20	●	1200XHGS20	284.2	302.2	364.2	2.2	12.0	2
	25	●	1200XHGS25	344.2	362.2	424.2	2.2	12.0	2
12.5	3	●	MDW 1250PHT	45.5	64.2	129.7	1.7	13.0	1
	10	●	1250XHGS10	171.6	190.3	255.3	2.3	13.0	2
	12	●	1250XHGS12	194.6	213.3	278.3	2.3	13.0	2
	15	●	1250XHGS15	231.6	250.3	315.3	2.3	13.0	2
	20	●	1250XHGS20	294.6	313.3	378.3	2.3	13.0	2
13.0	3	●	MDW 1300PHT	47.2	66.7	129.7	1.7	13.0	1
	10	●	1300XHGS10	177.9	197.4	260.4	2.4	13.0	2
	12	●	1300XHGS12	203.9	223.4	286.4	2.4	13.0	2
	15	●	1300XHGS15	242.9	262.4	325.4	2.4	13.0	2
	20	●	1300XHGS20	307.9	327.4	390.4	2.4	13.0	2
13.5	3	●	MDW 1350PHT	49.1	69.3	135.8	1.8	14.0	1
	10	●	1350XHGS10	185.3	205.5	271.5	2.5	14.0	2
	12	●	1350XHGS12	210.3	230.5	296.5	2.5	14.0	2
	15	●	1350XHGS15	250.3	270.5	336.5	2.5	14.0	2
	20	●	1350XHGS20	318.3	338.5	404.5	2.5	14.0	2
14.0	3	●	MDW 1400PHT	50.9	71.9	135.9	1.9	14.0	1
	10	●	1400XHGS10	191.5	212.5	276.5	2.5	14.0	2
	12	●	1400XHGS12	219.5	240.5	304.5	2.5	14.0	2
	15	●	1400XHGS15	261.5	282.5	346.5	2.5	14.0	2
	20	●	1400XHGS20	331.5	352.5	416.5	2.5	14.0	2
14.5	3	●	MDW 1450PHT	52.7	74.4	141.9	1.9	15.0	1
	10	●	1450XHGS10	198.9	220.6	287.6	2.6	15.0	2
	12	●	1450XHGS12	225.9	247.6	314.6	2.6	15.0	2
	15	●	1450XHGS15	268.9	290.6	357.6	2.6	15.0	2
15.0	3	●	MDW 1500PHT	54.5	77.0	142.0	2.0	15.0	1
	10	●	1500XHGS10	205.2	227.7	292.7	2.7	15.0	2
	12	●	1500XHGS12	235.2	257.7	322.7	2.7	15.0	2
	15	●	1500XHGS15	280.2	302.7	367.7	2.7	15.0	2
15.5	3	●	MDW 1550PHT	56.4	79.6	148.1	2.1	16.0	1
	10	●	1550XHGS10	212.6	235.8	303.8	2.8	16.0	2
	12	●	1550XHGS12	241.6	264.8	332.8	2.8	16.0	2
	15	●	1550XHGS15	287.6	310.8	378.8	2.8	16.0	2
16.0	3	●	MDW 1600PHT	58.1	82.1	148.1	2.1	16.0	1
	10	●	1600XHGS10	218.9	242.9	308.9	2.9	16.0	2
	12	●	1600XHGS12	248.9	272.9	340.9	2.9	16.0	2
	15	●	1600XHGS15	298.9	322.9	388.9	2.9	16.0	2

Part Number Suffix - PHT: For Guide Hole
Grade: ACX70 (XHGS series) / ACX20 (PHT series)

XHGS series/PHT series (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron

DEX Coat | Coolant Hole | 10D | 12D | 15D | 20D | 25D | 30D | Pilot 3D

*Refer to N36 for the tolerance of h6, h8 and e8

Fig 1 (PHT series)

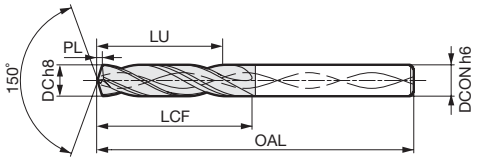
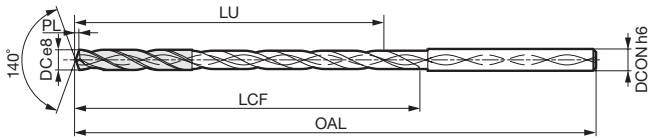


Fig 2 (XHGS series)



Made-to-order items: Inquire about production of drills in tool diameters and lengths that are not listed in the dimensions at left or not in stock.

Recommended Cutting Conditions (n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel (up to 200HB)	General Steel (up to 250HB)	Alloy Steel (up to 300HB)	Hardened Steel (up to 40HRC)	Grey Cast Iron Ductile Cast Iron
ø3.0	n	6,400	8,500	5,800	4,200	5,800
	vc	50 - **60** - 80	60 - **80** - 100	40 - **55** - 70	30 - **40** - 50	40 - **55** - 70
	f	0.12 - **0.15** - 0.20	0.12 - **0.15** - 0.20	0.10 - **0.13** - 0.16	0.06 - **0.08** - 0.12	0.15 - **0.18** - 0.23
ø5.0	n	3,800	5,100	3,800	2,900	3,800
	vc	50 - **60** - 80	60 - **80** - 100	50 - **60** - 70	30 - **45** - 55	50 - **60** - 70
	f	0.15 - **0.20** - 0.25	0.15 - **0.23** - 0.30	0.12 - **0.15** - 0.20	0.08 - **0.10** - 0.14	0.17 - **0.25** - 0.35
ø10.0	n	2,200	2,500	2,100	1,600	2,100
	vc	50 - **70** - 90	60 - **80** - 110	50 - **65** - 80	30 - **50** - 60	50 - **65** - 80
	f	0.20 - **0.25** - 0.30	0.20 - **0.25** - 0.32	0.15 - **0.20** - 0.25	0.10 - **0.15** - 0.20	0.25 - **0.28** - 0.35
ø16.0	n	1,600	1,800	1,300	1,100	1,300
	vc	60 - **80** - 100	60 - **90** - 120	50 - **65** - 80	40 - **55** - 70	50 - **65** - 80
	f	0.25 - **0.30** - 0.35	0.25 - **0.30** - 0.35	0.15 - **0.23** - 0.27	0.12 - **0.15** - 0.23	0.25 - **0.30** - 0.35

Note: Use lower speed when using MQL coolant, and higher speed when using internal coolant supply or dual-liquid mist. Min. - **Optimum** - Max.

MDA series

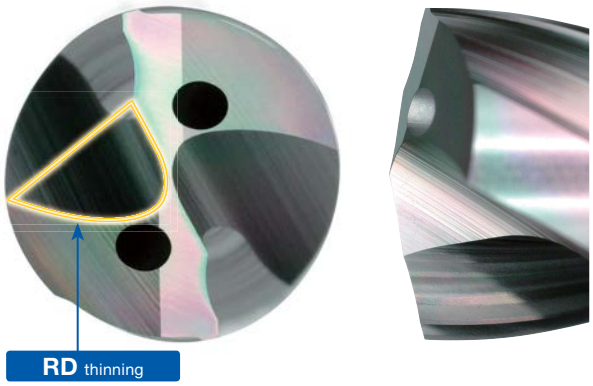
New

■ Features

- Venturing into new regions of aluminum alloy drilling
  Covers a wide application range from high-precision to high-efficiency drilling
- New DLC Coat and AURORA Coat X adopted

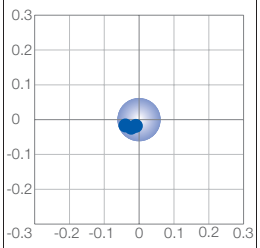
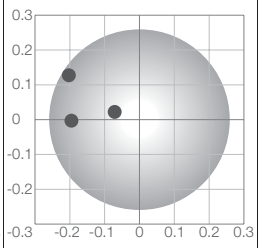
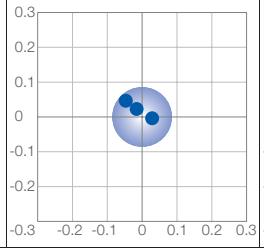
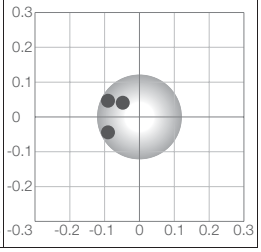
RD THINNING

Outstanding centring with special web thinning effect!



■ Hole Position Accuracy

Direct drilling

Cutting Speed	vc=180m/min	
Feed Rate	MDA series	Competitor's Product
f=0.6mm/rev		
f=1.2mm/rev		

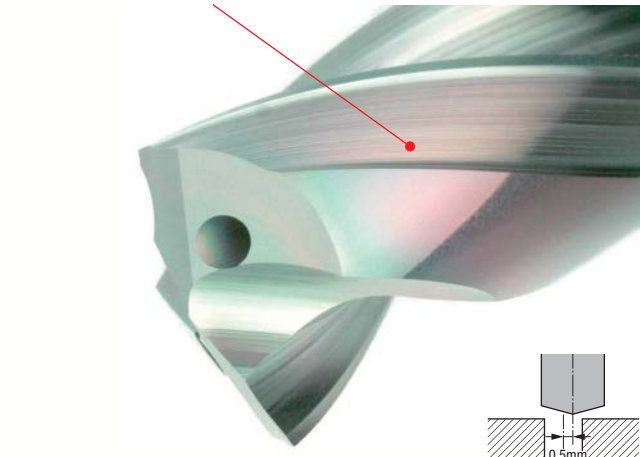
Unit (mm)

Work Material: ADC12 Tool: MDA0600S06H05 (ø6mm × 5D) Wet

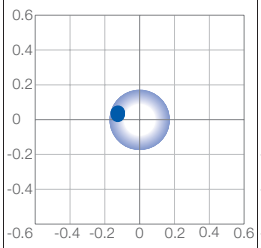
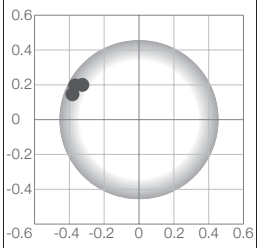
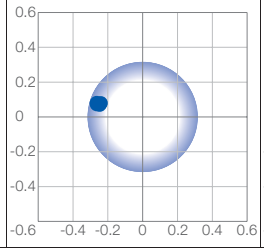
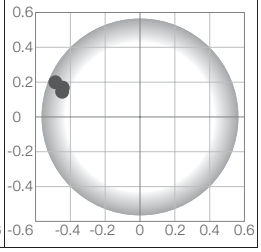
Hole position stable even under high-efficiency conditions

Wide Double Margin *Diameter: 3.1mm up

Hole precision is improved with wide double margin providing excellent guide performance!



Pre-cast drilling Pre-cast hole deviation: 0.5mm

Cutting Speed	vc=180m/min	
Feed Rate	MDA series	Competitor's Product
f=0.4mm/rev		
f=1.2mm/rev		

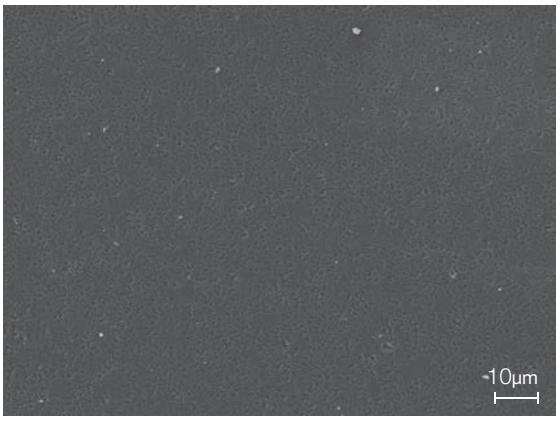
Unit (mm)

Work Material: ADC12 Tool: MDA0600S06H05 (ø6mm × 5D) Wet

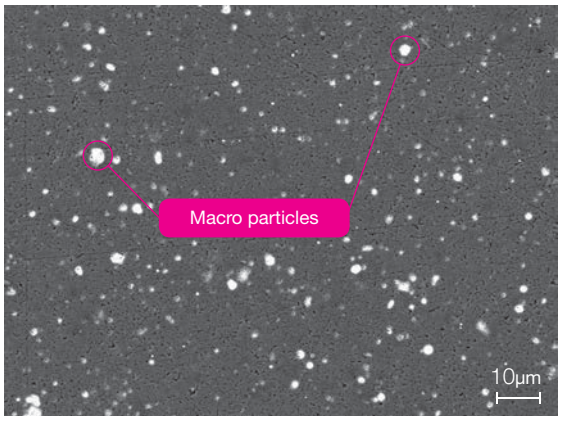
Significantly reduces the effects of pre-cast hole misalignment

AURORA Coat X DLC Coat

● Coating Surface Properties (SEM image)



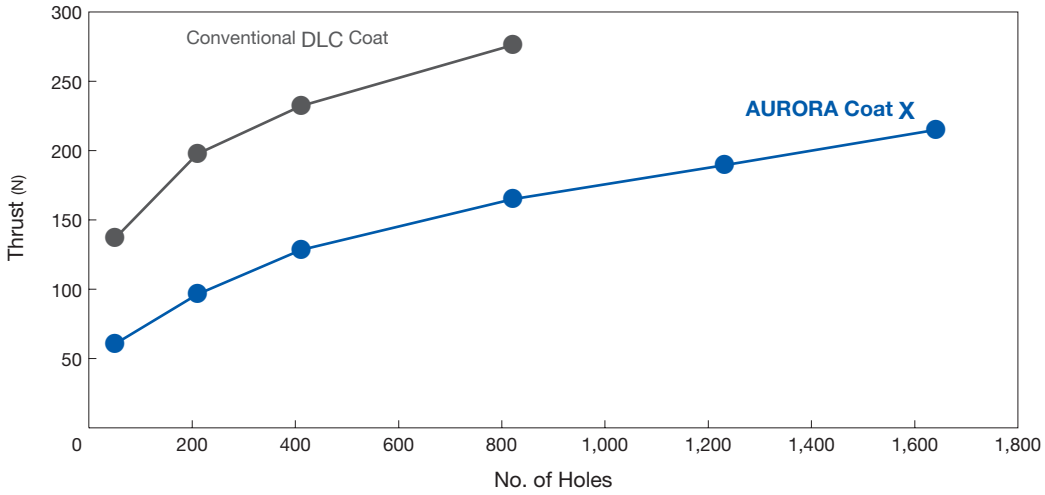
AURORA Coat X



Conventional DLC Coat

New technology significantly improves smoothness

● Cutting Force



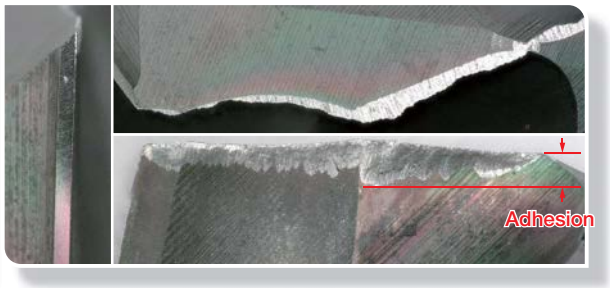
Work Material: ADC12 Machine: Vertical Machining Centre BT30
Tool: MDA0600S06H05 (ø6mm × 5D)
Cutting Conditions: vc = 180m/min f = 0.2mm/rev Internal Coolant Supply (Water-soluble)

Improved coating surface smoothness keeps resistance low at the initial stage, then transitions to a gradual rise in resistance for a longer tool life

● Adhesion Resistance

AURORA Coat X

Conventional DLC Coat



Work Material: ADC12 Machine: Vertical Machining Centre BT30
Tool: MDA0600S06H05 (ø6mm × 5D)
Cutting Conditions: vc = 180m/min f = 0.2mm/rev Internal Coolant Supply (Water-soluble)

Excellent smoothness significantly reduces adhesion

MDA series

Aluminum Alloy | Copper Alloy

New AURORA Coat DLC 3D 5D 10D 15D 20D

*Refer to N36 for the tolerance of h6

Fig 1 L/D = 3/5D single margin

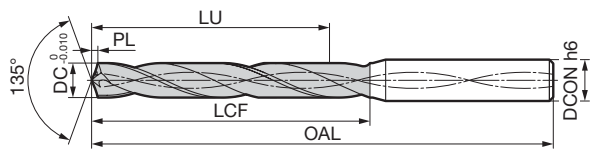
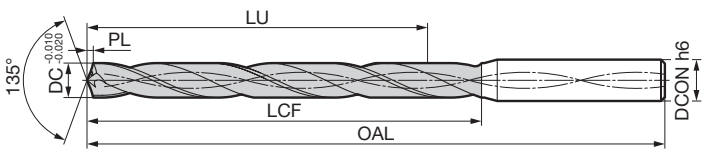


Fig 2 L/D = 10/15/20D single margin



Diameter ø1.0 to 2.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
1.0	3	●	MDA 0100S03H03	4.5	6.0	45.0	0.2	3.0	1
	5	●	0100S03H05	8.5	10.0	50.0	0.2	3.0	1
	10	●	0100S03H10	12.5	14.0	55.0	0.2	3.0	2
	15	●	0100S03H15	17.5	19.0	60.0	0.2	3.0	2
	20	●	0100S03H20	22.5	24.0	65.0	0.2	3.0	2
1.1	3	●	MDA 0110S03H03	6.4	8.0	45.0	0.2	3.0	1
	5	●	0110S03H05	10.4	12.0	50.0	0.2	3.0	1
	10	●	0110S03H10	16.4	18.0	55.0	0.2	3.0	2
	15	●	0110S03H15	19.4	21.0	65.0	0.2	3.0	2
	20	●	0110S03H20	24.4	26.0	70.0	0.2	3.0	2
1.2	3	●	MDA 0120S03H03	6.2	8.0	48.0	0.2	3.0	1
	5	●	0120S03H05	10.2	12.0	55.0	0.2	3.0	1
	10	●	0120S03H10	16.2	18.0	60.0	0.2	3.0	2
	15	●	0120S03H15	21.2	23.0	65.0	0.2	3.0	2
	20	●	0120S03H20	27.2	29.0	70.0	0.2	3.0	2
1.3	3	●	MDA 0130S03H03	6.1	8.0	48.0	0.3	3.0	1
	5	●	0130S03H05	12.1	14.0	55.0	0.3	3.0	1
	10	●	0130S03H10	18.1	20.0	60.0	0.3	3.0	2
	15	●	0130S03H15	23.1	25.0	65.0	0.3	3.0	2
	20	●	0130S03H20	29.1	31.0	75.0	0.3	3.0	2
1.4	3	●	MDA 0140S03H03	5.9	8.0	48.0	0.3	3.0	1
	5	●	0140S03H05	11.9	14.0	55.0	0.3	3.0	1
	10	●	0140S03H10	17.9	20.0	60.0	0.3	3.0	2
	15	●	0140S03H15	25.9	28.0	70.0	0.3	3.0	2
	20	●	0140S03H20	31.9	34.0	75.0	0.3	3.0	2
1.5	3	●	MDA 0150S03H03	5.8	8.0	48.0	0.3	3.0	1
	5	●	0150S03H05	13.8	16.0	55.0	0.3	3.0	1
	10	●	0150S03H10	20.8	23.0	65.0	0.3	3.0	2
	15	●	0150S03H15	25.8	28.0	70.0	0.3	3.0	2
	20	●	0150S03H20	33.8	36.0	75.0	0.3	3.0	2
1.6	3	●	MDA 0160S03H03	7.6	10.0	50.0	0.3	3.0	1
	5	●	0160S03H05	13.6	16.0	55.0	0.3	3.0	1
	10	●	0160S03H10	22.6	25.0	65.0	0.3	3.0	2
	15	●	0160S03H15	29.6	32.0	75.0	0.3	3.0	2
	20	●	0160S03H20	35.6	38.0	80.0	0.3	3.0	2
1.7	3	●	MDA 0170S03H03	7.5	10.0	50.0	0.4	3.0	1
	5	●	0170S03H05	15.5	18.0	60.0	0.4	3.0	1
	10	●	0170S03H10	22.5	25.0	65.0	0.4	3.0	2
	15	●	0170S03H15	29.5	32.0	75.0	0.4	3.0	2
	20	●	0170S03H20	38.5	41.0	80.0	0.4	3.0	2
1.8	3	●	MDA 0180S03H03	7.3	10.0	50.0	0.4	3.0	1
	5	●	0180S03H05	15.3	18.0	60.0	0.4	3.0	1
	10	●	0180S03H10	25.3	28.0	70.0	0.4	3.0	2
	15	●	0180S03H15	32.3	35.0	75.0	0.4	3.0	2
	20	●	0180S03H20	40.3	43.0	85.0	0.4	3.0	2
1.9	3	●	MDA 0190S03H03	7.2	10.0	50.0	0.4	3.0	1
	5	●	0190S03H05	17.2	20.0	60.0	0.4	3.0	1
	10	●	0190S03H10	25.2	28.0	70.0	0.4	3.0	2
	15	●	0190S03H15	32.2	35.0	75.0	0.4	3.0	2
	20	●	0190S03H20	43.2	46.0	85.0	0.4	3.0	2
2.0	3	●	MDA 0200S03H03	7.0	10.0	50.0	0.4	3.0	1
	5	●	0200S03H05	17.0	20.0	60.0	0.4	3.0	1
	10	●	0200S03H10	27.0	30.0	70.0	0.4	3.0	2
	15	●	0200S03H15	37.0	40.0	80.0	0.4	3.0	2
	20	●	0200S03H20	45.0	48.0	90.0	0.4	3.0	2

Grade: DLX1700

Diameter ø2.1 to 3.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.1	3	●	MDA 0210S03H03	9.9	13.0	55.0	0.4	3.0	1
	5	●	0210S03H05	18.9	22.0	65.0	0.4	3.0	1
	10	●	0210S03H10	26.9	30.0	70.0	0.4	3.0	2
	15	●	0210S03H15	36.9	40.0	80.0	0.4	3.0	2
	20	●	0210S03H20	46.9	50.0	95.0	0.4	3.0	2
2.2	3	●	MDA 0220S03H03	9.7	13.0	55.0	0.5	3.0	1
	5	●	0220S03H05	18.7	22.0	65.0	0.5	3.0	1
	10	●	0220S03H10	28.7	32.0	75.0	0.5	3.0	2
	15	●	0220S03H15	38.7	42.0	85.0	0.5	3.0	2
	20	●	0220S03H20	47.7	51.0	95.0	0.5	3.0	2
2.3	3	●	MDA 0230S03H03	9.6	13.0	55.0	0.5	3.0	1
	5	●	0230S03H05	20.6	24.0	65.0	0.5	3.0	1
	10	●	0230S03H10	28.6	32.0	75.0	0.5	3.0	2
	15	●	0230S03H15	41.6	45.0	85.0	0.5	3.0	2
	20	●	0230S03H20	49.6	53.0	100.0	0.5	3.0	2
2.4	3	●	MDA 0240S03H03	9.4	13.0	55.0	0.5	3.0	1
	5	●	0240S03H05	20.4	24.0	65.0	0.5	3.0	1
	10	●	0240S03H10	31.4	35.0	75.0	0.5	3.0	2
	15	●	0240S03H15	41.4	45.0	85.0	0.5	3.0	2
	20	●	0240S03H20	52.4	56.0	100.0	0.5	3.0	2
2.5	3	●	MDA 0250S03H03	9.3	13.0	55.0	0.5	3.0	1
	5	●	0250S03H05	22.3	26.0	65.0	0.5	3.0	1
	10	●	0250S03H10	31.3	35.0	75.0	0.5	3.0	2
	15	●	0250S03H15	41.3	45.0	85.0	0.5	3.0	2
	20	●	0250S03H20	56.3	60.0	105.0	0.5	3.0	2
2.6	3	●	MDA 0260S03H03	11.1	15.0	60.0	0.5	3.0	1
	5	●	0260S03H05	22.1	26.0	70.0	0.5	3.0	1
	10	●	0260S03H10	34.1	38.0	80.0	0.5	3.0	2
	15	●	0260S03H15	46.1	50.0	90.0	0.5	3.0	2
	20	●	0260S03H20	57.1	61.0	105.0	0.5	3.0	2
2.7	3	●	MDA 0270S03H03	11.0	15.0	60.0	0.6	3.0	1
	5	●	0270S03H05	24.0	28.0	70.0	0.6	3.0	1
	10	●	0270S03H10	34.0	38.0	80.0	0.6	3.0	2
	15	●	0270S03H15	46.0	50.0	90.0	0.6	3.0	2
	20	●	0270S03H20	59.0	63.0	105.0	0.6	3.0	2
2.8	3	●	MDA 0280S03H03	10.8	15.0	60.0	0.6	3.0	1
	5	●	0280S03H05	23.8	28.0	70.0	0.6	3.0	1
	10	●	0280S03H10	35.8	40.0	80.0	0.6	3.0	2
	15	●	0280S03H15	50.8	55.0	95.0	0.6	3.0	2
	20	●	0280S03H20	60.8	65.0	110.0	0.6	3.0	2
2.9	3	●	MDA 0290S03H03	10.7	15.0	60.0	0.6	3.0	1
	5	●	0290S03H05	25.7	30.0	70.0	0.6	3.0	1
	10	●	0290S03H10	35.7	40.0	80.0	0.6	3.0	2
	15	●	0290S03H15	50.7	55.0	95.0	0.6	3.0	2
	20	●	0290S03H20	62.7	67.0	110.0	0.6	3.0	2
3.0	3	●	MDA 0300S03H03	10.5	15.0	60.0	0.6	3.0	1
	5	●	0300S03H05	25.5	30.0	70.0	0.6	3.0	1
	10	●	0300S03H10	37.5	42.0	82.0	0.6	3.0	2
	15	●	0300S03H15	53.5	58.0	98.0	0.6	3.0	2
	20	●	0300S03H20	64.5	69.0	110.0	0.6	3.0	2

Grade: DLX1700

● mark: Standard stocked item (new product/expanded item)

MDA series

Aluminum Alloy | Copper Alloy

New | AURORA Coat DLC | 3D | 5D | 10D

*Refer to N36 for the tolerance of h6

Fig 1 L/D = 3/5D double margin

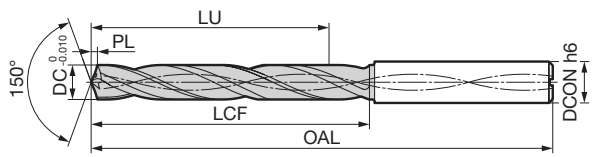
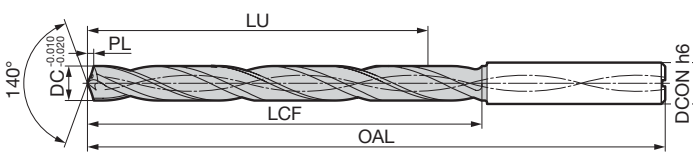


Fig 2 L/D = 10D double margin



Diameter ø3.1 to 4.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.1	3	●	MDA 0310S04H03	15.8	20.4	72.4	0.4	4.0	1
	5	●	0310S04H05	27.8	32.4	86.4	0.4	4.0	1
	10	●	0310S04H10	44.9	49.6	106.6	0.6	4.0	2
3.2	3	●	MDA 0320S04H03	15.6	20.4	72.4	0.4	4.0	1
	5	●	0320S04H05	27.6	32.4	86.4	0.4	4.0	1
	10	●	0320S04H10	44.8	49.6	106.6	0.6	4.0	2
3.3	3	●	MDA 0330S04H03	15.5	20.4	72.4	0.4	4.0	1
	5	●	0330S04H05	27.5	32.4	86.4	0.4	4.0	1
	10		0330S04H10	44.7	49.6	106.6	0.6	4.0	2
3.4	3		MDA 0340S04H03	15.4	20.5	72.5	0.5	4.0	1
	5	●	0340S04H05	27.4	32.5	86.5	0.5	4.0	1
	10	●	0340S04H10	44.5	49.6	106.6	0.6	4.0	2
3.5	3	●	MDA 0350S04H03	15.2	20.5	72.5	0.5	4.0	1
	5	●	0350S04H05	27.2	32.5	86.5	0.5	4.0	1
	10	●	0350S04H10	44.4	49.6	106.6	0.6	4.0	2
3.6	3		MDA 0360S04H03	17.6	23.0	72.5	0.5	4.0	1
	5	●	0360S04H05	31.1	36.5	86.5	0.5	4.0	1
	10	●	0360S04H10	51.3	56.7	106.7	0.7	4.0	2
3.65	3	●	MDA 0365S04H03	17.4	23.0	72.5	0.5	4.0	1
	5	●	0365S04H05	30.9	36.5	86.5	0.5	4.0	1
3.66	5	●	MDA 0366S04H05	30.9	36.5	86.5	0.5	4.0	1
3.7	3		MDA 0370S04H03	17.4	23.0	72.5	0.5	4.0	1
	5	●	0370S04H05	30.9	36.5	86.5	0.5	4.0	1
	10		0370S04H10	51.1	56.7	106.7	0.7	4.0	2
3.8	3		MDA 0380S04H03	17.3	23.0	72.5	0.5	4.0	1
	5	●	0380S04H05	30.8	36.5	86.5	0.5	4.0	1
	10		0380S04H10	51.0	56.7	106.7	0.7	4.0	2
3.9	3		MDA 0390S04H03	17.2	23.0	72.5	0.5	4.0	1
	5	●	0390S04H05	30.7	36.5	86.5	0.5	4.0	1
	10		0390S04H10	50.9	56.7	106.7	0.7	4.0	2
4.0	3	●	MDA 0400S04H03	17.0	23.0	72.5	0.5	4.0	1
	5	●	0400S04H05	30.5	36.5	86.5	0.5	4.0	1
	10	●	0400S04H10	50.7	56.7	106.7	0.7	4.0	2
4.1	3	●	MDA 0410S06H03	19.4	25.5	80.5	0.5	6.0	1
	5	●	0410S06H05	34.4	40.5	98.5	0.5	6.0	1
	10		0410S06H10	57.6	63.7	121.7	0.7	6.0	2
4.2	3	●	MDA 0420S06H03	19.3	25.6	80.6	0.6	6.0	1
	5	●	0420S06H05	34.3	40.6	98.6	0.6	6.0	1
	10		0420S06H10	57.5	63.8	121.8	0.8	6.0	2
4.3	3		MDA 0430S06H03	19.1	25.6	80.6	0.6	6.0	1
	5	●	0430S06H05	34.1	40.6	98.6	0.6	6.0	1
	10		0430S06H10	57.3	63.8	121.8	0.8	6.0	2
4.4	3		MDA 0440S06H03	19.0	25.6	80.6	0.6	6.0	1
	5	●	0440S06H05	34.0	40.6	98.6	0.6	6.0	1
	10		0440S06H10	57.2	63.8	121.8	0.8	6.0	2
4.5	3	●	MDA 0450S06H03	18.9	25.6	80.6	0.6	6.0	1
	5	●	0450S06H05	33.9	40.6	98.6	0.6	6.0	1
	10	●	0450S06H10	57.1	63.8	121.8	0.8	6.0	2

Grade: DLX1700

Diameter ø4.6 to 6.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.6	3	●	MDA 0460S06H03	20.7	27.6	80.6	0.6	6.0	1
	5	●	0460S06H05	37.7	44.6	98.6	0.6	6.0	1
	10		0460S06H10	61.9	68.8	121.8	0.8	6.0	2
4.7	3		MDA 0470S06H03	20.6	27.6	80.6	0.6	6.0	1
	5	●	0470S06H05	37.6	44.6	98.6	0.6	6.0	1
	10		0470S06H10	61.8	68.9	121.9	0.9	6.0	2
4.8	3		MDA 0480S06H03	20.4	27.6	80.6	0.6	6.0	1
	5	●	0480S06H05	37.4	44.6	98.6	0.6	6.0	1
	10	●	0480S06H10	61.7	68.9	121.9	0.9	6.0	2
4.9	3		MDA 0490S06H03	20.5	27.7	80.7	0.7	6.0	1
	5	●	0490S06H05	37.5	44.7	98.7	0.7	6.0	1
	10	●	0490S06H10	61.7	68.9	121.9	0.9	6.0	2
5.0	3	●	MDA 0500S06H03	20.2	27.7	80.7	0.7	6.0	1
	5	●	0500S06H05	37.2	44.7	98.7	0.7	6.0	1
	10	●	0500S06H10	61.4	68.9	121.9	0.9	6.0	2
5.1	3		MDA 0510S06H03	20.5	28.2	82.7	0.7	6.0	1
	5	●	0510S06H05	37.0	44.7	100.7	0.7	6.0	1
	10	●	0510S06H10	70.3	77.9	136.9	0.9	6.0	2
5.2	3	●	MDA 0520S06H03	20.4	28.2	82.7	0.7	6.0	1
	5	●	0520S06H05	36.9	44.7	100.7	0.7	6.0	1
	10		0520S06H10	70.1	77.9	136.9	0.9	6.0	2
5.3	3	●	MDA 0530S06H03	20.3	28.2	82.7	0.7	6.0	1
	5	●	0530S06H05	36.8	44.7	100.7	0.7	6.0	1
	10		0530S06H10	70.0	78.0	137.0	1.0	6.0	2
5.4	3		MDA 0540S06H03	20.1	28.2	82.7	0.7	6.0	1
	5	●	0540S06H05	36.6	44.7	100.7	0.7	6.0	1
	10		0540S06H10	69.9	78.0	137.0	1.0	6.0	2
5.5	3	●	MDA 0550S06H03	20.0	28.2	82.7	0.7	6.0	1
	5	●	0550S06H05	36.5	44.7	100.7	0.7	6.0	1
	10	●	0550S06H10	69.8	78.0	137.0	1.0	6.0	2
5.6	3		MDA 0560S06H03	22.3	30.7	82.7	0.8	6.0	1
	5	●	0560S06H05	40.3	48.7	100.7	0.8	6.0	1
	10	●	0560S06H10	76.6	85.0	137.0	1.0	6.0	2
5.7	3		MDA 0570S06H03	22.2	30.8	82.8	0.8	6.0	1
	5	●	0570S06H05	40.2	48.8	100.8	0.8	6.0	1
	10		0570S06H10	76.5	85.0	137.0	1.0	6.0	2
5.8	3		MDA 0580S06H03	22.1	30.8	82.8	0.8	6.0	1
	5	●	0580S06H05	40.1	48.8	100.8	0.8	6.0	1
	10	●	0580S06H10	76.4	85.1	137.1	1.1	6.0	2
5.9	3	●	MDA 0590S06H03	21.9	30.8	82.8	0.8	6.0	1
	5	●	0590S06H05	39.9	48.8	100.8	0.8	6.0	1
	10	●	0590S06H10	76.2	85.1	137.1	1.1	6.0	2
6.0	3	●	MDA 0600S06H03	21.8	30.8	82.8	0.8	6.0	1
	5	●	0600S06H05	39.8	48.8	100.8	0.8	6.0	1
	10	●	0600S06H10	76.1	85.1	137.1	1.1	6.0	2

Grade: DLX1700

MDA series

Aluminum Alloy | Copper Alloy

New | AURORA Coat DLC | 3D | 5D | 10D

*Refer to N36 for the tolerance of h6

Fig 1 L/D = 3/5D double margin

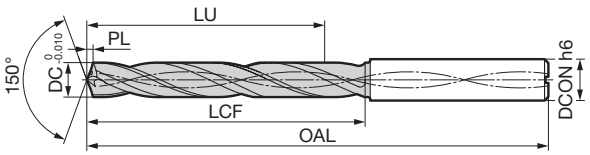
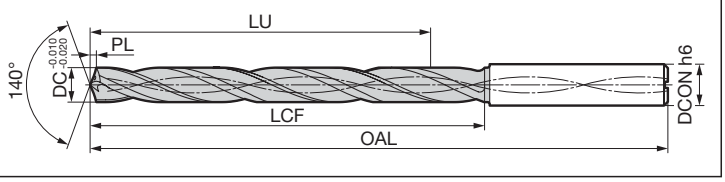


Fig 2 L/D = 10D double margin



Diameter ø6.1 to 7.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.1	3		MDA 0610S08H03	24.2	33.3	88.8	0.8	8.0	1
	5	●	0610S08H05	43.7	52.8	109.8	0.8	8.0	1
	10	●	0610S08H10	83.0	92.1	152.1	1.1	8.0	2
6.2	3		MDA 0620S08H03	24.0	33.3	88.8	0.8	8.0	1
	5	●	0620S08H05	43.5	52.8	109.8	0.8	8.0	1
	10		0620S08H10	82.8	92.1	152.1	1.1	8.0	2
6.3	3		MDA 0630S08H03	23.9	33.3	88.8	0.8	8.0	1
	5	●	0630S08H05	43.4	52.8	109.8	0.8	8.0	1
	10		0630S08H10	82.7	92.1	152.1	1.1	8.0	2
6.4	3		MDA 0640S08H03	23.8	33.4	88.9	0.9	8.0	1
	5	●	0640S08H05	43.3	52.9	109.9	0.9	8.0	1
	10		0640S08H10	82.6	92.2	152.2	1.2	8.0	2
6.5	3	●	MDA 0650S08H03	23.6	33.4	88.9	0.9	8.0	1
	5	●	0650S08H05	43.1	52.9	109.9	0.9	8.0	1
	10	●	0650S08H10	82.4	92.2	152.2	1.2	8.0	2
6.6	3		MDA 0660S08H03	24.0	33.9	88.9	0.9	8.0	1
	5	●	0660S08H05	45.0	54.9	109.9	0.9	8.0	1
	10		0660S08H10	87.3	97.2	152.2	1.2	8.0	2
6.7	3	●	MDA 0670S08H03	24.0	33.9	88.9	0.9	8.0	1
	5	●	0670S08H05	45.0	54.9	109.9	0.9	8.0	1
	10		0670S08H10	87.3	97.2	152.2	1.2	8.0	2
6.8	3	●	MDA 0680S08H03	23.7	33.9	88.9	0.9	8.0	1
	5	●	0680S08H05	44.7	54.9	109.9	0.9	8.0	1
	10	●	0680S08H10	87.0	97.2	152.2	1.2	8.0	2
6.9	3		MDA 0690S08H03	23.6	33.9	88.9	0.9	8.0	1
	5		0690S08H05	44.6	54.9	109.9	0.9	8.0	1
	10		0690S08H10	86.9	97.3	152.3	1.3	8.0	2
7.0	3	●	MDA 0700S08H03	23.4	33.9	88.9	0.9	8.0	1
	5	●	0700S08H05	44.4	54.9	109.9	0.9	8.0	1
	10	●	0700S08H10	86.8	97.3	152.3	1.3	8.0	2
7.1	3		MDA 0710S08H03	27.8	38.4	94.9	1.0	8.0	1
	5	●	0710S08H05	50.3	60.9	118.9	1.0	8.0	1
	10		0710S08H10	95.6	106.3	167.3	1.3	8.0	2
7.2	3		MDA 0720S08H03	27.7	38.5	95.0	1.0	8.0	1
	5	●	0720S08H05	50.2	61.0	119.0	1.0	8.0	1
	10		0720S08H10	95.5	106.3	167.3	1.3	8.0	2
7.3	3		MDA 0730S08H03	27.5	38.5	95.0	1.0	8.0	1
	5	●	0730S08H05	50.0	61.0	119.0	1.0	8.0	1
	10		0730S08H10	95.4	106.3	167.3	1.3	8.0	2
7.35	3	●	MDA 0735S08H03	27.4	38.5	95.0	1.0	8.0	1
	5	●	0735S08H05	49.9	61.0	119.0	1.0	8.0	1
7.4	3	●	MDA 0740S08H03	27.4	38.5	95.0	1.0	8.0	1
	5	●	0740S08H05	49.9	61.0	119.0	1.0	8.0	1
	10		0740S08H10	95.2	106.3	167.3	1.3	8.0	2
7.5	3	●	MDA 0750S08H03	27.3	38.5	95.0	1.0	8.0	1
	5	●	0750S08H05	49.8	61.0	119.0	1.0	8.0	1
	10	●	0750S08H10	95.1	106.4	167.4	1.4	8.0	2

Grade: DLX1700

Diameter ø7.6 to 9.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
7.6	3		MDA 0760S08H03	29.6	41.0	95.0	1.0	8.0	1
	5	●	0760S08H05	53.6	65.0	119.0	1.0	8.0	1
	10		0760S08H10	102.0	113.4	167.4	1.4	8.0	2
7.7	3		MDA 0770S08H03	29.5	41.0	95.0	1.0	8.0	1
	5	●	0770S08H05	53.5	65.0	119.0	1.0	8.0	1
	10		0770S08H10	101.9	113.4	167.4	1.4	8.0	2
7.8	3	●	MDA 0780S08H03	29.3	41.0	95.0	1.0	8.0	1
	5	●	0780S08H05	53.3	65.0	119.0	1.0	8.0	1
	10	●	0780S08H10	101.7	113.4	167.4	1.4	8.0	2
7.9	3		MDA 0790S08H03	29.2	41.1	95.1	1.1	8.0	1
	5	●	0790S08H05	53.2	65.1	119.1	1.1	8.0	1
	10		0790S08H10	101.6	113.4	167.4	1.4	8.0	2
8.0	3	●	MDA 0800S08H03	29.1	41.1	95.1	1.1	8.0	1
	5	●	0800S08H05	53.1	65.1	119.1	1.1	8.0	1
	10	●	0800S08H10	101.5	113.5	167.5	1.5	8.0	2
8.1	3		MDA 0810S10H03	31.4	43.6	101.1	1.1	10.0	1
	5	●	0810S10H05	56.9	69.1	128.1	1.1	10.0	1
	10	●	0810S10H10	108.3	120.5	182.5	1.5	10.0	2
8.2	3		MDA 0820S10H03	31.3	43.6	101.1	1.1	10.0	1
	5	●	0820S10H05	56.8	69.1	128.1	1.1	10.0	1
	10	●	0820S10H10	108.2	120.5	182.5	1.5	10.0	2
8.3	3		MDA 0830S10H03	31.2	43.6	101.1	1.1	10.0	1
	5	●	0830S10H05	56.7	69.1	128.1	1.1	10.0	1
	10		0830S10H10	108.1	120.5	182.5	1.5	10.0	2
8.4	3		MDA 0840S10H03	31.0	43.6	101.1	1.1	10.0	1
	5	●	0840S10H05	56.5	69.1	128.1	1.1	10.0	1
	10		0840S10H10	107.9	120.5	182.5	1.5	10.0	2
8.5	3	●	MDA 0850S10H03	31.0	43.6	101.1	1.1	10.0	1
	5	●	0850S10H05	56.5	69.1	128.1	1.1	10.0	1
	10	●	0850S10H10	107.9	120.5	182.5	1.5	10.0	2
8.6	3	●	MDA 0860S10H03	31.2	44.1	101.1	1.2	10.0	1
	5	●	0860S10H05	58.2	71.1	128.1	1.2	10.0	1
	10		0860S10H10	112.7	125.6	182.6	1.6	10.0	2
8.7	3		MDA 0870S10H03	31.1	44.2	101.2	1.2	10.0	1
	5	●	0870S10H05	58.1	71.2	128.2	1.2	10.0	1
	10		0870S10H10	112.5	125.6	182.6	1.6	10.0	2
8.8	3	●	MDA 0880S10H03	31.0	44.2	101.2	1.2	10.0	1
	5	●	0880S10H05	58.0	71.2	128.2	1.2	10.0	1
	10		0880S10H10	112.4	125.6	182.6	1.6	10.0	2
8.9	3		MDA 0890S10H03	30.8	44.2	101.2	1.2	10.0	1
	5	●	0890S10H05	57.8	71.2	128.2	1.2	10.0	1
	10		0890S10H10	112.3	125.6	182.6	1.6	10.0	2
9.0	3	●	MDA 0900S10H03	30.7	44.2	101.2	1.2	10.0	1
	5	●	0900S10H05	57.7	71.2	128.2	1.2	10.0	1
	10	●	0900S10H10	112.1	125.6	182.6	1.6	10.0	2

Grade: DLX1700

● mark: Standard stocked item (new product/expanded item)

MDA series

Aluminum Alloy | Copper Alloy

New | AURORA Coat DLC | 3D | 5D | 10D

*Refer to N36 for the tolerance of h6

Fig 1 L/D = 3/5D double margin

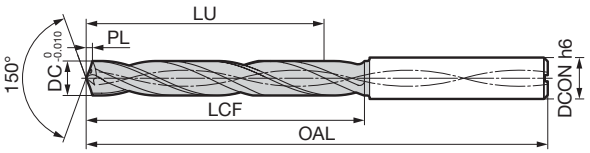
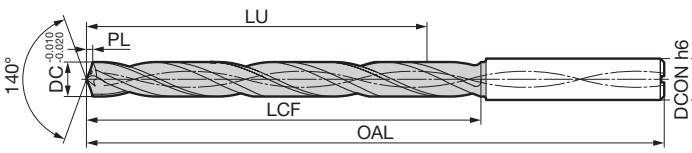


Fig 2 L/D = 10D double margin



Diameter ø9.1 to 10.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
9.1	3		MDA 0910S10H03	35.1	48.7	107.2	1.2	10.0	1
	5	●	0910S10H05	63.6	77.2	137.2	1.2	10.0	1
	10		0910S10H10	121.0	134.7	197.7	1.7	10.0	2
9.2	3		MDA 0920S10H03	34.9	48.7	107.2	1.2	10.0	1
	5	●	0920S10H05	63.4	77.2	137.2	1.2	10.0	1
	10		0920S10H10	120.9	134.7	197.7	1.7	10.0	2
9.21	5	●	MDA 0921S10H05	63.3	77.2	137.2	1.2	10.0	1
9.3	3		MDA 0930S10H03	34.8	48.7	107.2	1.2	10.0	1
	5	●	0930S10H05	63.3	77.2	137.2	1.2	10.0	1
	10	●	0930S10H10	120.7	134.7	197.7	1.7	10.0	2
9.4	3	●	MDA 0940S10H03	34.7	48.8	107.3	1.3	10.0	1
	5	●	0940S10H05	63.2	77.3	137.3	1.3	10.0	1
	10		0940S10H10	120.6	134.7	197.7	1.7	10.0	2
9.5	3	●	MDA 0950S10H03	34.5	48.8	107.3	1.3	10.0	1
	5	●	0950S10H05	63.0	77.3	137.3	1.3	10.0	1
	10	●	0950S10H10	120.5	134.7	197.7	1.7	10.0	2
9.6	3	●	MDA 0960S10H03	36.9	51.3	107.3	1.3	10.0	1
	5	●	0960S10H05	66.9	81.3	137.3	1.3	10.0	1
	10		0960S10H10	127.3	141.7	197.7	1.7	10.0	2
9.7	3		MDA 0970S10H03	36.7	51.3	107.3	1.3	10.0	1
	5		0970S10H05	66.7	81.3	137.3	1.3	10.0	1
	10		0970S10H10	127.2	141.8	197.8	1.8	10.0	2
9.8	3		MDA 0980S10H03	36.6	51.3	107.3	1.3	10.0	1
	5	●	0980S10H05	66.6	81.3	137.3	1.3	10.0	1
	10	●	0980S10H10	127.1	141.8	197.8	1.8	10.0	2
9.9	3		MDA 0990S10H03	36.5	51.3	107.3	1.3	10.0	1
	5		0990S10H05	66.5	81.3	137.3	1.3	10.0	1
	10		0990S10H10	127.0	141.8	197.8	1.8	10.0	2
10.0	3	●	MDA 1000S10H03	36.3	51.3	107.3	1.3	10.0	1
	5	●	1000S10H05	66.3	81.3	137.3	1.3	10.0	1
	10	●	1000S10H10	126.8	141.8	197.8	1.8	10.0	2
10.1	3	●	MDA 1010S12H03	38.7	53.8	117.3	1.4	12.0	1
	5	●	1010S12H05	70.2	85.3	150.3	1.4	12.0	1
	10		1010S12H10	133.7	148.8	216.8	1.8	12.0	2
10.2	3		MDA 1020S12H03	38.6	53.9	117.4	1.4	12.0	1
	5		1020S12H05	70.1	85.4	150.4	1.4	12.0	1
	10		1020S12H10	133.6	148.9	216.9	1.9	12.0	2
10.3	3	●	MDA 1030S12H03	38.6	53.9	117.4	1.4	12.0	1
	5	●	1030S12H05	70.1	85.4	150.4	1.4	12.0	1
	10		1030S12H10	133.6	148.9	216.9	1.9	12.0	2
10.4	3	●	MDA 1040S12H03	38.3	53.9	117.4	1.4	12.0	1
	5	●	1040S12H05	69.8	85.4	150.4	1.4	12.0	1
	10		1040S12H10	133.3	148.9	216.9	1.9	12.0	2
10.5	3	●	MDA 1050S12H03	38.2	53.9	117.4	1.4	12.0	1
	5	●	1050S12H05	69.7	85.4	150.4	1.4	12.0	1
	10	●	1050S12H10	133.2	148.9	216.9	1.9	12.0	2

Grade: DLX1700

Diameter ø10.6 to 12.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
10.6	3	●	MDA 1060S12H03	38.5	54.4	117.4	1.4	12.0	1
	5	●	1060S12H05	71.5	87.4	150.4	1.4	12.0	1
	10		1060S12H10	138.0	153.9	216.9	1.9	12.0	2
10.7	3		MDA 1070S12H03	38.4	54.4	117.4	1.4	12.0	1
	5		1070S12H05	71.4	87.4	150.4	1.4	12.0	1
	10		1070S12H10	137.9	153.9	216.9	1.9	12.0	2
10.8	3		MDA 1080S12H03	38.2	54.4	117.4	1.4	12.0	1
	5	●	1080S12H05	71.2	87.4	150.4	1.4	12.0	1
	10	●	1080S12H10	137.8	154.0	217.0	2.0	12.0	2
10.9	3		MDA 1090S12H03	38.1	54.5	117.5	1.5	12.0	1
	5		1090S12H05	71.1	87.5	150.5	1.5	12.0	1
	10		1090S12H10	137.6	154.0	217.0	2.0	12.0	2
11.0	3	●	MDA 1100S12H03	38.0	54.5	117.5	1.5	12.0	1
	5	●	1100S12H05	71.0	87.5	150.5	1.5	12.0	1
	10	●	1100S12H10	137.5	154.0	217.0	2.0	12.0	2
11.1	3	●	MDA 1110S12H03	42.3	59.0	123.5	1.5	12.0	1
	5	●	1110S12H05	76.8	93.5	159.5	1.5	12.0	1
	10		1110S12H10	146.4	163.0	232.0	2.0	12.0	2
11.2	3		MDA 1120S12H03	42.2	59.0	123.5	1.5	12.0	1
	5	●	1120S12H05	76.7	93.5	159.5	1.5	12.0	1
	10		1120S12H10	146.2	163.0	232.0	2.0	12.0	2
11.3	3		MDA 1130S12H03	42.1	59.0	123.5	1.5	12.0	1
	5		1130S12H05	76.6	93.5	159.5	1.5	12.0	1
	10		1130S12H10	146.1	163.1	232.1	2.1	12.0	2
11.4	3		MDA 1140S12H03	41.9	59.0	123.5	1.5	12.0	1
	5	●	1140S12H05	76.4	93.5	159.5	1.5	12.0	1
	10		1140S12H10	146.0	163.1	232.1	2.1	12.0	2
11.5	3	●	MDA 1150S12H03	41.8	59.0	123.5	1.5	12.0	1
	5	●	1150S12H05	76.3	93.5	159.5	1.5	12.0	1
	10	●	1150S12H10	145.8	163.1	232.1	2.1	12.0	2
11.6	3		MDA 1160S12H03	44.1	61.5	123.5	1.6	12.0	1
	5		1160S12H05	80.1	97.5	159.5	1.6	12.0	1
	10		1160S12H10	152.7	170.1	232.1	2.1	12.0	2
11.7	3		MDA 1170S12H03	44.0	61.6	123.6	1.6	12.0	1
	5		1170S12H05	80.0	97.6	159.6	1.6	12.0	1
	10		1170S12H10	152.6	170.1	232.1	2.1	12.0	2
11.8	3		MDA 1180S12H03	43.9	61.6	123.6	1.6	12.0	1
	5	●	1180S12H05	79.9	97.6	159.6	1.6	12.0	1
	10		1180S12H10	152.4	170.1	232.1	2.1	12.0	2
11.9	3		MDA 1190S12H03	43.7	61.6	123.6	1.6	12.0	1
	5		1190S12H05	79.7	97.6	159.6	1.6	12.0	1
	10		1190S12H10	152.3	170.2	232.2	2.2	12.0	2
12.0	3	●	MDA 1200S12H03	43.6	61.6	123.6	1.6	12.0	1
	5	●	1200S12H05	79.6	97.6	159.6	1.6	12.0	1
	10	●	1200S12H10	152.2	170.2	232.2	2.2	12.0	2

Grade: DLX1700

Recommended Cutting Conditions (L/D = 3D, 5D)

Work Material	Aluminum alloy casting/Aluminum alloy die cast material ADC, AC		Duralumin-based aluminum alloy Al-Zn-Mg type (7075)		Wrought aluminum alloy Al-Mg type (5052)	
Dia. (mm)	Cutting Speed (m/min)	Feed Rate (mm/rev)	Cutting Speed (m/min)	Feed Rate (mm/rev)	Cutting Speed (m/min)	Feed Rate (mm/rev)
up to ø2.00	50 - 120	0.05 - 0.40	40 - 90	0.05 - 0.20	50 - 120	0.04 - 0.08
up to ø3.00	60 - 150	0.10 - 0.60	50 - 100	0.10 - 0.30	60 - 150	0.04 - 0.08
up to ø4.00	60 - 150	0.15 - 0.80	50 - 120	0.15 - 0.40	60 - 150	0.05 - 0.12
up to ø6.00	80 - 200	0.20 - 1.20	80 - 180	0.20 - 0.60	80 - 200	0.08 - 0.18
up to ø8.00	100 - 200	0.20 - 1.20	80 - 180	0.20 - 0.80	100 - 200	0.10 - 0.20
up to ø10.00	100 - 200	0.20 - 1.20	100 - 180	0.20 - 0.80	100 - 200	0.10 - 0.25
up to ø12.00	120 - 250	0.20 - 1.20	120 - 200	0.20 - 0.80	120 - 250	0.10 - 0.30

· The recommended cutting conditions above are for cases where a water-soluble coolant is used.
· Use with internal coolant supply.
· Recommended coolant supply pressure of 2.0MPa or higher for ø3 or below, and 1.5MPa or higher for over ø3.
· Keep the drill runout at 0.02mm or lower.
· If abnormalities such as noise or vibration occur, change the cutting conditions accordingly.
· When drilling with pre-cast holes, we recommend the lower-limit end of the recommended conditions.

Recommended Cutting Conditions (L/D = 10D or longer)

Work Material	Aluminum alloy casting/Aluminum alloy die cast material ADC, AC		Duralumin-based aluminum alloy Al-Zn-Mg type (7075)		Wrought aluminum alloy Al-Mg type (5052)	
Dia. (mm)	Cutting Speed (m/min)	Feed Rate (mm/rev)	Cutting Speed (m/min)	Feed Rate (mm/rev)	Cutting Speed (m/min)	Feed Rate (mm/rev)
up to ø2.00	50 - 100	0.05 - 0.20	40 - 60	0.05 - 0.15	50 - 100	0.04 - 0.08
up to ø3.00	60 - 120	0.10 - 0.30	50 - 80	0.10 - 0.20	60 - 120	0.04 - 0.08
up to ø4.00	60 - 120	0.15 - 0.40	50 - 100	0.10 - 0.25	60 - 120	0.04 - 0.10
up to ø6.00	80 - 150	0.20 - 0.60	60 - 120	0.15 - 0.30	80 - 150	0.06 - 0.12
up to ø8.00	80 - 180	0.20 - 0.60	80 - 150	0.20 - 0.40	80 - 180	0.08 - 0.15
up to ø10.00	100 - 180	0.20 - 0.60	100 - 150	0.20 - 0.40	100 - 180	0.10 - 0.20
up to ø12.00	120 - 200	0.20 - 0.60	120 - 180	0.20 - 0.40	120 - 200	0.10 - 0.25

· The recommended cutting conditions above are for cases where a water-soluble coolant is used.
· Use with internal coolant supply.
· Recommended coolant supply pressure of 2.0MPa or higher for ø3 or below, and 1.5MPa or higher for over ø3.
· Keep the drill runout at 0.02mm or lower.
· If abnormalities such as noise or vibration occur, change the cutting conditions accordingly.
· For drilling with pre-cast holes, drills of 10D (or longer) are not recommended.
· Drilling holes 10D or longer may lead to abnormalities; drill a guide hole (hole depth 1D to 2D) in advance.
· A 3D (5D) drill can be used for guide hole drilling. (For guide hole drilling, use conditions lower than the "Recommended feed for 10D or longer")

MEMO

Features

- **High-efficiency drilling**
  AURORA Coat (DLC Coat) and low resistance WL (Wide L) THINNING drastically reduce cutting force.
- **Stable drilling performance**
  Special cutting edge design and WW (Wide W) margin improve hole quality.
- **Long tool life**
  With AURORA Coat coupled with the cutting edge shape, a long and stable tool life is achieved.
- **Deep hole drilling**
  Drills for deep hole drilling can be made to order.
  (Production range: Diameters: ø3.0 to ø16.0mm
  Overall length: Available on inquiry)

Product Range (Stocked Sizes)

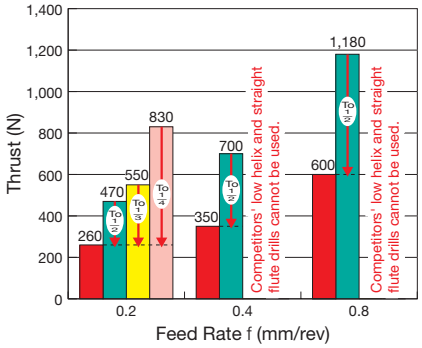
Coolant Supply	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)
Internal	MDW□□□□NHGS3	ø3.0 to 16.0	up to 3
	MDW□□□□NHGS5		up to 5
	MDW□□□□NHGS10	ø3.0 to 13.0	up to 10

Performance

Cutting Force

- **Low cutting force, achieving 2 to 4 times the feed rate**
  The cutting force of the NHGS series is 1/2 that of competitors' 30° helix drills ⇨ double the feed rate!
  1/3 that of competitors' low helix drills ⇨ 3x the feed rate!
  1/4 that of straight flute drills ⇨ 4x the feed rate!

Thrust

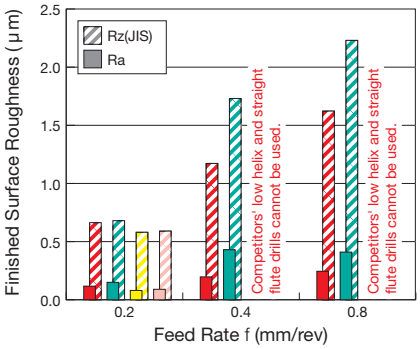


Tool: MDW 0800NHGS5 (DL1300)	Work Material: ADC12
Cutting Speed: vc = 200m/min	Machine: Vertical machining centre (BT30)
Coolant: Internal supply (1.5MPa)	Coolant: Emulsion (dilute to around 25x)

Drilled hole surface quality

- **Achieves good surface roughness over a wide range of feed rates**
  Good surface roughness from low to high feed rates:
  Ra=0.11 to 0.25
  Rz (JIS)=0.66 to 1.62

Finished Surface Roughness



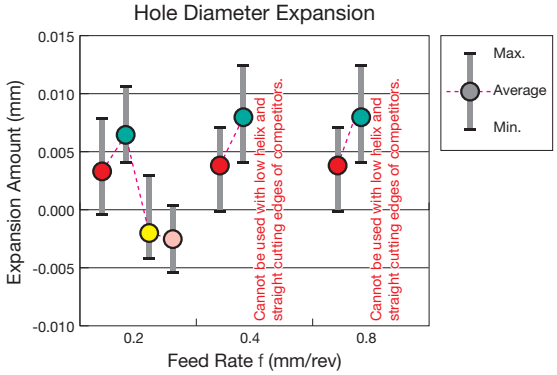
Legend (common)

Tool: MDW 0800NHGS5 (DL1300)	Work Material: ADC12
Cutting Speed: vc = 200m/min	Machine: Vertical machining centre (BT30)
Coolant: Internal supply (1.5MPa)	Coolant: Emulsion (dilute to around 25x)

Drilled hole accuracy (hole expansion)

- **Stable hole accuracy with hole expansion within 0.01mm**
  Achieves minimal expansion and stable machining from low to high feed rates

Hole Diameter Expansion



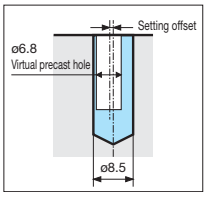
Tool: MDW 0800NHGS5 (DL1300)	Work Material: ADC12
Cutting Speed: vc = 200m/min	Machine: Vertical machining centre (BT30)
Coolant: Internal supply (1.5MPa)	Coolant: Emulsion (dilute to around 25x)

Drilled hole accuracy (hole position accuracy)

- **Pre-cast hole accuracy within ±1/10 to ±1/5 of axial offset**

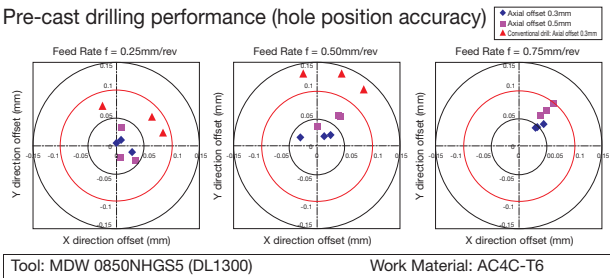
Pre-cast hole accuracy (hole position accuracy)

Offset \ Feed Rate	0.25mm/rev	0.50mm/rev	0.75mm/rev
0.3mm	±0.03mm	±0.04mm	±0.06mm
0.5mm	±0.05mm	±0.07mm	±0.10mm
Conventional drill: 0.3mm	±0.09mm	±0.19mm	



- Test method
  An axial offset of 0.3mm to 0.5mm is set for a virtual pre-cast hole (ø6.8) and a hole is drilled with an ø8.5 drill before measuring the deviation from the target position.

Pre-cast drilling performance (hole position accuracy)



Tool: MDW 0850NHGS5 (DL1300)	Work Material: AC4C-T6
Cutting Speed: vc = 200m/min (n = 7, 489min^{-1})	Machine: Vertical machining centre (BT30)
Coolant: Internal supply	

NHGS series (Internal Coolant Supply)

Aluminum Alloy | Copper Alloy

AURORA Coat DLC | Coolant Hole | 3D | 5D | 10D

*Refer to N36 for the tolerance of h6

Fig 1 (NHGS3/5 type, ø3.0 to 16.0mm)

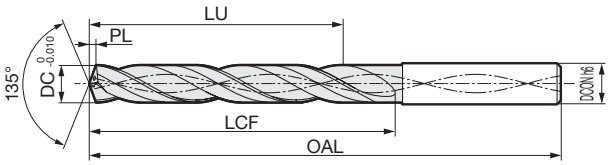
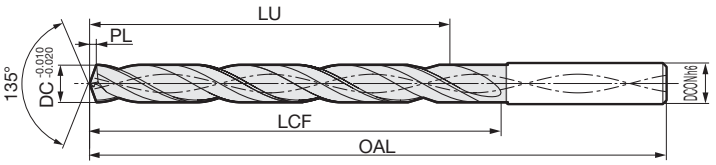


Fig 2 (NHGS10 type, ø3.0 to 16.0mm)



Diameter ø3.0 to 4.5mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
3.0	3	●	MDW 0300NHGS3	13.6	18.1	68.6	0.6	3.0	1
	5	●	0300NHGS5	24.1	28.6	78.6	0.6	3.0	1
	10	●	0300NHGS10	38.1	42.6	92.6	0.6	3.0	2
3.1	3		MDW 0310NHGS3	16.0	20.6	72.6	0.6	4.0	1
	5	●	0310NHGS5	28.0	32.6	86.6	0.6	4.0	1
	10		0310NHGS10	45.0	49.6	106.6	0.6	4.0	2
3.2	3	●	MDW 0320NHGS3	15.9	20.7	72.7	0.7	4.0	1
	5	●	0320NHGS5	27.9	32.7	86.7	0.7	4.0	1
	10	●	0320NHGS10	44.9	49.7	106.7	0.7	4.0	2
3.3	3	●	MDW 0330NHGS3	15.8	20.7	72.7	0.7	4.0	1
	5	●	0330NHGS5	27.8	32.7	86.7	0.7	4.0	1
	10		0330NHGS10	44.8	49.7	106.7	0.7	4.0	2
3.4	3		MDW 0340NHGS3	15.6	20.7	72.7	0.7	4.0	1
	5	●	0340NHGS5	27.6	32.7	86.7	0.7	4.0	1
	10	●	0340NHGS10	44.6	49.7	106.7	0.7	4.0	2
3.5	3	●	MDW 0350NHGS3	15.5	20.7	72.7	0.7	4.0	1
	5	●	0350NHGS5	27.5	32.7	86.7	0.7	4.0	1
	10	●	0350NHGS10	44.5	49.7	106.7	0.7	4.0	2
3.6	3		MDW 0360NHGS3	17.8	23.2	72.7	0.7	4.0	1
	5	●	0360NHGS5	31.3	36.7	86.7	0.7	4.0	1
	10	●	0360NHGS10	51.3	56.7	106.7	0.7	4.0	2
3.65	3	●	MDW 0365NHGS3	17.8	23.3	72.8	0.8	4.0	1
	5	●	0365NHGS5	31.3	36.8	86.8	0.8	4.0	1
	10		0365NHGS10	51.3	56.8	106.8	0.8	4.0	2
3.66	3		MDW 0366NHGS3	17.8	23.3	72.8	0.8	4.0	1
	5	●	0366NHGS5	31.3	36.8	86.8	0.8	4.0	1
	10		0366NHGS10	51.3	56.8	106.8	0.8	4.0	2
3.7	3		MDW 0370NHGS3	17.8	23.3	72.8	0.8	4.0	1
	5	●	0370NHGS5	31.3	36.8	86.8	0.8	4.0	1
	10		0370NHGS10	51.3	56.8	106.8	0.8	4.0	2
3.8	3		MDW 0380NHGS3	17.6	23.3	72.8	0.8	4.0	1
	5	●	0380NHGS5	31.1	36.8	86.8	0.8	4.0	1
	10		0380NHGS10	51.1	56.8	106.8	0.8	4.0	2
3.9	3		MDW 0390NHGS3	17.5	23.3	72.8	0.8	4.0	1
	5	●	0390NHGS5	31.0	36.8	86.8	0.8	4.0	1
	10	●	0390NHGS10	51.0	56.8	106.8	0.8	4.0	2
4.0	3	●	MDW 0400NHGS3	17.3	23.3	72.8	0.8	4.0	1
	5	●	0400NHGS5	30.8	36.8	86.8	0.8	4.0	1
	10	●	0400NHGS10	50.8	56.8	106.8	0.8	4.0	2
4.1	3	●	MDW 0410NHGS3	19.7	25.8	80.8	0.8	5.0	1
	5	●	0410NHGS5	34.7	40.8	98.8	0.8	5.0	1
	10		0410NHGS10	57.7	63.8	121.8	0.8	5.0	2
4.2	3	●	MDW 0420NHGS3	19.6	25.9	80.9	0.9	5.0	1
	5	●	0420NHGS5	34.6	40.9	98.9	0.9	5.0	1
	10		0420NHGS10	57.6	63.9	121.9	0.9	5.0	2
4.3	3		MDW 0430NHGS3	19.5	25.9	80.9	0.9	5.0	1
	5	●	0430NHGS5	34.5	40.9	98.9	0.9	5.0	1
	10		0430NHGS10	57.5	63.9	121.9	0.9	5.0	2
4.4	3		MDW 0440NHGS3	19.3	25.9	80.9	0.9	5.0	1
	5	●	0440NHGS5	34.3	40.9	98.9	0.9	5.0	1
	10		0440NHGS10	57.3	63.9	121.9	0.9	5.0	2
4.5	3	●	MDW 0450NHGS3	19.2	25.9	80.9	0.9	5.0	1
	5	●	0450NHGS5	34.2	40.9	98.9	0.9	5.0	1
	10	●	0450NHGS10	57.2	63.9	121.9	0.9	5.0	2

Grade: DL1300

Diameter ø4.6 to 6.3mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
4.6	3	●	MDW 0460NHGS3	21.6	28.5	81.0	1.0	5.0	1
	5	●	0460NHGS5	38.1	45.0	99.0	1.0	5.0	1
	10		0460NHGS10	64.1	71.0	122.0	1.0	5.0	2
4.7	3		MDW 0470NHGS3	21.5	28.5	81.0	1.0	5.0	1
	5	●	0470NHGS5	38.0	45.0	99.0	1.0	5.0	1
	10		0470NHGS10	64.0	71.0	122.0	1.0	5.0	2
4.8	3		MDW 0480NHGS3	21.3	28.5	81.0	1.0	5.0	1
	5	●	0480NHGS5	37.8	45.0	99.0	1.0	5.0	1
	10		0480NHGS10	63.8	71.0	122.0	1.0	5.0	2
4.9	3		MDW 0490NHGS3	21.2	28.5	81.0	1.0	5.0	1
	5	●	0490NHGS5	37.7	45.0	99.0	1.0	5.0	1
	10	●	0490NHGS10	63.7	71.0	122.0	1.0	5.0	2
5.0	3	●	MDW 0500NHGS3	21.0	28.5	81.0	1.0	5.0	1
	5	●	0500NHGS5	37.5	45.0	99.0	1.0	5.0	1
	10	●	0500NHGS10	63.5	71.0	122.0	1.0	5.0	2
5.1	3		MDW 0510NHGS3	21.0	28.6	83.1	1.1	6.0	1
	5	●	0510NHGS5	37.5	45.1	101.1	1.1	6.0	1
	10	●	0510NHGS10	70.5	78.1	137.1	1.1	6.0	2
5.2	3	●	MDW 0520NHGS3	20.8	28.6	83.1	1.1	6.0	1
	5	●	0520NHGS5	37.3	45.1	101.1	1.1	6.0	1
	10		0520NHGS10	70.3	78.1	137.1	1.1	6.0	2
5.3	3	●	MDW 0530NHGS3	20.7	28.6	83.1	1.1	6.0	1
	5	●	0530NHGS5	37.2	45.1	101.1	1.1	6.0	1
	10		0530NHGS10	70.2	78.1	137.1	1.1	6.0	2
5.4	3		MDW 0540NHGS3	20.5	28.6	83.1	1.1	6.0	1
	5	●	0540NHGS5	37.0	45.1	101.1	1.1	6.0	1
	10		0540NHGS10	70.0	78.1	137.1	1.1	6.0	2
5.5	3	●	MDW 0550NHGS3	20.4	28.6	83.1	1.1	6.0	1
	5	●	0550NHGS5	36.9	45.1	101.1	1.1	6.0	1
	10	●	0550NHGS10	69.9	78.1	137.1	1.1	6.0	2
5.6	3		MDW 0560NHGS3	22.8	31.2	83.2	1.2	6.0	1
	5	●	0560NHGS5	40.8	49.2	101.2	1.2	6.0	1
	10		0560NHGS10	76.8	85.2	137.2	1.2	6.0	2
5.7	3		MDW 0570NHGS3	22.7	31.2	83.2	1.2	6.0	1
	5	●	0570NHGS5	40.7	49.2	101.2	1.2	6.0	1
	10		0570NHGS10	76.7	85.2	137.2	1.2	6.0	2
5.8	3		MDW 0580NHGS3	22.5	31.2	83.2	1.2	6.0	1
	5	●	0580NHGS5	40.5	49.2	101.2	1.2	6.0	1
	10		0580NHGS10	76.5	85.2	137.2	1.2	6.0	2
5.9	3	●	MDW 0590NHGS3	22.4	31.2	83.2	1.2	6.0	1
	5	●	0590NHGS5	40.4	49.2	101.2	1.2	6.0	1
	10		0590NHGS10	76.4	85.2	137.2	1.2	6.0	2
6.0	3	●	MDW 0600NHGS3	22.2	31.2	83.2	1.2	6.0	1
	5	●	0600NHGS5	40.2	49.2	101.2	1.2	6.0	1
	10	●	0600NHGS10	76.2	85.2	137.2	1.2	6.0	2
6.1	3		MDW 0610NHGS3	24.7	33.8	89.3	1.3	7.0	1
	5	●	0610NHGS5	44.2	53.3	110.3	1.3	7.0	1
	10	●	0610NHGS10	83.2	92.3	152.3	1.3	7.0	2
6.2	3		MDW 0620NHGS3	24.5	33.8	89.3	1.3	7.0	1
	5	●	0620NHGS5	44.0	53.3	110.3	1.3	7.0	1
	10		0620NHGS10	83.0	92.3	152.3	1.3	7.0	2
6.3	3		MDW 0630NHGS3	24.4	33.8	89.3	1.3	7.0	1
	5	●	0630NHGS5	43.9	53.3	110.3	1.3	7.0	1
	10		0630NHGS10	82.9	92.3	152.3	1.3	7.0	2

Grade: DL1300

NHGS series (Internal Coolant Supply)

Aluminum Alloy | Copper Alloy

AURORA Coat DLC | Coolant Hole | 3D | 5D | 10D

*Refer to N36 for the tolerance of h6

Fig 1 (NHGS3/5 type, ø3.0 to 16.0mm)

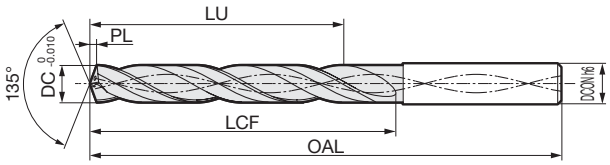
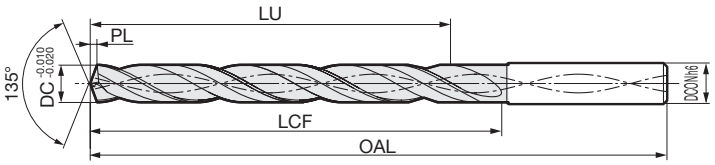


Fig 2 (NHGS10 type, ø3.0 to 16.0mm)



Diameter ø6.4 to 8.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
6.4	3		MDW 0640NHGS3	24.2	33.8	89.3	1.3	7.0	1
	5	●	0640NHGS5	43.7	53.3	110.3	1.3	7.0	1
	10		0640NHGS10	82.7	92.3	152.3	1.3	7.0	2
6.5	3	●	MDW 0650NHGS3	24.1	33.8	89.3	1.3	7.0	1
	5	●	0650NHGS5	43.6	53.3	110.3	1.3	7.0	1
	10	●	0650NHGS10	82.6	92.3	152.3	1.3	7.0	2
6.6	3		MDW 0660NHGS3	26.5	36.4	89.4	1.4	7.0	1
	5	●	0660NHGS5	47.5	57.4	110.4	1.4	7.0	1
	10		0660NHGS10	89.5	99.4	152.4	1.4	7.0	2
6.7	3	●	MDW 0670NHGS3	26.4	36.4	89.4	1.4	7.0	1
	5	●	0670NHGS5	47.4	57.4	110.4	1.4	7.0	1
	10	●	0670NHGS10	89.4	99.4	152.4	1.4	7.0	2
6.8	3	●	MDW 0680NHGS3	26.2	36.4	89.4	1.4	7.0	1
	5	●	0680NHGS5	47.2	57.4	110.4	1.4	7.0	1
	10	●	0680NHGS10	89.2	99.4	152.4	1.4	7.0	2
6.9	3		MDW 0690NHGS3	26.1	36.4	89.4	1.4	7.0	1
	5	●	0690NHGS5	47.1	57.4	110.4	1.4	7.0	1
	10		0690NHGS10	89.1	99.4	152.4	1.4	7.0	2
7.0	3	●	MDW 0700NHGS3	25.9	36.4	89.4	1.4	7.0	1
	5	●	0700NHGS5	46.9	57.4	110.4	1.4	7.0	1
	10	●	0700NHGS10	88.9	99.4	152.4	1.4	7.0	2
7.1	3		MDW 0710NHGS3	28.4	39.0	95.5	1.5	8.0	1
	5	●	0710NHGS5	50.9	61.5	119.5	1.5	8.0	1
	10		0710NHGS10	95.9	106.5	167.5	1.5	8.0	2
7.2	3		MDW 0720NHGS3	28.2	39.0	95.5	1.5	8.0	1
	5	●	0720NHGS5	50.7	61.5	119.5	1.5	8.0	1
	10	●	0720NHGS10	95.7	106.5	167.5	1.5	8.0	2
7.3	3		MDW 0730NHGS3	28.1	39.0	95.5	1.5	8.0	1
	5	●	0730NHGS5	50.6	61.5	119.5	1.5	8.0	1
	10		0730NHGS10	95.6	106.5	167.5	1.5	8.0	2
7.35	3	●	MDW 0735NHGS3	28.0	39.0	95.5	1.5	8.0	1
	5	●	0735NHGS5	50.5	61.5	119.5	1.5	8.0	1
	10		0735NHGS10	95.5	106.5	167.5	1.5	8.0	2
7.4	3	●	MDW 0740NHGS3	27.9	39.0	95.5	1.5	8.0	1
	5	●	0740NHGS5	50.4	61.5	119.5	1.5	8.0	1
	10		0740NHGS10	95.4	106.5	167.5	1.5	8.0	2
7.5	3	●	MDW 0750NHGS3	27.9	39.1	95.6	1.6	8.0	1
	5	●	0750NHGS5	50.4	61.6	119.6	1.6	8.0	1
	10	●	0750NHGS10	95.4	106.6	167.6	1.6	8.0	2
7.6	3		MDW 0760NHGS3	30.2	41.6	95.6	1.6	8.0	1
	5	●	0760NHGS5	54.2	65.6	119.6	1.6	8.0	1
	10		0760NHGS10	102.2	113.6	167.6	1.6	8.0	2
7.7	3		MDW 0770NHGS3	30.1	41.6	95.6	1.6	8.0	1
	5	●	0770NHGS5	54.1	65.6	119.6	1.6	8.0	1
	10		0770NHGS10	102.1	113.6	167.6	1.6	8.0	2
7.8	3	●	MDW 0780NHGS3	29.9	41.6	95.6	1.6	8.0	1
	5	●	0780NHGS5	53.9	65.6	119.6	1.6	8.0	1
	10	●	0780NHGS10	101.9	113.6	167.6	1.6	8.0	2
7.9	3		MDW 0790NHGS3	29.8	41.6	95.6	1.6	8.0	1
	5	●	0790NHGS5	53.8	65.6	119.6	1.6	8.0	1
	10		0790NHGS10	101.8	113.6	167.6	1.6	8.0	2
8.0	3	●	MDW 0800NHGS3	29.7	41.7	95.7	1.7	8.0	1
	5	●	0800NHGS5	53.7	65.7	119.7	1.7	8.0	1
	10	●	0800NHGS10	101.7	113.7	167.7	1.7	8.0	2

Grade: DL1300

Diameter ø8.1 to 9.7mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
8.1	3		MDW 0810NHGS3	32.1	44.2	101.7	1.7	9.0	1
	5	●	0810NHGS5	57.6	69.7	128.7	1.7	9.0	1
	10		0810NHGS10	108.6	120.7	182.7	1.7	9.0	2
8.2	3		MDW 0820NHGS3	31.9	44.2	101.7	1.7	9.0	1
	5	●	0820NHGS5	57.4	69.7	128.7	1.7	9.0	1
	10		0820NHGS10	108.4	120.7	182.7	1.7	9.0	2
8.3	3		MDW 0830NHGS3	31.8	44.2	101.7	1.7	9.0	1
	5	●	0830NHGS5	57.3	69.7	128.7	1.7	9.0	1
	10		0830NHGS10	108.3	120.7	182.7	1.7	9.0	2
8.4	3		MDW 0840NHGS3	31.6	44.2	101.7	1.7	9.0	1
	5	●	0840NHGS5	57.1	69.7	128.7	1.7	9.0	1
	10		0840NHGS10	108.1	120.7	182.7	1.7	9.0	2
8.5	3	●	MDW 0850NHGS3	31.6	44.3	101.8	1.8	9.0	1
	5	●	0850NHGS5	57.1	69.8	128.8	1.8	9.0	1
	10	●	0850NHGS10	108.1	120.8	182.8	1.8	9.0	2
8.6	3	●	MDW 0860NHGS3	33.9	46.8	101.8	1.8	9.0	1
	5	●	0860NHGS5	60.9	73.8	128.8	1.8	9.0	1
	10		0860NHGS10	114.9	127.8	182.8	1.8	9.0	2
8.7	3		MDW 0870NHGS3	33.8	46.8	101.8	1.8	9.0	1
	5	●	0870NHGS5	60.8	73.8	128.8	1.8	9.0	1
	10		0870NHGS10	114.8	127.8	182.8	1.8	9.0	2
8.8	3	●	MDW 0880NHGS3	33.6	46.8	101.8	1.8	9.0	1
	5	●	0880NHGS5	60.6	73.8	128.8	1.8	9.0	1
	10		0880NHGS10	114.6	127.8	182.8	1.8	9.0	2
8.9	3		MDW 0890NHGS3	33.5	46.8	101.8	1.8	9.0	1
	5	●	0890NHGS5	60.5	73.8	128.8	1.8	9.0	1
	10		0890NHGS10	114.5	127.8	182.8	1.8	9.0	2
9.0	3	●	MDW 0900NHGS3	33.4	46.9	101.9	1.9	9.0	1
	5	●	0900NHGS5	60.4	73.9	128.9	1.9	9.0	1
	10	●	0900NHGS10	114.4	127.9	182.9	1.9	9.0	2
9.1	3		MDW 0910NHGS3	35.8	49.4	107.9	1.9	10.0	1
	5	●	0910NHGS5	64.3	77.9	137.9	1.9	10.0	1
	10		0910NHGS10	121.3	134.9	197.9	1.9	10.0	2
9.2	3		MDW 0920NHGS3	35.6	49.4	107.9	1.9	10.0	1
	5	●	0920NHGS5	64.1	77.9	137.9	1.9	10.0	1
	10		0920NHGS10	121.1	134.9	197.9	1.9	10.0	2
9.21	3	●	MDW 0921NHGS3	35.6	49.4	107.9	1.9	10.0	1
	5	●	0921NHGS5	64.1	77.9	137.9	1.9	10.0	1
	10		0921NHGS10	121.1	134.9	197.9	1.9	10.0	2
9.3	3		MDW 0930NHGS3	35.5	49.4	107.9	1.9	10.0	1
	5	●	0930NHGS5	64.0	77.9	137.9	1.9	10.0	1
	10		0930NHGS10	121.0	134.9	197.9	1.9	10.0	2
9.4	3	●	MDW 0940NHGS3	35.3	49.4	107.9	1.9	10.0	1
	5	●	0940NHGS5	63.8	77.9	137.9	1.9	10.0	1
	10		0940NHGS10	120.8	134.9	197.9	1.9	10.0	2
9.5	3	●	MDW 0950NHGS3	35.3	49.5	108.0	2.0	10.0	1
	5	●	0950NHGS5	63.8	78.0	138.0	2.0	10.0	1
	10	●	0950NHGS10	120.8	135.0	198.0	2.0	10.0	2
9.6	3		MDW 0960NHGS3	37.6	52.0	108.0	2.0	10.0	1
	5	●	0960NHGS5	67.6	82.0	138.0	2.0	10.0	1
	10		0960NHGS10	127.6	142.0	198.0	2.0	10.0	2
9.7	3		MDW 0970NHGS3	37.5	52.0	108.0	2.0	10.0	1
	5	●	0970NHGS5	67.5	82.0	138.0	2.0	10.0	1
	10		0970NHGS10	127.5	142.0	198.0	2.0	10.0	2

Grade: DL1300

NHGS series (Internal Coolant Supply)

Aluminum Alloy | Copper Alloy

AURORA Coat DLC | Coolant Hole | 3D | 5D | 10D

*Refer to N36 for the tolerance of h6

Fig 1 (NHGS3/5 type, ø3.0 to 16.0mm)

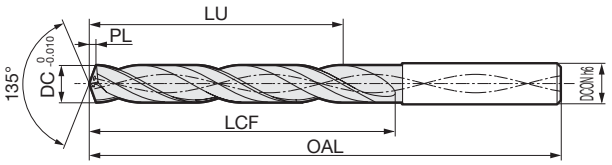
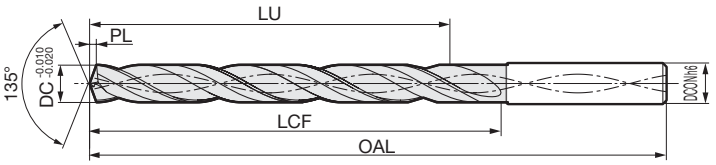


Fig 2 (NHGS10 type, ø3.0 to 16.0mm)



Diameter ø9.8 to 11.4mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3		MDW 0980NHGS3	37.3	52.0	108.0	2.0	10.0	1
9.8	5	●	0980NHGS5	67.3	82.0	138.0	2.0	10.0	1
	10	●	0980NHGS10	127.3	142.0	198.0	2.0	10.0	2
	3		MDW 0990NHGS3	37.2	52.0	108.0	2.0	10.0	1
9.9	5	●	0990NHGS5	67.2	82.0	138.0	2.0	10.0	1
	10		0990NHGS10	127.2	142.0	198.0	2.0	10.0	2
	3	●	MDW 1000NHGS3	37.1	52.1	108.1	2.1	10.0	1
10.0	5	●	1000NHGS5	67.1	82.1	138.1	2.1	10.0	1
	10	●	1000NHGS10	127.1	142.1	198.1	2.1	10.0	2
	3	●	MDW 1010NHGS3	39.5	54.6	118.1	2.1	11.0	1
10.1	5		1010NHGS5	71.0	86.1	151.1	2.1	11.0	1
	10		1010NHGS10	134.0	149.1	217.1	2.1	11.0	2
	3		MDW 1020NHGS3	39.3	54.6	118.1	2.1	11.0	1
10.2	5		1020NHGS5	70.8	86.1	151.1	2.1	11.0	1
	10		1020NHGS10	133.8	149.1	217.1	2.1	11.0	2
	3	●	MDW 1030NHGS3	39.2	54.6	118.1	2.1	11.0	1
10.3	5	●	1030NHGS5	70.7	86.1	151.1	2.1	11.0	1
	10		1030NHGS10	133.7	149.1	217.1	2.1	11.0	2
	3		MDW 1040NHGS3	39.1	54.7	118.2	2.2	11.0	1
10.4	5	●	1040NHGS5	70.6	86.2	151.2	2.2	11.0	1
	10		1040NHGS10	133.6	149.2	217.2	2.2	11.0	2
	3	●	MDW 1050NHGS3	39.0	54.7	118.2	2.2	11.0	1
10.5	5	●	1050NHGS5	70.5	86.2	151.2	2.2	11.0	1
	10	●	1050NHGS10	133.5	149.2	217.2	2.2	11.0	2
	3	●	MDW 1060NHGS3	41.3	57.2	118.2	2.2	11.0	1
10.6	5	●	1060NHGS5	74.3	90.2	151.2	2.2	11.0	1
	10		1060NHGS10	140.3	156.2	217.2	2.2	11.0	2
	3		MDW 1070NHGS3	41.2	57.2	118.2	2.2	11.0	1
10.7	5		1070NHGS5	74.2	90.2	151.2	2.2	11.0	1
	10		1070NHGS10	140.2	156.2	217.2	2.2	11.0	2
	3		MDW 1080NHGS3	41.0	57.2	118.2	2.2	11.0	1
10.8	5		1080NHGS5	74.0	90.2	151.2	2.2	11.0	1
	10		1080NHGS10	140.0	156.2	217.2	2.2	11.0	2
	3		MDW 1090NHGS3	41.0	57.3	118.3	2.3	11.0	1
10.9	5		1090NHGS5	74.0	90.3	151.3	2.3	11.0	1
	10		1090NHGS10	140.0	156.3	217.3	2.3	11.0	2
	3	●	MDW 1100NHGS3	40.8	57.3	118.3	2.3	11.0	1
11.0	5	●	1100NHGS5	73.8	90.3	151.3	2.3	11.0	1
	10	●	1100NHGS10	139.8	156.3	217.3	2.3	11.0	2
	3	●	MDW 1108NHGS3	43.2	59.8	124.3	2.3	12.0	1
11.08	5	●	1108NHGS5	77.7	94.3	160.3	2.3	12.0	1
	10		1108NHGS10	146.7	163.3	232.3	2.3	12.0	2
	3	●	MDW 1110NHGS3	43.2	59.8	124.3	2.3	12.0	1
11.1	5	●	1110NHGS5	77.7	94.3	160.3	2.3	12.0	1
	10		1110NHGS10	146.7	163.3	232.3	2.3	12.0	2
	3	●	MDW 1120NHGS3	43.0	59.8	124.3	2.3	12.0	1
11.2	5	●	1120NHGS5	77.5	94.3	160.3	2.3	12.0	1
	10		1120NHGS10	146.5	163.3	232.3	2.3	12.0	2
	3		MDW 1130NHGS3	42.9	59.8	124.3	2.3	12.0	1
11.3	5		1130NHGS5	77.4	94.3	160.3	2.3	12.0	1
	10		1130NHGS10	146.4	163.3	232.3	2.3	12.0	2
	3	●	MDW 1140NHGS3	42.8	59.9	124.4	2.4	12.0	1
11.4	5	●	1140NHGS5	77.3	94.4	160.4	2.4	12.0	1
	10		1140NHGS10	146.3	163.4	232.4	2.4	12.0	2

Grade: DL1300

Diameter ø11.5 to 13.1mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3	●	MDW 1150NHGS3	42.7	59.9	124.4	2.4	12.0	1
11.5	5	●	1150NHGS5	77.2	94.4	160.4	2.4	12.0	1
	10	●	1150NHGS10	146.2	163.4	232.4	2.4	12.0	2
	3		MDW 1160NHGS3	45.0	62.4	124.4	2.4	12.0	1
11.6	5		1160NHGS5	81.0	98.4	160.4	2.4	12.0	1
	10		1160NHGS10	153.0	170.4	232.4	2.4	12.0	2
	3		MDW 1170NHGS3	44.9	62.4	124.4	2.4	12.0	1
11.7	5		1170NHGS5	80.9	98.4	160.4	2.4	12.0	1
	10		1170NHGS10	152.9	170.4	232.4	2.4	12.0	2
	3		MDW 1180NHGS3	44.7	62.4	124.4	2.4	12.0	1
11.8	5		1180NHGS5	80.7	98.4	160.4	2.4	12.0	1
	10		1180NHGS10	152.7	170.4	232.4	2.4	12.0	2
	3		MDW 1190NHGS3	44.7	62.5	124.5	2.5	12.0	1
11.9	5		1190NHGS5	80.7	98.5	160.5	2.5	12.0	1
	10		1190NHGS10	152.7	170.5	232.5	2.5	12.0	2
	3	●	MDW 1200NHGS3	44.5	62.5	124.5	2.5	12.0	1
12.0	5	●	1200NHGS5	80.5	98.5	160.5	2.5	12.0	1
	10	●	1200NHGS10	152.5	170.5	232.5	2.5	12.0	2
	3	●	MDW 1210NHGS3	46.9	65.0	130.5	2.5	13.0	1
12.1	5	●	1210NHGS5	84.4	102.5	169.5	2.5	13.0	1
	10		1210NHGS10	159.4	177.5	247.5	2.5	13.0	2
	3		MDW 1220NHGS3	46.7	65.0	130.5	2.5	13.0	1
12.2	5		1220NHGS5	84.2	102.5	169.5	2.5	13.0	1
	10		1220NHGS10	159.2	177.5	247.5	2.5	13.0	2
	3	●	MDW 1230NHGS3	46.6	65.0	130.5	2.5	13.0	1
12.3	5	●	1230NHGS5	84.1	102.5	169.5	2.5	13.0	1
	10		1230NHGS10	159.1	177.5	247.5	2.5	13.0	2
	3		MDW 1240NHGS3	46.5	65.1	130.6	2.6	13.0	1
12.4	5		1240NHGS5	84.0	102.6	169.6	2.6	13.0	1
	10		1240NHGS10	159.0	177.6	247.6	2.6	13.0	2
	3	●	MDW 1250NHGS3	46.4	65.1	130.6	2.6	13.0	1
12.5	5	●	1250NHGS5	83.9	102.6	169.6	2.6	13.0	1
	10	●	1250NHGS10	158.9	177.6	247.6	2.6	13.0	2
	3		MDW 1260NHGS3	48.7	67.6	130.6	2.6	13.0	1
12.6	5		1260NHGS5	87.7	106.6	169.6	2.6	13.0	1
	10		1260NHGS10	165.7	184.6	247.6	2.6	13.0	2
	3		MDW 1270NHGS3	48.6	67.6	130.6	2.6	13.0	1
12.7	5		1270NHGS5	87.6	106.6	169.6	2.6	13.0	1
	10		1270NHGS10	165.6	184.6	247.6	2.6	13.0	2
	3		MDW 1280NHGS3	48.4	67.6	130.6	2.6	13.0	1
12.8	5		1280NHGS5	87.4	106.6	169.6	2.6	13.0	1
	10		1280NHGS10	165.4	184.6	247.6	2.6	13.0	2
	3		MDW 1290NHGS3	48.4	67.7	130.7	2.7	13.0	1
12.9	5		1290NHGS5	87.4	106.7	169.7	2.7	13.0	1
	10		1290NHGS10	165.4	184.7	247.7	2.7	13.0	2
	3	●	MDW 1296NHGS3	48.3	67.7	130.7	2.7	13.0	1
12.96	5	●	1296NHGS5	87.3	106.7	169.7	2.7	13.0	1
	10		1296NHGS10	165.3	184.7	247.7	2.7	13.0	2
	3	●	MDW 1300NHGS3	48.2	67.7	130.7	2.7	13.0	1
13.0	5	●	1300NHGS5	87.2	106.7	169.7	2.7	13.0	1
	10	●	1300NHGS10	165.2	184.7	247.7	2.7	13.0	2
	3		MDW 1310NHGS3	50.6	70.2	136.7	2.7	14.0	1
13.1	5		1310NHGS5	91.1	110.7	178.7	2.7	14.0	1
	10		1310NHGS10	172.1	191.7	262.7	2.7	14.0	2

Grade: DL1300

NHGS series (Internal Coolant Supply)

Aluminum Alloy | Copper Alloy

AURORA Coat DLC | Coolant Hole | 3D | 5D | 10D

*Refer to N36 for the tolerance of h6

Fig 1 (NHGS3/5 type, ø3.0 to 16.0mm)

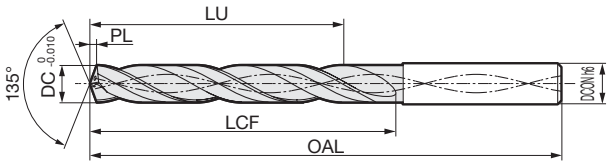
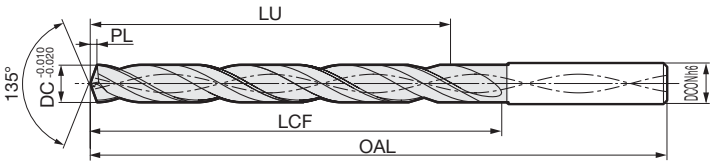


Fig 2 (NHGS10 type, ø3.0 to 16.0mm)



Diameter ø13.2 to 14.9mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3		**MDW 1320NHGS3**	50.4	70.2	136.7	2.7	14.0	1
13.2	5		**1320NHGS5**	90.9	110.7	178.7	2.7	14.0	1
	10		**1320NHGS10**	171.9	191.7	262.7	2.7	14.0	2
	3		**MDW 1330NHGS3**	50.4	70.3	136.8	2.8	14.0	1
13.3	5		**1330NHGS5**	90.9	110.8	178.8	2.8	14.0	1
	10		**1330NHGS10**	171.9	191.8	262.8	2.8	14.0	2
	3		**MDW 1340NHGS3**	50.2	70.3	136.8	2.8	14.0	1
13.4	5		**1340NHGS5**	90.7	110.8	178.8	2.8	14.0	1
	10		**1340NHGS10**	171.7	191.8	262.8	2.8	14.0	2
	3	●	**MDW 1350NHGS3**	50.1	70.3	136.8	2.8	14.0	1
13.5	5	●	**1350NHGS5**	90.6	110.8	178.8	2.8	14.0	1
	10		**1350NHGS10**	171.6	191.8	262.8	2.8	14.0	2
	3		**MDW 1360NHGS3**	52.4	72.8	136.8	2.8	14.0	1
13.6	5		**1360NHGS5**	94.4	114.8	178.8	2.8	14.0	1
	10		**1360NHGS10**	178.4	198.8	262.8	2.8	14.0	2
	3		**MDW 1370NHGS3**	52.3	72.8	136.8	2.8	14.0	1
13.7	5		**1370NHGS5**	94.3	114.8	178.8	2.8	14.0	1
	10		**1370NHGS10**	178.3	198.8	262.8	2.8	14.0	2
	3		**MDW 1380NHGS3**	52.2	72.9	136.9	2.9	14.0	1
13.8	5		**1380NHGS5**	94.2	114.9	178.9	2.9	14.0	1
	10		**1380NHGS10**	178.2	198.9	262.9	2.9	14.0	2
	3		**MDW 1390NHGS3**	52.1	72.9	136.9	2.9	14.0	1
13.9	5		**1390NHGS5**	94.1	114.9	178.9	2.9	14.0	1
	10		**1390NHGS10**	178.1	198.9	262.9	2.9	14.0	2
	3	●	**MDW 1400NHGS3**	51.9	72.9	136.9	2.9	14.0	1
14.0	5	●	**1400NHGS5**	93.9	114.9	178.9	2.9	14.0	1
	10		**1400NHGS10**	177.9	198.9	262.9	2.9	14.0	2
	3	●	**MDW 1410NHGS3**	54.3	75.4	142.9	2.9	15.0	1
14.1	5	●	**1410NHGS5**	97.8	118.9	187.9	2.9	15.0	1
	10		**1410NHGS10**	184.8	205.9	277.9	2.9	15.0	2
	3		**MDW 1420NHGS3**	54.1	75.4	142.9	2.9	15.0	1
14.2	5		**1420NHGS5**	97.6	118.9	187.9	2.9	15.0	1
	10		**1420NHGS10**	184.6	205.9	277.9	2.9	15.0	2
	3		**MDW 1430NHGS3**	54.1	75.5	143.0	3.0	15.0	1
14.3	5		**1430NHGS5**	97.6	119.0	188.0	3.0	15.0	1
	10		**1430NHGS10**	184.6	206.0	278.0	3.0	15.0	2
	3		**MDW 1440NHGS3**	53.9	75.5	143.0	3.0	15.0	1
14.4	5		**1440NHGS5**	97.4	119.0	188.0	3.0	15.0	1
	10		**1440NHGS10**	184.4	206.0	278.0	3.0	15.0	2
	3	●	**MDW 1450NHGS3**	53.8	75.5	143.0	3.0	15.0	1
14.5	5	●	**1450NHGS5**	97.3	119.0	188.0	3.0	15.0	1
	10		**1450NHGS10**	184.3	206.0	278.0	3.0	15.0	2
	3		**MDW 1460NHGS3**	56.1	78.0	143.0	3.0	15.0	1
14.6	5		**1460NHGS5**	101.1	123.0	188.0	3.0	15.0	1
	10		**1460NHGS10**	191.1	213.0	278.0	3.0	15.0	2
	3		**MDW 1470NHGS3**	56.0	78.0	143.0	3.0	15.0	1
14.7	5		**1470NHGS5**	101.0	123.0	188.0	3.0	15.0	1
	10		**1470NHGS10**	191.0	213.0	278.0	3.0	15.0	2
	3		**MDW 1480NHGS3**	55.9	78.1	143.1	3.1	15.0	1
14.8	5		**1480NHGS5**	100.9	123.1	188.1	3.1	15.0	1
	10		**1480NHGS10**	190.9	213.1	278.1	3.1	15.0	2
	3	●	**MDW 1490NHGS3**	55.8	78.1	143.1	3.1	15.0	1
14.9	5	●	**1490NHGS5**	100.8	123.1	188.1	3.1	15.0	1
	10		**1490NHGS10**	190.8	213.1	278.1	3.1	15.0	2

Grade: DL1300

Diameter ø14.96 to 16.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	3	●	**MDW 1496NHGS3**	55.7	78.1	143.1	3.1	15.0	1
14.96	5	●	**1496NHGS5**	100.7	123.1	188.1	3.1	15.0	1
	10		**1496NHGS10**	190.7	213.1	278.1	3.1	15.0	2
	3	●	**MDW 1500NHGS3**	55.6	78.1	143.1	3.1	15.0	1
15.0	5	●	**1500NHGS5**	100.6	123.1	188.1	3.1	15.0	1
	10		**1500NHGS10**	190.6	213.1	278.1	3.1	15.0	2
	3		**MDW 1510NHGS3**	58.0	80.6	149.1	3.1	16.0	1
15.1	5		**1510NHGS5**	104.5	127.1	197.1	3.1	16.0	1
	10		**1510NHGS10**	197.5	220.1	293.1	3.1	16.0	2
	3		**MDW 1520NHGS3**	57.8	80.6	149.1	3.1	16.0	1
15.2	5		**1520NHGS5**	104.3	127.1	197.1	3.1	16.0	1
	10		**1520NHGS10**	197.3	220.1	293.1	3.1	16.0	2
	3		**MDW 1530NHGS3**	57.8	80.7	149.2	3.2	16.0	1
15.3	5		**1530NHGS5**	104.3	127.2	197.2	3.2	16.0	1
	10		**1530NHGS10**	197.3	220.2	293.2	3.2	16.0	2
	3		**MDW 1540NHGS3**	57.6	80.7	149.2	3.2	16.0	1
15.4	5		**1540NHGS5**	104.1	127.2	197.2	3.2	16.0	1
	10		**1540NHGS10**	197.1	220.2	293.2	3.2	16.0	2
	3	●	**MDW 1550NHGS3**	57.5	80.7	149.2	3.2	16.0	1
15.5	5	●	**1550NHGS5**	104.0	127.2	197.2	3.2	16.0	1
	10		**1550NHGS10**	197.0	220.2	293.2	3.2	16.0	2
	3		**MDW 1560NHGS3**	59.8	83.2	149.2	3.2	16.0	1
15.6	5		**1560NHGS5**	107.8	131.2	197.2	3.2	16.0	1
	10		**1560NHGS10**	203.8	227.2	293.2	3.2	16.0	2
	3		**MDW 1570NHGS3**	59.7	83.2	149.2	3.2	16.0	1
15.7	5		**1570NHGS5**	107.7	131.2	197.2	3.2	16.0	1
	10		**1570NHGS10**	203.7	227.2	293.2	3.2	16.0	2
	3		**MDW 1580NHGS3**	59.6	83.3	149.3	3.3	16.0	1
15.8	5		**1580NHGS5**	107.6	131.3	197.3	3.3	16.0	1
	10		**1580NHGS10**	203.6	227.3	293.3	3.3	16.0	2
	3		**MDW 1590NHGS3**	59.5	83.3	149.3	3.3	16.0	1
15.9	5		**1590NHGS5**	107.5	131.3	197.3	3.3	16.0	1
	10		**1590NHGS10**	203.5	227.3	293.3	3.3	16.0	2
	3	●	**MDW 1600NHGS3**	59.3	83.3	149.3	3.3	16.0	1
16.0	5	●	**1600NHGS5**	107.3	131.3	197.3	3.3	16.0	1
	10		**1600NHGS10**	203.3	227.3	293.3	3.3	16.0	2

Grade: DL1300

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Aluminum alloy castings/ aluminum alloy die castings	Wrought Aluminum Alloy
ø6.0	n	7,400	6,400
	vc	80 - **140** - 200	80 - **120** - 200
	f	0.2 - **0.4** - 0.6	0.2 - **0.3** - 0.4
ø10.0	n	5,700	4,800
	vc	100 - **180** - 250	100 - **150** - 250
	f	0.4 - **0.6** - 0.8	0.2 - **0.35** - 0.5
ø16.0	n	4,000	3,600
	vc	120 - **200** - 250	120 - **180** - 250
	f	0.4 - **0.7** - 1.0	0.3 - **0.45** - 0.6

Min. - **Optimum** - Max.

SDC series (External Coolant Supply)

Aluminum Alloy | Composite CFRP

■ General Features

SUMIDIA Coat SDC series drills for carbon fibre reinforced plastic (CFRP) employ our proprietary multi-stepped point angle.
Combined with a diamond coating, improved drilled hole quality and long tool life can be achieved.

■ Product Range

Cat. No.	Diameter Range (mm)	Point Angle	Hole Depth (L/D)
MDS□□□□□SDC3	ø2.0 to ø4.0	90°	up to 3
	ø4.851 to ø10.0	130°	

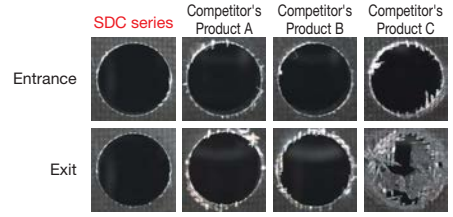
■ Features and Applications

- Excellent Drilled Hole Quality
  - · Sharp cutting edge shape reduces delamination of fibre layers and minimizes burrs.
  - · Continuously changing point angle, disperses the load placed on the cutting edge and preventing breakage.
- Long Tool Life
  - · Utilises high-strength diamond coating with excellent adhesion, delivering high quality and long tool life.

■ Performance

Comparison of Machined Surface Quality

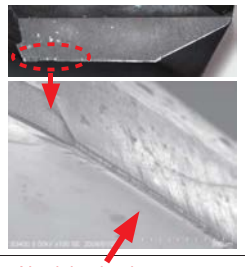
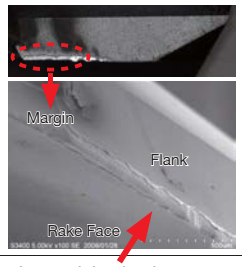
Excellent drilled hole surface quality
Prevents Delamination and Burrs



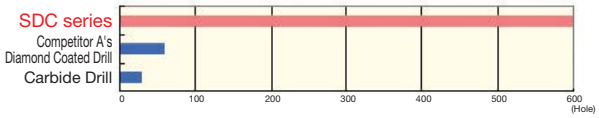
Tool : SUMIDIA Coat Drill SDC series ø6.35
Work Material : CFRP
Cutting Conditions : n =6,000min^{-1}, f =0.1mm/rev, H =28mm (through)
Dry

Tool Life Comparison

Effects of Diamond Coating

SDC series (After Drilling 600 Holes)	Competitor's Product (After Drilling 50 Holes)
	
No delamination Minimal flank wear	Large delamination from cutting edge to flank

Stable diamond layer adhesion prevents delamination.
Excellent wear resistance enables high-quality drilling with long tool life.



Tool : SUMIDIA Coat Drill ø6.35
Work Material : CFRP
Cutting Conditions : n =6,000min^{-1}, f =0.075mm/rev, H =15mm (through)
Dry

SUMIDIA Coat 3D

*Refer to N36 for the tolerance of h6 and h8

Fig 1 (Diameter ø2.0 to 4.0mm)

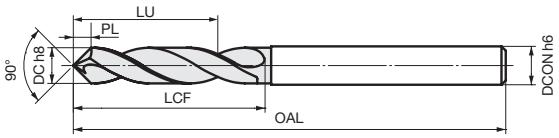
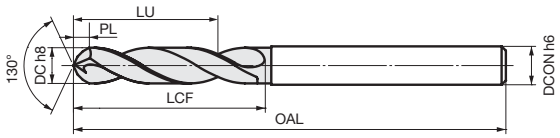


Fig 2 (Diameter ø4.851 to 10.0mm)



Diameter ø2.0 to 10.0mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
2.0	3	●	MDS 02000SDC3	10.50	13.5	50.0	1.0	2.0	1
2.489	3	●	02489SDC3	12.47	16.2	50.2	1.2	2.489	1
3.0	3	●	03000SDC3	14.5	19.0	50.5	1.5	3.0	1
3.300	3	●	03300SDC3	16.8	21.7	61.7	1.7	3.300	1
4.0	3	●	04000SDC3	18.5	24.5	62.0	2.0	4.0	1
4.851	3	●	04851SDC3	21.3	28.6	77.1	1.1	4.851	2
5.0	3	●	05000SDC3	21.2	28.7	77.2	1.2	5.0	2
5.6	3	●	05600SDC3	22.9	31.3	82.3	1.3	5.6	2
6.0	3	●	06000SDC3	22.4	31.4	82.4	1.4	6.0	2
6.375	3	●	06375SDC3	24.4	34.0	84.5	1.5	6.375	2
7.0	3	●	07000SDC3	26.1	36.6	84.6	1.6	7.0	2
7.938	3	●	07938SDC3	30.0	41.9	91.9	1.9	7.938	2
8.0	3	●	08000SDC3	29.9	41.9	91.9	1.9	8.0	2
9.0	3	●	09000SDC3	33.6	47.1	100.1	2.1	9.0	2
9.550	3	●	09550SDC3	37.9	52.2	107.2	2.2	9.550	2
10.0	3	●	10000SDC3	37.3	52.3	107.3	2.3	10.0	2

Grade: DCX20

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

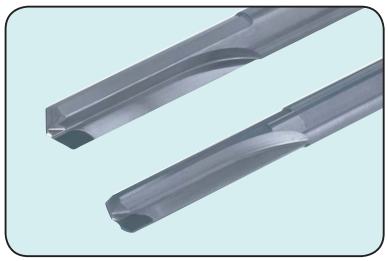
Diameter DC (mm)	Cutting Conditions	CFRP Only (Dry Drilling)	Stacked Sheets of CFRP and Aluminum Alloys (Dry Drilling)
ø6.0	n	6,400	3,200
	vc	80 - **120** - 150	40 - **60** - 80
	f	0.05 - **0.08** - 0.10	0.03 - **0.05** - 0.10
ø12.0	n	2,700	1,600
	vc	80 - **100** - 120	40 - **60** - 80
	f	0.05 - **0.08** - 0.10	0.03 - **0.05** - 0.10

Min. - **Optimum** - Max.

DAL/DDL series

Aluminum Alloy | Composite CFRP

PCD 3D



From General to High Precision Drilling of Aluminum Alloys

- High precision DAL series is able to produce holes of IT Class of 7 to 8.
- General DDL series is able to produce holes of IT class 11 to 12, mainly for pre-tap hole drilling.

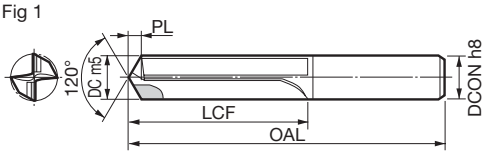
DAL series

*Refer to N36 for the tolerance of m5, h8 Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	
	Roughing	

Cat. No.	DA2200	Dia. (Shank Dia.) DC(DCON)	Flute Length LCF	Overall Length OAL	Tip PL	Fig
DAL 0500H to 0600H		ø5 ≤ DC ≤ ø6	31.6	81.6	1.6	1
0601H to 0700H		ø6 < DC ≤ ø7	36.9	91.9	1.9	1
0701H to 0800H		ø7 < DC ≤ ø8	37.2	92.2	2.2	1
0801H to 0900H		ø8 < DC ≤ ø9	42.5	102.5	2.5	1
0901H to 1000H		ø9 < DC ≤ ø10	42.8	102.8	2.8	1
1001H to 1100H		ø10 < DC ≤ ø11	53.1	113.1	3.1	1
1101H to 1200H		ø11 < DC ≤ ø12	53.4	113.4	3.4	1

Fig 1



Ordering numbers should be handled according to this example: ø6.05mm drill → DAL0605H.

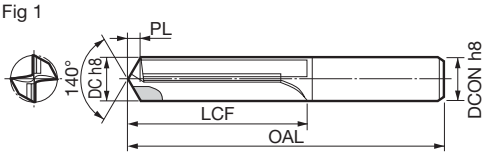
DDL series

*Refer to N36 for the tolerance of h8 Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	
	Roughing	

Cat. No.	DA2200	Dia. (Shank Dia.) DC(DCON)	Flute Length LCF	Overall Length OAL	Tip PL	Fig
DDL 050V to 060V		ø5 ≤ DC ≤ ø6	31.5	81.0	1.0	1
061V to 070V		ø6 < DC ≤ ø7	36.2	91.2	1.2	1
071V to 080V		ø7 < DC ≤ ø8	36.4	91.4	1.4	1
081V to 090V		ø8 < DC ≤ ø9	41.6	101.6	1.6	1
091V to 100V		ø9 < DC ≤ ø10	41.7	101.7	1.7	1
101V to 110V		ø10 < DC ≤ ø11	51.9	111.9	1.9	1
111V to 120V		ø11 < DC ≤ ø12	52.1	112.1	2.1	1

Fig 1



Ordering numbers should be handled according to this example: ø10.5mm drill → DDL105V.

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	DAL series	DDL series	Depth of Cut	Oil
ø8.0	n	4,000	8,000	L/D= Below 3	Emulsion type
	vc	80 - **100** - 150	150 - **200** - 250		
	f	0.05 - **0.1** - 0.15	0.1 - **0.15** - 0.25		
ø12.0	n	2,700	5,300		
	vc	80 - **100** - 150	150 - **200** - 250		
	f	0.08 - **0.13** - 0.2	0.15 - **0.2** - 0.3		

Min. - **Optimum** - Max.

Important Notes

- When using DAL series for high-precision machining, select a high rigidity machine and high precision holder.
- Supply coolant generously at the entrance of the hole.

MLDH-L/MLDH-P type

■ Features

Micro Long Drills are oil-hole drills for high-efficiency drilling developed for drilling deep, small-diameter holes. Featuring improved drill strength, often a problem area with small drills.

● Deep hole drilling
Flute shape ensures good drill rigidity and chip evacuation.
High-efficiency drilling to depths of over 20 times the diameter at over vf = 500mm/min
(equivalent to blade diameter ø1.3 SUS416).
Optimal thinning and edge balance for stable chip control.

● Long tool life
Special coating provides long tool life with a wide variety of work materials.
Improved chip evacuation makes it possible to reduce spindle load fluctuation, ensuring stable tool life.

■ Product Range

Applications	Cat. No.	Diameter Range (mm)	Hole Depth (L/D)	Number of items
Deep Hole Drilling	MLDH□□□□L5	ø0.8 to 2.0	up to 5	41 items in stock
	MLDH□□□□L12	ø0.8 to 2.0	up to 12	41 items in stock
	MLDH□□□□L20	ø0.8 to 2.0	up to 20	41 items in stock
	MLDH□□□□L30	ø0.8 to 2.0	up to 30	41 items in stock
For Guide Hole	MLDH□□□□P	ø0.8 to 2.0	up to 2	41 items in stock

■ Recommended Cutting Conditions

MLDH-P type / MLDH-L5 type

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel up to 200HB	General Steel up to 250HB	Alloy Steel up to 300HB	Stainless Steel up to 200HB	Cast Iron FC/FCD	Aluminum Alloy	Heat-resistant Steel
ø1.0	n	16,000	16,000	16,000	9,500	16,000	19,000	3,200
	vc	40 - **50** - 60	40 - **50** - 60	40 - **50** - 60	20 - **30** - 40	40 - **50** - 60	50 - **60** - 70	5 - **10** - 15
	f	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.02 - **0.03** - 0.04	0.03 - **0.04** - 0.06	0.005 - **0.01** - 0.02
ø1.5	n	11,000	11,000	11,000	6,400	11,000	13,000	2,100
	vc	40 - **50** - 60	40 - **50** - 60	40 - **50** - 60	20 - **30** - 40	40 - **50** - 60	50 - **60** - 70	5 - **10** - 15
	f	0.04 - **0.08** - 0.12	0.04 - **0.08** - 0.12	0.04 - **0.08** - 0.12	0.02 - **0.05** - 0.10	0.04 - **0.08** - 0.12	0.05 - **0.10** - 0.15	0.01 - **0.03** - 0.05
ø2.0	n	8,000	8,000	8,000	4,800	8,000	9,500	1,600
	vc	40 - **50** - 60	40 - **50** - 60	40 - **50** - 60	20 - **30** - 40	40 - **50** - 60	50 - **60** - 70	5 - **10** - 15
	f	0.06 - **0.08** - 0.12	0.06 - **0.08** - 0.12	0.06 - **0.08** - 0.12	0.04 - **0.06** - 0.10	0.06 - **0.08** - 0.12	0.08 - **0.12** - 0.15	0.01 - **0.03** - 0.05

Min. - **Optimum** - Max.

MLDH-L12 type / MLDH-L20 type / MLDH-L30 type

Diameter DC (mm)	Cutting Conditions	Mild Steel up to 200HB	General Steel up to 250HB	Alloy Steel up to 300HB	Stainless Steel up to 200HB	Cast Iron FC/FCD	Aluminum Alloy	Heat-resistant Steel
ø1.0	n	16,000	16,000	16,000	9,500	16,000	19,000	3,200
	vc	40 - **50** - 60	40 - **50** - 60	40 - **50** - 60	20 - **30** - 40	40 - **50** - 60	50 - **60** - 70	5 - **10** - 15
	f	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.01 - **0.02** - 0.03	0.02 - **0.03** - 0.04	0.03 - **0.04** - 0.06	0.005 - **0.01** - 0.02
ø1.5	n	11,000	11,000	11,000	6,400	11,000	13,000	2,100
	vc	40 - **50** - 60	40 - **50** - 60	40 - **50** - 60	20 - **30** - 40	40 - **50** - 60	50 - **60** - 70	5 - **10** - 15
	f	0.03 - **0.05** - 0.07	0.03 - **0.05** - 0.07	0.03 - **0.05** - 0.07	0.02 - **0.04** - 0.07	0.04 - **0.07** - 0.10	0.05 - **0.08** - 0.12	0.01 - **0.02** - 0.03
ø2.0	n	8,000	8,000	8,000	4,800	8,000	9,500	1,600
	vc	40 - **50** - 60	40 - **50** - 60	40 - **50** - 60	20 - **30** - 40	40 - **50** - 60	50 - **60** - 70	5 - **10** - 15
	f	0.04 - **0.06** - 0.08	0.04 - **0.06** - 0.08	0.04 - **0.06** - 0.08	0.04 - **0.06** - 0.08	0.04 - **0.07** - 0.10	0.05 - **0.08** - 0.12	0.01 - **0.02** - 0.03

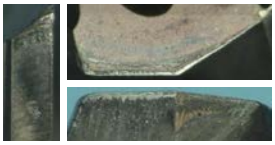
Min. - **Optimum** - Max.

* If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available. In this case, the tool life may be shortened.

■ Application Examples

● Automotive component molds (equivalent to SUS416)

Tool : MLDH 1400L20 (guide: MLDH1400P)
Machine : Vertical machining centre (HSKA63)
Coolant : Internal coolant supply (emulsion type, pump source pressure: 4MPa)
Cutting Conditions : vc = 60m/min, f = 0.03mm/rev, H = 21mm
Tool Life : 600 holes (11.4m)



● Tooling components (equivalent to SKD11)

Tool : MLDH 1900L20 (guide: MLDH1900P)
Machine : Vertical machining centre (HSKA63)
Coolant : Internal coolant supply (emulsion type, pump source pressure: 4MPa)
Cutting Conditions: vc = 60m/min, f = 0.10mm/rev, H = 27mm
Tool life : 600 units (18m)

MLDH-L/MLDH-P type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

PVD Coat | Coolant Hole | 5D | 12D | 20D | 30D | Pilot 2D

Fig 1 (MLDH-P type)

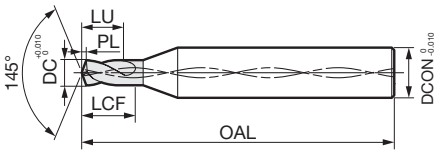
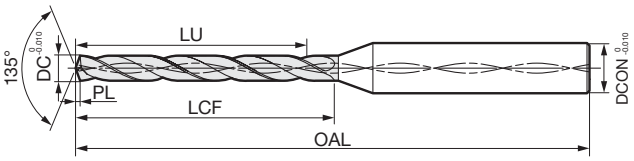


Fig 2 (MLDH-L type)



Diameter ø0.80 to 0.90mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	2	●	**MLDH 0800P**	2.0	3.2	45	0.1	3.0	1
	5	●	**0800L5**	6.8	8	50.0	0.2	3.0	2
0.80	12	●	**0800L12**	12.8	14	55	0.2	3.0	2
	20	●	**0800L20**	17.8	19	60	0.2	3.0	2
	30	●	**0800L30**	26.8	28	70	0.2	3.0	2
	2	●	**MLDH 0810P**	2.0	3.2	45	0.1	3.0	1
	5	●	**0810L5**	7.8	9	50.0	0.2	3.0	2
0.81	12	●	**0810L12**	12.8	14	55	0.2	3.0	2
	20	●	**0810L20**	17.8	19	60	0.2	3.0	2
	30	●	**0810L30**	26.8	28	70	0.2	3.0	2
	2	●	**MLDH 0820P**	2.1	3.3	45	0.1	3.0	1
	5	●	**0820L5**	7.8	9	50.0	0.2	3.0	2
0.82	12	●	**0820L12**	12.8	14	55	0.2	3.0	2
	20	●	**0820L20**	18.8	20	60	0.2	3.0	2
	30	●	**0820L30**	26.8	28	70	0.2	3.0	2
	2	●	**MLDH 0830P**	2.1	3.3	45	0.1	3.0	1
	5	●	**0830L5**	7.8	9	50.0	0.2	3.0	2
0.83	12	●	**0830L12**	12.8	14	55	0.2	3.0	2
	20	●	**0830L20**	18.8	20	60	0.2	3.0	2
	30	●	**0830L30**	26.8	28	70	0.2	3.0	2
	2	●	**MLDH 0840P**	2.1	3.4	45	0.1	3.0	1
	5	●	**0840L5**	7.7	9	50.0	0.2	3.0	2
0.84	12	●	**0840L12**	12.7	14	55	0.2	3.0	2
	20	●	**0840L20**	18.7	20	60	0.2	3.0	2
	30	●	**0840L30**	27.7	29	70	0.2	3.0	2
	2	●	**MLDH 0850P**	2.1	3.4	45	0.1	3.0	1
	5	●	**0850L5**	7.7	9	50.0	0.2	3.0	2
0.85	12	●	**0850L12**	12.7	14	55	0.2	3.0	2
	20	●	**0850L20**	18.7	20	60	0.2	3.0	2
	30	●	**0850L30**	27.7	29	70	0.2	3.0	2
	2	●	**MLDH 0860P**	2.1	3.4	45	0.1	3.0	1
	5	●	**0860L5**	7.7	9	50.0	0.2	3.0	2
0.86	12	●	**0860L12**	13.7	15	55	0.2	3.0	2
	20	●	**0860L20**	19.7	21	65	0.2	3.0	2
	30	●	**0860L30**	27.7	29	70	0.2	3.0	2
	2	●	**MLDH 0870P**	2.2	3.5	45	0.1	3.0	1
	5	●	**0870L5**	7.7	9	50.0	0.2	3.0	2
0.87	12	●	**0870L12**	13.7	15	55	0.2	3.0	2
	20	●	**0870L20**	19.7	21	65	0.2	3.0	2
	30	●	**0870L30**	28.7	30	70	0.2	3.0	2
	2	●	**MLDH 0880P**	2.2	3.5	45	0.1	3.0	1
	5	●	**0880L5**	7.7	9	50.0	0.2	3.0	2
0.88	12	●	**0880L12**	13.7	15	55	0.2	3.0	2
	20	●	**0880L20**	19.7	21	65	0.2	3.0	2
	30	●	**0880L30**	28.7	30	70	0.2	3.0	2
	2	●	**MLDH 0890P**	2.3	3.6	45	0.1	3.0	1
	5	●	**0890L5**	7.7	9	50.0	0.2	3.0	2
0.89	12	●	**0890L12**	13.7	15	55	0.2	3.0	2
	20	●	**0890L20**	19.7	21	65	0.2	3.0	2
	30	●	**0890L30**	28.7	30	70	0.2	3.0	2
	2	●	**MLDH 0900P**	2.3	3.6	45	0.1	3.0	1
	5	●	**0900L5**	7.7	10	50.0	0.2	3.0	2
0.90	12	●	**0900L12**	13.7	15	55	0.2	3.0	2
	20	●	**0900L20**	20.7	22	65	0.2	3.0	2
	30	●	**0900L30**	29.7	31	75	0.2	3.0	2

Part Number Suffix - P: For Guide Hole
Grade: ACV70

Diameter ø0.91 to 1.05mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	2	●	**MLDH 0910P**	2.2	3.6	45	0.1	3.0	1
	5	●	**0910L5**	8.6	10	50.0	0.2	3.0	2
0.91	12	●	**0910L12**	13.6	15	55	0.2	3.0	2
	20	●	**0910L20**	20.6	22	65	0.2	3.0	2
	30	●	**0910L30**	29.6	31	75	0.2	3.0	2
	2	●	**MLDH 0920P**	2.3	3.7	45	0.1	3.0	1
	5	●	**0920L5**	8.6	10	50.0	0.2	3.0	2
0.92	12	●	**0920L12**	14.6	16	60	0.2	3.0	2
	20	●	**0920L20**	20.6	22	65	0.2	3.0	2
	30	●	**0920L30**	29.6	31	75	0.2	3.0	2
	2	●	**MLDH 0930P**	2.3	3.7	45	0.1	3.0	1
	5	●	**0930L5**	8.6	10	50.0	0.2	3.0	2
0.93	12	●	**0930L12**	14.6	16	60	0.2	3.0	2
	20	●	**0930L20**	20.6	22	65	0.2	3.0	2
	30	●	**0930L30**	30.6	32	75	0.2	3.0	2
	2	●	**MLDH 0940P**	2.4	3.8	45	0.1	3.0	1
	5	●	**0940L5**	8.6	10	50.0	0.2	3.0	2
0.94	12	●	**0940L12**	14.6	16	60	0.2	3.0	2
	20	●	**0940L20**	21.6	23	65	0.2	3.0	2
	30	●	**0940L30**	30.6	32	75	0.2	3.0	2
	2	●	**MLDH 0950P**	2.4	3.8	45	0.2	3.0	1
	5	●	**0950L5**	8.6	10	50.0	0.2	3.0	2
0.95	12	●	**0950L12**	14.6	16	60	0.2	3.0	2
	20	●	**0950L20**	21.6	23	65	0.2	3.0	2
	30	●	**0950L30**	30.6	32	75	0.2	3.0	2
	2	●	**MLDH 0960P**	2.4	3.8	45	0.2	3.0	1
	5	●	**0960L5**	8.6	10	50.0	0.2	3.0	2
0.96	12	●	**0960L12**	14.6	16	60	0.2	3.0	2
	20	●	**0960L20**	21.6	23	65	0.2	3.0	2
	30	●	**0960L30**	31.6	33	75	0.2	3.0	2
	2	●	**MLDH 0970P**	2.4	3.9	45	0.2	3.0	1
	5	●	**0970L5**	8.5	10	50.0	0.2	3.0	2
0.97	12	●	**0970L12**	14.5	16	60	0.2	3.0	2
	20	●	**0970L20**	21.5	23	65	0.2	3.0	2
	30	●	**0970L30**	31.5	33	75	0.2	3.0	2
	2	●	**MLDH 0980P**	2.4	3.9	45	0.2	3.0	1
	5	●	**0980L5**	8.5	10	50.0	0.2	3.0	2
0.98	12	●	**0980L12**	15.5	17	60	0.2	3.0	2
	20	●	**0980L20**	22.5	24	65	0.2	3.0	2
	30	●	**0980L30**	31.5	33	75	0.2	3.0	2
	2	●	**MLDH 0990P**	2.5	4	45	0.2	3.0	1
	5	●	**0990L5**	8.5	10	50.0	0.2	3.0	2
0.99	12	●	**0990L12**	15.5	17	60	0.2	3.0	2
	20	●	**0990L20**	22.5	24	65	0.2	3.0	2
	30	●	**0990L30**	32.5	34	75	0.2	3.0	2
	2	●	**MLDH 1000P**	2.5	4	45	0.2	3.0	1
	5	●	**1000L5**	8.5	10	50.0	0.2	3.0	2
1.00	12	●	**1000L12**	15.5	17	60	0.2	3.0	2
	20	●	**1000L20**	22.5	24	65	0.2	3.0	2
	30	●	**1000L30**	32.5	34	75	0.2	3.0	2
	2	●	**MLDH 1050P**	2.6	4.2	45	0.2	3.0	1
	5	●	**1050L5**	10.4	12	55.0	0.2	3.0	2
1.05	12	●	**1050L12**	16.4	18	60	0.2	3.0	2
	20	●	**1050L20**	23.4	25	65	0.2	3.0	2
	30	●	**1050L30**	34.4	36	80	0.2	3.0	2

Part Number Suffix - P: For Guide Hole
Grade: ACV70

Made-to-order items: Inquire about production of drills in tool diameters and lengths that are not listed in the dimensions above or not in stock.

MLDH-L/MLDH-P type (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

PVD Coat | Coolant Hole | 5D | 12D | 20D | 30D | Pilot 2D

Fig 1 (MLDH-P type)

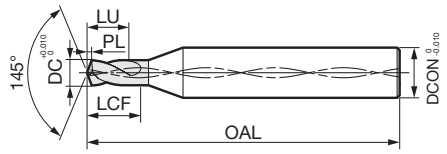
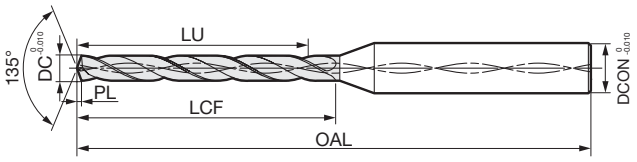


Fig 2 (MLDH-L type)



Diameter ø1.10 to 1.60mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	2	●	**MLDH 1100P**	2.8	4.4	45	0.2	3.0	1
	5	●	**1100L5**	10.4	12	55.0	0.2	3.0	2
1.10	12	●	**1100L12**	17.4	19	60	0.2	3.0	2
	20	●	**1100L20**	24.4	26	70	0.2	3.0	2
	30	●	**1100L30**	35.4	37	80	0.2	3.0	2
	2	●	**MLDH 1150P**	2.9	4.5	45	0.2	3.0	1
	5	●	**1150L5**	10.3	12	55.0	0.2	3.0	2
1.15	12	●	**1150L12**	18.3	20	60	0.2	3.0	2
	20	●	**1150L20**	26.3	28	70	0.2	3.0	2
	30	●	**1150L30**	37.3	39	80	0.2	3.0	2
	2	●	**MLDH 1200P**	3.0	4.8	45	0.2	3.0	1
	5	●	**1200L5**	10.2	12	55.0	0.2	3.0	2
1.20	12	●	**1200L12**	18.2	20	60	0.2	3.0	2
	20	●	**1200L20**	27.2	29	70	0.2	3.0	2
	30	●	**1200L30**	39.2	41	85	0.2	3.0	2
	2	●	**MLDH 1250P**	3.1	8	45	0.2	3.0	1
	5	●	**1250L5**	12.1	14	55.0	0.3	3.0	2
1.25	12	●	**1250L12**	19.1	21	65	0.3	3.0	2
	20	●	**1250L20**	28.1	30	70	0.3	3.0	2
	30	●	**1250L30**	41.1	43	85	0.3	3.0	2
	2	●	**MLDH 1300P**	3.3	5.2	45	0.2	3.0	1
	5	●	**1300L5**	12.1	14	55.0	0.3	3.0	2
1.30	12	●	**1300L12**	20.1	22	65	0.3	3.0	2
	20	●	**1300L20**	29.1	31	75	0.3	3.0	2
	30	●	**1300L30**	42.1	44	85	0.3	3.0	2
	2	●	**MLDH 1350P**	3.4	5.4	45	0.2	3.0	1
	5	●	**1350L5**	12.0	14	55.0	0.3	3.0	2
1.35	12	●	**1350L12**	21.0	23	65	0.3	3.0	2
	20	●	**1350L20**	30.0	32	75	0.3	3.0	2
	30	●	**1350L30**	44.0	46	90	0.3	3.0	2
	2	●	**MLDH 1400P**	3.5	5.6	45	0.2	3.0	1
	5	●	**1400L5**	11.9	14	55.0	0.3	3.0	2
1.40	12	●	**1400L12**	21.9	24	65	0.3	3.0	2
	20	●	**1400L20**	31.9	34	75	0.3	3.0	2
	30	●	**1400L30**	45.9	48	90	0.3	3.0	2
	2	●	**MLDH 1450P**	3.6	5.8	45	0.2	3.0	1
	5	●	**1450L5**	13.8	16	55.0	0.3	3.0	2
1.45	12	●	**1450L12**	22.8	25	65	0.3	3.0	2
	20	●	**1450L20**	32.8	35	75	0.3	3.0	2
	30	●	**1450L30**	46.8	49	90	0.3	3.0	2
	2	●	**MLDH 1500P**	3.8	6	45	0.2	3.0	1
	5	●	**1500L5**	13.8	16	55.0	0.3	3.0	2
1.50	12	●	**1500L12**	23.8	26	65	0.3	3.0	2
	20	●	**1500L20**	33.8	36	75	0.3	3.0	2
	30	●	**1500L30**	48.8	51	90	0.3	3.0	2
	2	●	**MLDH 1550P**	3.9	6.2	45	0.2	3.0	1
	5	●	**1550L5**	13.7	16	55.0	0.3	3.0	2
1.55	12	●	**1550L12**	23.7	26	65	0.3	3.0	2
	20	●	**1550L20**	34.7	37	80	0.3	3.0	2
	30	●	**1550L30**	50.7	53	95	0.3	3.0	2
	2	●	**MLDH 1600P**	4.0	6.4	45	0.3	3.0	1
	5	●	**1600L5**	13.6	16	55.0	0.3	3.0	2
1.60	12	●	**1600L12**	24.6	27	70	0.3	3.0	2
	20	●	**1600L20**	35.6	38	80	0.3	3.0	2
	30	●	**1600L30**	51.6	54	95	0.3	3.0	2

Part Number Suffix - P: For Guide Hole
Grade: ACV70

Diameter ø1.65 to 2.00mm

Dimensions (mm)

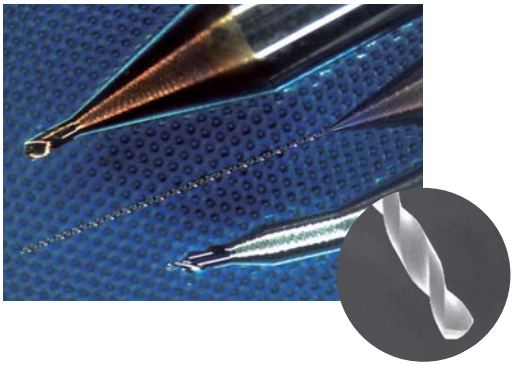
Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Flute Length LCF	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
	2	●	**MLDH 1650P**	4.1	6.6	50	0.3	3.0	1
	5	●	**1650L5**	15.5	18	60.0	0.3	3.0	2
1.65	12	●	**1650L12**	25.5	28	70	0.3	3.0	2
	20	●	**1650L20**	37.5	40	80	0.3	3.0	2
	30	●	**1650L30**	53.5	56	95	0.3	3.0	2
	2	●	**MLDH 1700P**	4.3	6.8	50	0.3	3.0	1
	5	●	**1700L5**	15.5	18	60.0	0.4	3.0	2
1.70	12	●	**1700L12**	26.5	29	70	0.4	3.0	2
	20	●	**1700L20**	38.5	41	80	0.4	3.0	2
	30	●	**1700L30**	55.5	58	100	0.4	3.0	2
	2	●	**MLDH 1750P**	4.4	7	50	0.3	3.0	1
	5	●	**1750L5**	15.4	18	60.0	0.4	3.0	2
1.75	12	●	**1750L12**	27.4	30	70	0.4	3.0	2
	20	●	**1750L20**	39.4	42	85	0.4	3.0	2
	30	●	**1750L30**	57.4	60	100	0.4	3.0	2
	2	●	**MLDH 1800P**	4.5	7.2	50	0.3	3.0	1
	5	●	**1800L5**	15.3	18	60.0	0.4	3.0	2
1.80	12	●	**1800L12**	28.3	31	70	0.4	3.0	2
	20	●	**1800L20**	40.3	43	85	0.4	3.0	2
	30	●	**1800L30**	58.3	61	100	0.4	3.0	2
	2	●	**MLDH 1850P**	4.6	7.4	50	0.3	3.0	1
	5	●	**1850L5**	17.2	20	60.0	0.4	3.0	2
1.85	12	●	**1850L12**	28.2	31	70	0.4	3.0	2
	20	●	**1850L20**	41.2	44	85	0.4	3.0	2
	30	●	**1850L30**	59.2	62	103	0.4	3.0	2
	2	●	**MLDH 1900P**	4.8	7.6	50	0.3	3.0	1
	5	●	**1900L5**	17.2	20	60.0	0.4	3.0	2
1.90	12	●	**1900L12**	29.2	32	75	0.4	3.0	2
	20	●	**1900L20**	43.2	46	85	0.4	3.0	2
	30	●	**1900L30**	60.2	63	103	0.4	3.0	2
	2	●	**MLDH 1950P**	4.9	7.8	50	0.3	3.0	1
	5	●	**1950L5**	17.1	20	60.0	0.4	3.0	2
1.95	12	●	**1950L12**	30.1	33	75	0.4	3.0	2
	20	●	**1950L20**	44.1	47	85	0.4	3.0	2
	30	●	**1950L30**	61.1	64	103	0.4	3.0	2
	2	●	**MLDH 2000P**	5.0	8	50	0.3	3.0	1
	5	●	**2000L5**	17.0	20	60.0	0.4	3.0	2
2.00	12	●	**2000L12**	31.0	34	75	0.4	3.0	2
	20	●	**2000L20**	45.0	48	90	0.4	3.0	2
	30	●	**2000L30**	63.0	66	103	0.4	3.0	2

Part Number Suffix - P: For Guide Hole
Grade: ACV70

MDUS series/MDUP series/MDSS series

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Stainless Steel | Aluminum Alloy | Copper Alloy

For Steel, Stainless Steel and Other Metals



■ Micro MULTIDRILL MDUS seires ø0.03 to ø0.19mm

- High-precision shank (Shank tolerance h3, circularity 0.3μm or less, cylindricity 0.5μm or less)
- Ultra-thin TiAlN coating gives improved wear resistance
- Perfect for drilling steel, stainless steel, or copper
- Available from ø0.03mm to ø0.19mm in 0.005mm increments

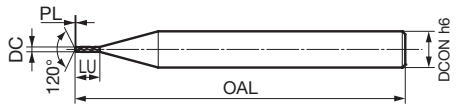
■ Micro Multi Pointing Drill MDUP seires ø0.03 to ø0.18mm

- For drilling guide hole for MDUS series drills

PVD Coat | Pilot 1D

*Refer to N36 for the tolerance of h6

Fig 1 (Helix Angle: 30°)



DC	Tolerance
Less than 0.1	From -0.005 to -0.010
0.1 or more	From -0.010 to -0.015

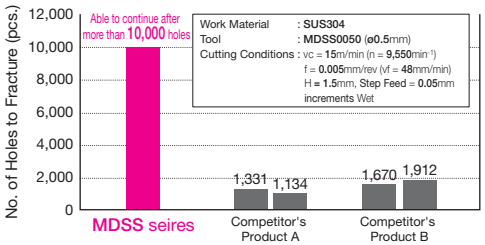
Micro Multi Pointing Drill MDUP seires Diameter ø0.03 to 0.18mm Dimensions (mm)

Dia. DC	Stock	Cat. No.	Effective Length LU	Overall Length OAL	Tip PL	Shank Dia. DCON	Fig
0.03	●	**MDUP 0030-30C**	0.02	**38.2**	0.01	3.0	1
0.04	●	**0040-30C**	0.04	**38.2**	0.01	3.0	1
0.05	●	**0050-30C**	0.05	**38.2**	0.01	3.0	1
0.08	●	**0080-30C**	0.06	**38.2**	0.02	3.0	1
0.10	●	**0100-30C**	0.10	**38.2**	0.03	3.0	1
0.12	●	**0120-30C**	0.08	**38.2**	0.03	3.0	1
0.15	●	**0150-30C**	0.08	**38.2**	0.04	3.0	1
0.18	●	**0180-30C**	0.17	**38.2**	0.05	3.0	1

Grade: KP011

■ Solid Carbide MINI-MULTIDRILL MDSS seires ø0.20 to ø1.00mm

- The combination of a hard, tough carbide substrate and a high-rigidity design (web thickness, flute width ratio, helix angle) greatly improves fracture resistance.
- PVD coating dedicated for small drills significantly extends tool life
- Applicable to a wide range of work materials including carbon steel, alloy steel, die steel, and stainless steel
- Shanks standardised to ø3mm diameter and overall length of 38mm for greater ease of use.



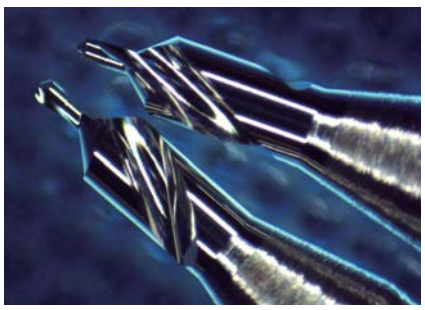
MDSS Recommended Cutting Conditions (Wet) (Inquire about cutting conditions for the MDUS series)

Work Material / Cutting Conditions / Dia. DC (mm)	Alloy Steel, Pre-hardened Steel SCM,NAK			Die Steel, Tempered Steel (30 to 40HRC)			Stainless Steel SUS		
	Spindle Speed min^{-1}	Feed Rate mm/min	Step Feed (mm)	Spindle Speed min^{-1}	Feed Rate mm/min	Step Feed (mm)	Spindle Speed min^{-1}	Feed Rate mm/min	Step Feed (mm)
ø0.2	26,500	50	0.1D	21,200	40	0.1D	10,600	20	0.1D
ø0.3	26,500	80		21,200	60		10,600	30	
ø0.4	25,900	100		19,900	80		9,500	40	
ø0.5	25,500	150		19,100	110		9,500	50	
ø1.0	15,900	240	0.2D to 0.5D*	12,700	190	0.2D to 0.5D*	5,600	80	

1. The conditions at left are recommended under wet conditions, using water-soluble coolant.
2. If cutting noise and vibration are present, please adjust the cutting conditions accordingly.
3. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available. In this case, lower the feed rate by the same ratio.

* Step feed is recommended for drilling of holes deeper than 3D (D=drill diameter).

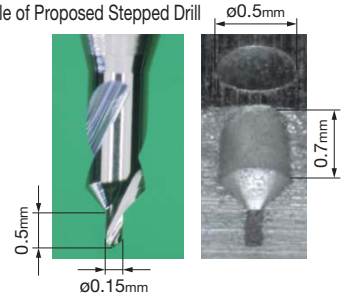
For Ceramics and Non-metals



■ Made-to-order Fine Drills ø0.02mm up

- Dedicated cutting edge designs are available for various work materials including non-metals, ceramics, and resins.
- Customised designs are also available for improved efficiency, such as integration of processes by using a stepped drill.
- Various drill diameters (from ø0.02) and LxDs are available to order. (Contact us for possible profiles.)

Example of Proposed Stepped Drill



MDUS series/MDSS series (External Coolant Supply/Small Diameter type)

MDUS: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Stainless Steel | Aluminum Alloy | Copper Alloy

MDSS: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Hardened Steel from 46HRC | Stainless Steel | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

PVD Coat | FB Coat | 10D

*Refer to N36 for the tolerance of h6

Fig 1 (ø0.030 to 0.190mm)

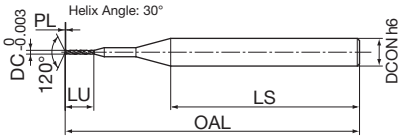


Fig 2 (ø0.20 to 0.34mm)

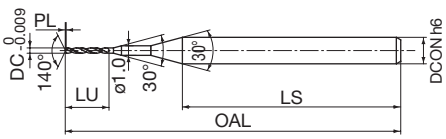
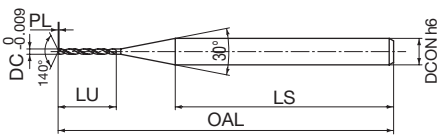


Fig 3 (ø0.35 to 1.00mm)



Diameter ø0.030 to 0.49mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Overall Length OAL	Tip PL	Shank LS	Shank Dia. DCON	Fig
0.030		●	MDUS 0030-30C	0.26	38.0	0.01	28	3.0	1
0.035			0035-30C	0.35	38.0	0.01	28	3.0	1
0.040	10	●	0040-30C	0.34	38.0	0.01	28	3.0	1
0.045			0045-30C	0.46	38.0	0.01	28	3.0	1
0.050		●	0050-30C	0.45	38.0	0.01	28	3.0	1
0.055			MDUS 0055-30C	0.55	38.0	0.02	28	3.0	1
0.060			0060-30C	0.54	38.0	0.02	28	3.0	1
0.065			0065-30C	0.64	38.0	0.02	28	3.0	1
0.070	10		0070-30C	0.63	38.0	0.02	28	3.0	1
0.075			0075-30C	0.73	38.0	0.02	28	3.0	1
0.080		●	0080-30C	0.72	38.0	0.02	28	3.0	1
0.085			0085-30C	0.92	38.0	0.02	28	3.0	1
0.090			MDUS 0090-30C	0.91	38.0	0.03	28	3.0	1
0.095			0095-30C	0.91	38.0	0.03	28	3.0	1
0.100	10	●	0100-30C	0.90	38.0	0.03	28	3.0	1
0.110			0110-30C	1.09	38.0	0.03	28	3.0	1
0.120		●	0120-30C	1.08	38.0	0.03	28	3.0	1
0.130			MDUS 0130-30C	1.37	38.0	0.04	28	3.0	1
0.140	10		0140-30C	1.36	38.0	0.04	28	3.0	1
0.150		●	0150-30C	1.35	38.0	0.04	28	3.0	1
0.160			MDUS 0160-30C	1.64	38.0	0.05	28	3.0	1
0.170	10		0170-30C	1.63	38.0	0.05	28	3.0	1
0.180		●	0180-30C	1.62	38.0	0.05	28	3.0	1
0.190			0190-30C	1.71	38.0	0.05	28	3.0	1
0.20		●	MDSS 0020	2.25	38	0.04	28	3.0	2
0.21		●	0021	2.24	38	0.04	28	3.0	2
0.22	10	●	0022	2.23	38	0.04	28	3.0	2
0.23		●	0023	2.21	38	0.04	28	3.0	2
0.24		●	0024	2.20	38	0.04	28	3.0	2
0.25		●	MDSS 0025	2.19	38	0.05	28	3.0	2
0.26		●	0026	2.18	38	0.05	28	3.0	2
0.27	10	●	0027	2.16	38	0.05	28	3.0	2
0.28		●	0028	2.15	38	0.05	28	3.0	2
0.29		●	0029	2.14	38	0.05	28	3.0	2
0.30		●	0030	2.6	38	0.05	28	3.0	2
0.31		●	MDSS 0031	2.6	38	0.06	28	3.0	2
0.32		●	0032	2.6	38	0.06	28	3.0	2
0.33	10	●	0033	2.6	38	0.06	28	3.0	2
0.34		●	0034	2.6	38	0.06	28	3.0	2
0.35		●	0035	3.6	38	0.06	28	3.0	3
0.36		●	MDSS 0036	3.6	38	0.07	28	3.0	3
0.37		●	0037	3.5	38	0.07	28	3.0	3
0.38	10	●	0038	3.5	38	0.07	28	3.0	3
0.39		●	0039	3.5	38	0.07	28	3.0	3
0.40		●	0040	4.5	38	0.07	28	3.0	3
0.41		●	0041	4.5	38	0.07	28	3.0	3
0.42		●	MDSS 0042	4.5	38	0.08	28	3.0	3
0.43		●	0043	4.5	38	0.08	28	3.0	3
0.44	10	●	0044	4.5	38	0.08	28	3.0	3
0.45		●	0045	4.4	38	0.08	28	3.0	3
0.46		●	0046	4.4	38	0.08	28	3.0	3
0.47		●	MDSS 0047	4.4	38	0.09	28	3.0	3
0.48	10	●	0048	4.4	38	0.09	28	3.0	3
0.49		●	0049	4.4	38	0.09	28	3.0	3

Grade: MDUS series KP011 / MDSS series ACF40B

Diameter ø0.50 to 1.00mm

Dimensions (mm)

Dia. DC	Hole Depth (L/D)	Stock	Cat. No.	Effective Length LU	Overall Length OAL	Tip PL	Shank LS	Shank Dia. DCON	Fig
0.50		●	MDSS 0050	5.4	38	0.09	27	3.0	3
0.51	10	●	0051	5.4	38	0.09	27	3.0	3
0.52		●	0052	5.4	38	0.09	27	3.0	3
0.53		●	MDSS 0053	5.3	38	0.10	27	3.0	3
0.54		●	0054	5.3	38	0.10	27	3.0	3
0.55	10	●	0055	5.3	38	0.10	27	3.0	3
0.56		●	0056	5.3	38	0.10	27	3.0	3
0.57		●	0057	5.3	38	0.10	27	3.0	3
0.58		●	MDSS 0058	5.3	38	0.11	27	3.0	3
0.59		●	0059	5.3	38	0.11	27	3.0	3
0.60	10	●	0060	6.3	38	0.11	26	3.0	3
0.61		●	0061	6.2	38	0.11	26	3.0	3
0.62		●	0062	6.2	38	0.11	26	3.0	3
0.63		●	0063	6.2	38	0.11	26	3.0	3
0.64		●	MDSS 0064	6.2	38	0.12	26	3.0	3
0.65		●	0065	6.2	38	0.12	26	3.0	3
0.66	10	●	0066	6.2	38	0.12	26	3.0	3
0.67		●	0067	6.2	38	0.12	26	3.0	3
0.68		●	0068	6.2	38	0.12	26	3.0	3
0.69		●	MDSS 0069	6.1	38	0.13	26	3.0	3
0.70		●	0070	8.1	38	0.13	24	3.0	3
0.71	10	●	0071	8.1	38	0.13	24	3.0	3
0.72		●	0072	8.1	38	0.13	24	3.0	3
0.73		●	0073	8.1	38	0.13	24	3.0	3
0.74		●	0074	8.1	38	0.13	24	3.0	3
0.75		●	MDSS 0075	8.1	38	0.14	24	3.0	3
0.76		●	0076	8.1	38	0.14	24	3.0	3
0.77	10	●	0077	8.0	38	0.14	24	3.0	3
0.78		●	0078	8.0	38	0.14	24	3.0	3
0.79		●	0079	8.0	38	0.14	24	3.0	3
0.80		●	MDSS 0080	9.0	38	0.15	23	3.0	3
0.81		●	0081	9.0	38	0.15	23	3.0	3
0.82	10	●	0082	9.0	38	0.15	23	3.0	3
0.83		●	0083	9.0	38	0.15	23	3.0	3
0.84		●	0084	9.0	38	0.15	23	3.0	3
0.85		●	0085	8.9	38	0.15	23	3.0	3
0.86		●	MDSS 0086	8.9	38	0.16	23	3.0	3
0.87		●	0087	8.9	38	0.16	23	3.0	3
0.88	10	●	0088	8.9	38	0.16	23	3.0	3
0.89		●	0089	8.9	38	0.16	23	3.0	3
0.90		●	0090	9.9	38	0.16	22	3.0	3
0.91		●	MDSS 0091	9.9	38	0.17	22	3.0	3
0.92		●	0092	9.9	38	0.17	22	3.0	3
0.93	10	●	0093	9.8	38	0.17	22	3.0	3
0.94		●	0094	9.8	38	0.17	22	3.0	3
0.95		●	0095	9.8	38	0.17	22	3.0	3
0.96		●	0096	9.8	38	0.17	22	3.0	3
0.97		●	MDSS 0097	9.8	38	0.18	22	3.0	3
0.98	10	●	0098	9.8	38	0.18	22	3.0	3
0.99		●	0099	9.8	38	0.18	22	3.0	3
1.00		●	0100	10.8	38	0.18	21	3.0	3

Grade: MDUS series KP011 / MDSS series ACF40B

SMD series

Features

Indexable head type drills which utilises an unique radial serration mounting for high precision and strength.
An exchangeable drill head provides a new cutting edge, higher productivity and cost efficiency with easy tool management.
Regrinding allowance of 1.5mm to 3mm makes further tool cost reductions possible.* Regrinding is available only for MTL/MSL/MEL/MB

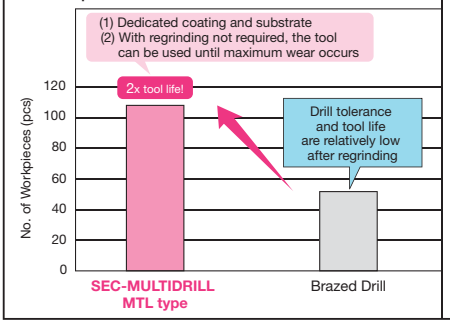
Product Range

Head	Applications	Holder (L/D)	DC Range
MTL type	General Steel	1.5D type / 1.5DF type (1.5D)	ø12.0 to ø30.8 M type / L type ø12.0 to ø42.5 D type ø13.5 to ø30.8
		M type / 3D type / 3DF type (3D)	
		L type / 5D type / 5DF type (5D)	
		D type / 8D type / 8DF type (8D)	
		12D type (12D)	
MSL type	SUS SS FC	1.5D type / 1.5DF type (1.5D)	ø12.0 to ø30.8 D type ø13.5 to ø30.8
		M type / 3D type / 3DF type (3D)	
		L type / 5D type / 5DF type (5D)	
		D type / 8D type / 8DF type (8D)	
		12D type (12D)	
MFS type	Flat Bottom Hole	1.5D type/1.5DF type	ø12.0 to ø30.0
MB type	Bridge	B3 type (3D)	ø24.5 to ø26.7

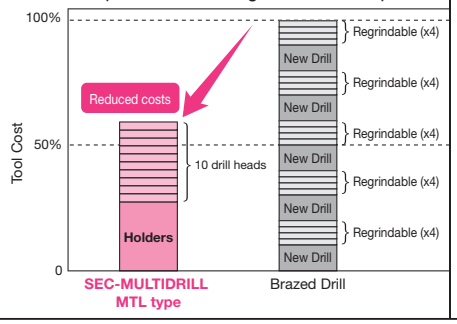
*MFS type can also be used with 3D, 5D, 8D, and 12D holders.

Tool Life and Cost

Comparison of Tool Life



Tool Comparison for Drilling of 1,000 Workpieces

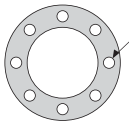


Results

For regrinding purposes, brazed drills are only used for 50-70% of their actual tool life potential. SEC-MULTIDRILL MTL type reaches 100%!

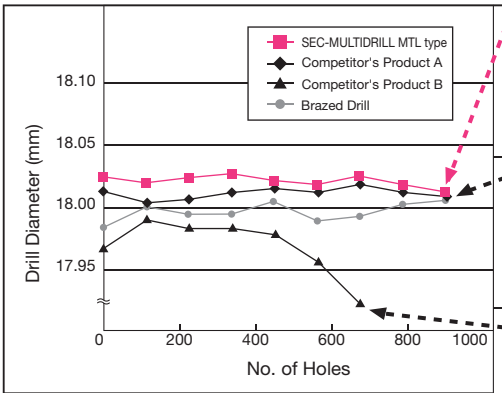
SEC-MULTIDRILL MTL type has **double the tool life of brazed drills! Shorter tool change time!**

Workpiece Example and Cutting Conditions



SEC-MultiDrill MTL type
Head: SMDT1800MTL
Holder: SMDH180M
Work Material: Machine Component (S50C) Wet

Drilling Precision



SEC-MULTIDRILL MTL type: **Normal wear**

After 900 holes (equivalent to 34m)

Comp's A: **Large wear**

After 900 holes (equivalent to 34m)

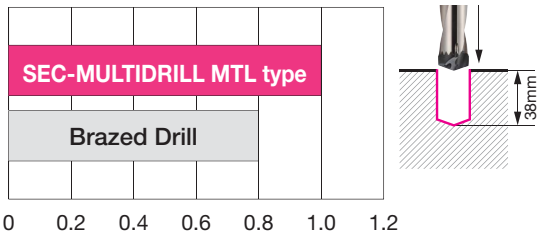
Comp's B: **Peripheral edge fracture**

After 670 holes (equivalent to 25m)

Work Material : S50C Diameter: ø18.0mm
Cutting Conditions : vc = 70m/min, f = 0.25mm/rev
Hole Depth 38mm (through) Wet

Tool Strength

Durability Comparison

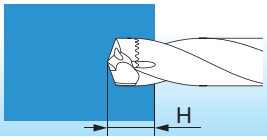


Work Material : S50C Diameter: ø16.0mm
Cutting Conditions : vc = 80m/min
Hole Depth: 38mm

Recommended Drilling Method for 8D and 12D type: Use a hydro chuck, milling chuck or collet chuck to hold the 12D drill body

(1) Use a SMDHSSS-1.5D(F) type (1.5D holder) + MTL type, MSL type (head) to drill a guide hole

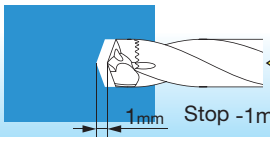
● Use a 1.5D drill body and a drill head with the same diameter (same Cat. No.) as the 8D or 12D drill when drilling a guide hole.



H = Drill diameter x 1 to 1.5 times the depth

(2) Feed the 8D or 12D holder + MTL type, MSL type (head) through the guide hole at a low spindle speed

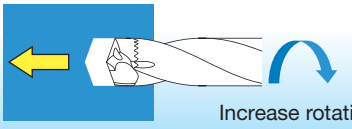
● Spindle speed: 500min^{-1} ● Feed rate: 1,000 to 2,000mm/min



Stop -1mm away from the guide hole depth

* If the drill is inserted into the guide hole at the set cutting speed, peripheral run-out may cause damage to the drill's peripheral edges.

(3) Increase spindle speed until the set spindle speed is reached, then start drilling

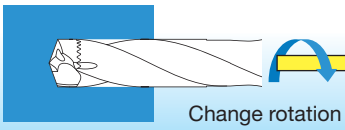


Increase rotation speed

* On some NC machine tools, the feed command may be activated before the set spindle speed is reached, so it is recommended to enter a dwell sequence before the feed command.

(4) After drilling, rotation speed is reduced and the drill is retracted from the work material

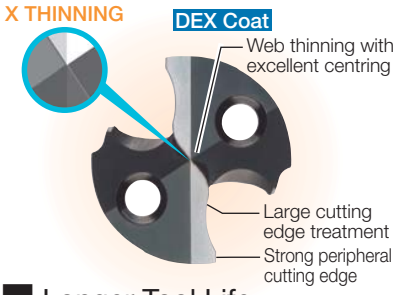
● Spindle speed: 500min^{-1} ● Feed rate: 1,000 to 2,000mm/min



Change rotation speed to 500min^{-1}

* Retracting the drill from the work material at a high spindle speed, is dangerous as doing so may result in breakage due to runout.

MTL type Suitable for high-efficiency drilling of general steel



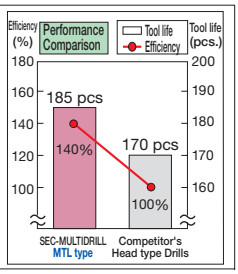
Excellent cutting edge strength
Large edge treatment is used to reduce fracture of the cutting edge.

Stable machined hole accuracy
X type thinning achieves excellent centring on drill entry and stable drilling.

Longer Tool Life

Improved tool life and efficiency

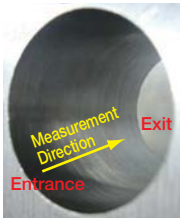
Work Material : S20C (Housing)
Tool : ø15×5D
Cutting Conditions : vc = 107m/min
f = 0.3mm/rev
Hole depth : 32mm×12 holes

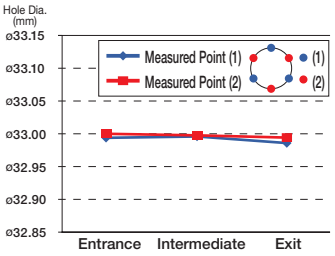


Drilling Precision

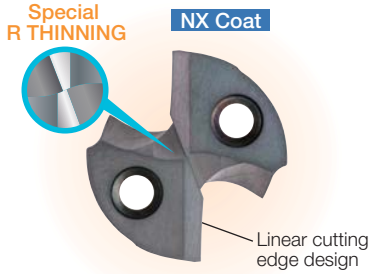
High drilling accuracy even with large diameters

Work Material : SM490
(base plate for construction machinery)
Tool : ø33×5D
Cutting Conditions : vc = 120m/min
f = 0.25mm/rev
Coolant : Emulsion type





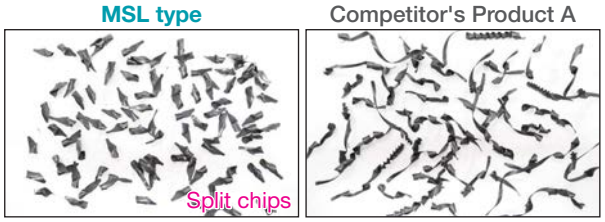
MSL type Stable drilling of mild steel, stainless steel, etc.



Exceptional cutting edge sharpness in mild steel and SUS drilling
Newly designed linear cutting edge and special R THINNING enable improved chip evacuation and stable drilling.

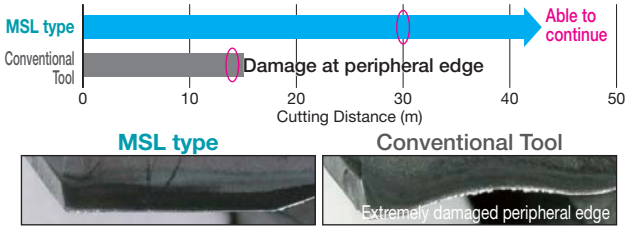
Stable long tool life
NX Coat based on ABSOTECH™ technology for improved fracture resistance and adhesion resistance.

Chip Evacuation



Equipment: Vertical Machining Centre BT50 Internal Coolant Supply 2MPa
Work Material: SS400 Tool: ø14 x 5D
Cutting Conditions: vc = 80m/min f = 0.2mm/rev H = 50mm

Longer Tool Life



Equipment: Vertical Machining Centre BT50 Internal Coolant Supply 2MPa
Work Material: SUS304 Tool: ø14 x 5D
Cutting Conditions: vc = 65m/min f = 0.15mm/rev H = 40mm

Recommended Cutting Conditions (MSL type/MTL type/MEL type)

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Work Material		Mild Steel (up to 250HB)	General Steel (250 to 320HB)		Hardened Steel (45HRC)	Stainless Steel (up to 200HB)	Gray Cast Iron	Ductile Cast Iron	Aluminum Alloy
Recommended Head		MSL type	MTL type	MSL type	MTL type	MSL type / MEL type	MTL type / MSL type	MTL type / MSL type	(Special Cutting Edge)*
Diameter DC (mm)	Cutting Conditions	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.
up to ø16.0	n	2,000 (1,400)	2,000 (1,400)	2,000 (1,400)	1,200 (1,000)	1,200 (1,000)	1,400 (1,200)	1,200 (1,000)	4,800 (4,000)
	vc	80-**100**-120 (50-**70**-80)	70-**100**-120 (50-**70**-80)	70-**100**-120 (50-**70**-80)	40-**60**-90 (30-**50**-70)	30-**50**-80 (30-**50**-60)	50-**70**-90 (40-**60**-80)	50-**60**-80 (40-**50**-70)	200-**240**-260 (180-**200**-240)
	f	0.15-**0.20**-0.25	0.15-**0.20**-0.30	0.10-**0.15**-0.20	0.10-**0.15**-0.20	0.10-**0.15**-0.20	0.20-**0.25**-0.30	0.20-**0.25**-0.30	0.35-**0.45**-0.55
Up to ø20.0	n	1,600 (1,100)	1,600 (1,100)	1,600 (1,100)	1,000 (800)	1,100 (950)	1,300 (1,100)	1,100 (950)	3,800 (3,200)
	vc	80-**100**-120 (50-**70**-80)	70-**100**-120 (50-**70**-80)	70-**100**-120 (50-**70**-80)	40-**60**-90 (30-**50**-70)	30-**60**-90 (30-**50**-70)	60-**80**-100 (50-**70**-90)	50-**70**-90 (40-**60**-80)	200-**240**-260 (180-**200**-240)
	f	0.15-**0.25**-0.30	0.20-**0.25**-0.35	0.15-**0.20**-0.25	0.15-**0.20**-0.25	0.10-**0.20**-0.25	0.20-**0.30**-0.35	0.20-**0.25**-0.35	0.35-**0.50**-0.60
Up to ø30.8	n	1,000 (700)	1,000 (700)	1,000 (700)	600 (500)	700 (600)	800 (700)	700 (600)	2,500 (2,000)
	vc	80-**100**-120 (50-**70**-80)	70-**100**-120 (50-**70**-80)	70-**100**-120 (50-**70**-80)	40-**60**-90 (30-**50**-70)	30-**60**-90 (30-**50**-70)	60-**80**-100 (50-**70**-90)	50-**70**-90 (40-**60**-80)	200-**240**-260 (180-**200**-240)
	f	0.20-**0.25**-0.30	0.20-**0.25**-0.35	0.15-**0.20**-0.25	0.15-**0.20**-0.25	0.10-**0.20**-0.25	0.20-**0.30**-0.40	0.25-**0.30**-0.35	0.35-**0.50**-0.60
Recommended Head		Large Diameter MTL type (ø31.0 up)							
ø31.0 to ø42.5	n	650 (520)	650 (520)		380 (300)	450 (300)	520 (450)	450 (380)	1,800 (1,500)
	vc	70-**90**-120 (50-**70**-80)	70-**90**-120 (50-**70**-80)		40-**50**-80 (30-**40**-60)	40-**60**-80 (30-**40**-60)	60-**70**-100 (50-**60**-90)	50-**60**-90 (40-**50**-70)	200-**240**-260 (180-**200**-240)
	f	0.25-**0.35**-0.45	0.25-**0.30**-0.40		0.15-**0.25**-0.30	0.20-**0.25**-0.30	0.25-**0.35**-0.45	0.25-**0.30**-0.35	0.35-**0.50**-0.60

Note: Adjustment of cutting feed f, etc., may be required depending on machine rigidity and workpiece rigidity.
For 8D and 12D drills, use the cutting speeds in parentheses as a guideline. Before drilling 8D and 12D holes, a guide hole of a similar diameter is recommended.
*The values in red above have been changed from the 2021-2022 General Catalogue.

* Inquire if you require special drill heads for aluminum alloy.

SMD series (Internal Coolant Supply)

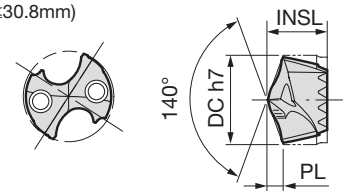
MTL | Carbon Steel/ Alloy Steel up to 0.25% | Carbon Steel/ Alloy Steel from 0.25% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron

DEX Coat | Indexable head MTL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h7

Indexable Head

Fig 1 (DC≤30.8mm)



Indexable Head MTL type Diameter ø12.0 to 17.3mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
12.0	●	SMDT 1200 MTL	9.1	2.2		1
12.1	●	1210 MTL	9.1	2.2		1
12.2	●	1220 MTL	9.1	2.2	SMDH120□	1
12.3	●	1230 MTL	9.1	2.2		1
12.4	●	1240 MTL	9.1	2.3		1
12.5	●	SMDT 1250 MTL	9.4	2.3		1
12.6	●	1260 MTL	9.4	2.3		1
12.7	●	1270 MTL	9.4	2.3	SMDH125□	1
12.8	●	1280 MTL	9.4	2.3		1
12.9	●	1290 MTL	9.4	2.3		1
13.0	●	SMDT 1300 MTL	9.7	2.4		1
13.1	●	1310 MTL	9.7	2.4		1
13.2	●	1320 MTL	9.7	2.4	SMDH130□	1
13.3	●	1330 MTL	9.7	2.4		1
13.4	●	1340 MTL	9.7	2.4		1
13.5	●	SMDT 1350 MTL	10.3	2.5		1
13.6	●	1360 MTL	10.3	2.5		1
13.7	●	1370 MTL	10.3	2.5		1
13.8	●	1380 MTL	10.3	2.5		1
13.9	●	1390 MTL	10.3	2.5		1
14.0	●	1400 MTL	10.3	2.5	SMDH140□	1
14.1	●	1410 MTL	10.3	2.6		1
14.2	●	1420 MTL	10.3	2.6		1
14.3	●	1430 MTL	10.3	2.6		1
14.4	●	1440 MTL	10.3	2.6		1
14.5	●	1450 MTL	10.3	2.6		1
14.6	●	SMDT 1460 MTL	11.0	2.7		1
14.7	●	1470 MTL	11.0	2.7		1
14.8	●	1480 MTL	11.0	2.7		1
14.9	●	1490 MTL	11.0	2.7		1
15.0	●	1500 MTL	11.0	2.7	SMDH150□	1
15.1	●	1510 MTL	11.0	2.7		1
15.2	●	1520 MTL	11.0	2.8		1
15.3	●	1530 MTL	11.0	2.8		1
15.4	●	1540 MTL	11.0	2.8		1
15.5	●	1550 MTL	11.0	2.8		1
15.6	●	SMDT 1560 MTL	11.6	2.8		1
15.7	●	1570 MTL	11.6	2.9		1
15.8	●	1580 MTL	11.6	2.9		1
15.9	●	1590 MTL	11.6	2.9		1
16.0	●	1600 MTL	11.6	2.9	SMDH160□	1
16.1	●	1610 MTL	11.6	2.9		1
16.2	●	1620 MTL	11.6	2.9		1
16.3	●	1630 MTL	11.6	3.0		1
16.4	●	1640 MTL	11.6	3.0		1
16.5	●	1650 MTL	11.6	3.0		1
16.6	●	SMDT 1660 MTL	12.2	3.0		1
16.7	●	1670 MTL	12.2	3.0		1
16.8	●	1680 MTL	12.2	3.1		1
16.9	●	1690 MTL	12.2	3.1		1
17.0	●	1700 MTL	12.2	3.1	SMDH170□	1
17.1	●	1710 MTL	12.2	3.1		1
17.2	●	1720 MTL	12.2	3.1		1
17.3	●	1730 MTL	12.2	3.1		1

Grades: ACX70 (Diameter DC: 12.0 to 30.8) ACX80 (Diameter DC: 30.9 to 42.5)

Recommended Cutting Conditions J105 | Applicable Holders J112

Indexable Head MTL type Diameter ø17.4 to 22.7mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
17.4	●	SMDT 1740 MTL	12.2	3.2	SMDH170□	1
17.5	●	1750 MTL	12.2	3.2		1
17.6	●	SMDT 1760 MTL	12.9	3.2		1
17.7	●	1770 MTL	12.9	3.2		1
17.8	●	1780 MTL	12.9	3.2		1
17.9	●	1790 MTL	12.9	3.3		1
18.0	●	1800 MTL	12.9	3.3		1
18.1	●	1810 MTL	12.9	3.3	SMDH180□	1
18.2	●	1820 MTL	12.9	3.3		1
18.3	●	1830 MTL	12.9	3.3		1
18.4	●	1840 MTL	12.9	3.3		1
18.5	●	1850 MTL	12.9	3.4		1
18.6	●	SMDT 1860 MTL	13.5	3.4		1
18.7	●	1870 MTL	13.5	3.4		1
18.8	●	1880 MTL	13.5	3.4		1
18.9	●	1890 MTL	13.5	3.4		1
19.0	●	1900 MTL	13.5	3.5		1
19.1	●	1910 MTL	13.5	3.5	SMDH190□	1
19.2	●	1920 MTL	13.5	3.5		1
19.3	●	1930 MTL	13.5	3.5		1
19.4	●	1940 MTL	13.5	3.5		1
19.5	●	1950 MTL	13.5	3.5		1
19.6	●	SMDT 1960 MTL	14.1	3.6		1
19.7	●	1970 MTL	14.1	3.6		1
19.8	●	1980 MTL	14.1	3.6		1
19.9	●	1990 MTL	14.1	3.6		1
20.0	●	2000 MTL	14.1	3.6	SMDH200□	1
20.1	●	2010 MTL	14.1	3.7		1
20.2	●	2020 MTL	14.1	3.7		1
20.3	●	2030 MTL	14.1	3.7		1
20.4	●	2040 MTL	14.1	3.7		1
20.5	●	2050 MTL	14.1	3.7		1
20.6	●	SMDT 2060 MTL	14.8	3.7		1
20.7	●	2070 MTL	14.8	3.8		1
20.8	●	2080 MTL	14.8	3.8		1
20.9	●	2090 MTL	14.8	3.8		1
21.0	●	2100 MTL	14.8	3.8		1
21.1	●	2110 MTL	14.8	3.8	SMDH210□	1
21.2	●	2120 MTL	14.8	3.9		1
21.3	●	2130 MTL	14.8	3.9		1
21.4	●	2140 MTL	14.8	3.9		1
21.5	●	2150 MTL	14.8	3.9		1
21.6	●	SMDT 2160 MTL	15.0	3.9		1
21.7	●	2170 MTL	15.0	3.9		1
21.8	●	2180 MTL	15.0	4.0		1
21.9	●	2190 MTL	15.0	4.0		1
22.0	●	2200 MTL	15.0	4.0		1
22.1	●	2210 MTL	15.0	4.0	SMDH220□	1
22.2	●	2220 MTL	15.0	4.0		1
22.3	●	2230 MTL	15.0	4.1		1
22.4	●	2240 MTL	15.0	4.1		1
22.5	●	2250 MTL	15.0	4.1		1
22.6	●	2260 MTL	15.0	4.1		1
22.7	●	2270 MTL	15.0	4.1		1

Grades: ACX70 (Diameter DC: 12.0 to 30.8) ACX80 (Diameter DC: 30.9 to 42.5)

Recommended Cutting Conditions J105 | Applicable Holders J112

SMD series (Internal Coolant Supply)

MTL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron

DEX Coat | Indexable head MTL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h7

Indexable Head

Fig 1 (DC≤30.8mm)

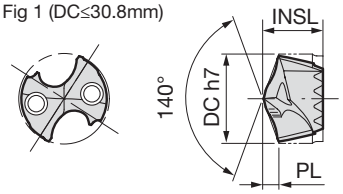
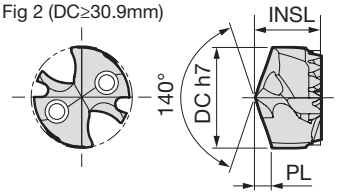


Fig 2 (DC≥30.9mm)



Indexable Head MTL type Diameter ø22.8 to 28.1mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
22.8	●	SMDT 2280 MTL	15.0	4.1	SMDH220□	1
22.9	●	SMDT 2290 MTL	15.1	4.2		1
23.0	●	2300 MTL	15.1	4.2		1
23.1	●	2310 MTL	15.1	4.2		1
23.2	●	2320 MTL	15.1	4.2		1
23.3	●	2330 MTL	15.1	4.2	SMDH230□	1
23.4	●	2340 MTL	15.1	4.3		1
23.5	●	2350 MTL	15.1	4.3		1
23.6	●	2360 MTL	15.1	4.3		1
23.7	●	2370 MTL	15.1	4.3		1
23.8	●	2380 MTL	15.1	4.3		1
23.9	●	SMDT 2390 MTL	15.4	4.3		1
24.0	●	2400 MTL	15.4	4.4		1
24.1	●	2410 MTL	15.4	4.4		1
24.2	●	2420 MTL	15.4	4.4		1
24.3	●	2430 MTL	15.4	4.4	SMDH240□	1
24.4	●	2440 MTL	15.4	4.4		1
24.5	●	2450 MTL	15.4	4.5		1
24.6	●	2460 MTL	15.4	4.5		1
24.7	●	2470 MTL	15.4	4.5		1
24.8	●	2480 MTL	15.4	4.5		1
24.9	●	SMDT 2490 MTL	15.8	4.5		1
25.0	●	2500 MTL	15.8	4.5		1
25.1	●	2510 MTL	15.8	4.6		1
25.2	●	2520 MTL	15.8	4.6		1
25.3	●	2530 MTL	15.8	4.6	SMDH250□	1
25.4	●	2540 MTL	15.8	4.6		1
25.5	●	2550 MTL	15.8	4.6		1
25.6	●	2560 MTL	15.8	4.7		1
25.7	●	2570 MTL	15.8	4.7		1
25.8	●	2580 MTL	15.8	4.7		1
25.9	●	SMDT 2590 MTL	16.4	4.7		1
26.0	●	2600 MTL	16.4	4.7		1
26.1	●	2610 MTL	16.4	4.7		1
26.2	●	2620 MTL	16.4	4.8		1
26.3	●	2630 MTL	16.4	4.8	SMDH260□	1
26.4	●	2640 MTL	16.4	4.8		1
26.5	●	2650 MTL	16.4	4.8		1
26.6	●	2660 MTL	16.4	4.8		1
26.7	●	2670 MTL	16.4	4.9		1
26.8	●	2680 MTL	16.4	4.9		1
26.9	●	SMDT 2690 MTL	17.1	4.9		1
27.0	●	2700 MTL	17.1	4.9		1
27.1	●	2710 MTL	17.1	4.9		1
27.2	●	2720 MTL	17.1	4.9		1
27.3	●	2730 MTL	17.1	5.0	SMDH270□	1
27.4	●	2740 MTL	17.1	5.0		1
27.5	●	2750 MTL	17.1	5.0		1
27.6	●	2760 MTL	17.1	5.0		1
27.7	●	2770 MTL	17.1	5.0		1
27.8	●	2780 MTL	17.1	5.1		1
27.9	●	SMDT 2790 MTL	17.7	5.1		1
28.0	●	2800 MTL	17.7	5.1	SMDH280□	1
28.1	●	2810 MTL	17.7	5.1		1

Grades: ACX70 (Diameter DC: 12.0 to 30.8) ACX80 (Diameter DC: 30.9 to 42.5)

Recommended Cutting Conditions J105 | Applicable Holders J112

Indexable Head MTL type Diameter ø28.2 to 42.5mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
28.2	●	SMDT 2820 MTL	17.7	5.1		1
28.3	●	2830 MTL	17.7	5.2		1
28.4	●	2840 MTL	17.7	5.2		1
28.5	●	2850 MTL	17.7	5.2	SMDH280□	1
28.6	●	2860 MTL	17.7	5.2		1
28.7	●	2870 MTL	17.7	5.2		1
28.8	●	2880 MTL	17.7	5.2		1
28.9	●	SMDT 2890 MTL	18.3	5.3		1
29.0	●	2900 MTL	18.3	5.3		1
29.1	●	2910 MTL	18.3	5.3		1
29.2	●	2920 MTL	18.3	5.3		1
29.3	●	2930 MTL	18.3	5.3	SMDH290□	1
29.4	●	2940 MTL	18.3	5.4		1
29.5	●	2950 MTL	18.3	5.4		1
29.6	●	2960 MTL	18.3	5.4		1
29.7	●	2970 MTL	18.3	5.4		1
29.8	●	2980 MTL	18.3	5.4		1
29.9	●	SMDT 2990 MTL	19.0	5.4		1
30.0	●	3000 MTL	19.0	5.5		1
30.1	●	3010 MTL	19.0	5.5		1
30.2	●	3020 MTL	19.0	5.5		1
30.3	●	3030 MTL	19.0	5.5	SMDH300□	1
30.4	●	3040 MTL	19.0	5.5		1
30.5	●	3050 MTL	19.0	5.6		1
30.6	●	3060 MTL	19.0	5.6		1
30.7	●	3070 MTL	19.0	5.6		1
30.8	●	3080 MTL	19.0	5.6		1
31.0	●	SMDT 3100 MTL	21.0	5.6		2
31.5		3150 MTL	21.0	5.7	SMDH320□	2
32.0	●	3200 MTL	21.0	5.8		2
32.5		SMDT 3250 MTL	21.0	5.9		2
33.0	●	3300 MTL	21.0	6.0	SMDH335□	2
33.5		3350 MTL	21.0	6.1		2
34.0	●	SMDT 3400 MTL	23.0	6.2		2
34.5		3450 MTL	23.0	6.3	SMDH350□	2
35.0	●	3500 MTL	23.0	6.4		2
35.5		SMDT 3550 MTL	23.0	6.5		2
36.0	●	3600 MTL	23.0	6.6	SMDH365□	2
36.5		3650 MTL	23.0	6.6		2
37.0	●	SMDT 3700 MTL	25.0	6.7		2
37.5	●	3750 MTL	25.0	6.8	SMDH380□	2
38.0	●	3800 MTL	25.0	6.9		2
38.5		SMDT 3850 MTL	25.0	7.0		2
39.0	●	3900 MTL	25.0	7.1	SMDH395□	2
39.5		3950 MTL	25.0	7.2		2
40.0	●	SMDT 4000 MTL	27.0	7.3		2
40.5	●	4050 MTL	27.0	7.4	SMDH410□	2
41.0	●	4100 MTL	27.0	7.5		2
41.5		SMDT 4150 MTL	27.0	7.6		2
42.0	●	4200 MTL	27.0	7.6	SMDH425□	2
42.5		4250 MTL	27.0	7.7		2

Grades: ACX70 (Diameter DC: 12.0 to 30.8) ACX80 (Diameter DC: 30.9 to 42.5)

Recommended Cutting Conditions J105 | Applicable Holders J112, J113

SMD series (Internal Coolant Supply)

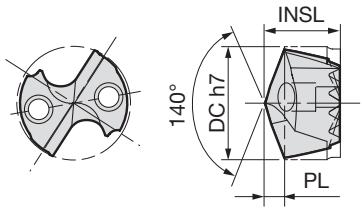
MSL | Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

NX Coat | Indexable head MSL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h7

Indexable Head

Fig 1



Indexable Head MSL type Diameter ø12.0 to 17.3mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
12.0	●	SMDT 1200 MSL	9.1	2.2		1
12.1	●	1210 MSL	9.1	2.2		1
12.2	●	1220 MSL	9.1	2.2	SMDH120□	1
12.3	●	1230 MSL	9.1	2.2		1
12.4	●	1240 MSL	9.1	2.3		1
12.5	●	SMDT 1250 MSL	9.4	2.3		1
12.6	●	1260 MSL	9.4	2.3		1
12.7	●	1270 MSL	9.4	2.3	SMDH125□	1
12.8	●	1280 MSL	9.4	2.3		1
12.9	●	1290 MSL	9.4	2.3		1
13.0	●	SMDT 1300 MSL	9.7	2.4		1
13.1	●	1310 MSL	9.7	2.4		1
13.2	●	1320 MSL	9.7	2.4	SMDH130□	1
13.3	●	1330 MSL	9.7	2.4		1
13.4	●	1340 MSL	9.7	2.4		1
13.5	●	SMDT 1350 MSL	10.3	2.5		1
13.6	●	1360 MSL	10.3	2.5		1
13.7	●	1370 MSL	10.3	2.5		1
13.8	●	1380 MSL	10.3	2.5		1
13.9	●	1390 MSL	10.3	2.5		1
14.0	●	1400 MSL	10.3	2.5	SMDH140□	1
14.1	●	1410 MSL	10.3	2.6		1
14.2	●	1420 MSL	10.3	2.6		1
14.3	●	1430 MSL	10.3	2.6		1
14.4	●	1440 MSL	10.3	2.6		1
14.5	●	1450 MSL	10.3	2.6		1
14.6	●	SMDT 1460 MSL	11.0	2.7		1
14.7	●	1470 MSL	11.0	2.7		1
14.8	●	1480 MSL	11.0	2.7		1
14.9	●	1490 MSL	11.0	2.7		1
15.0	●	1500 MSL	11.0	2.7	SMDH150□	1
15.1	●	1510 MSL	11.0	2.7		1
15.2	●	1520 MSL	11.0	2.8		1
15.3	●	1530 MSL	11.0	2.8		1
15.4	●	1540 MSL	11.0	2.8		1
15.5	●	1550 MSL	11.0	2.8		1
15.6	●	SMDT 1560 MSL	11.6	2.8		1
15.7	●	1570 MSL	11.6	2.9		1
15.8	●	1580 MSL	11.6	2.9		1
15.9	●	1590 MSL	11.6	2.9		1
16.0	●	1600 MSL	11.6	2.9	SMDH160□	1
16.1	●	1610 MSL	11.6	2.9		1
16.2	●	1620 MSL	11.6	2.9		1
16.3	●	1630 MSL	11.6	3.0		1
16.4	●	1640 MSL	11.6	3.0		1
16.5	●	1650 MSL	11.6	3.0		1
16.6	●	SMDT 1660 MSL	12.2	3.0		1
16.7	●	1670 MSL	12.2	3.0		1
16.8	●	1680 MSL	12.2	3.1		1
16.9	●	1690 MSL	12.2	3.1		1
17.0	●	1700 MSL	12.2	3.1	SMDH170□	1
17.1	●	1710 MSL	12.2	3.1		1
17.2	●	1720 MSL	12.2	3.1		1
17.3	●	1730 MSL	12.2	3.1		1

Grade: ACT100

Recommended Cutting Conditions ☞ J105 Applicable Holders ☞ J112

Indexable Head MSL type Diameter ø17.4 to 22.7mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
17.4	●	SMDT 1740 MSL	12.2	3.2	SMDH170□	1
17.5	●	1750 MSL	12.2	3.2		1
17.6	●	SMDT 1760 MSL	12.9	3.2		1
17.7	●	1770 MSL	12.9	3.2		1
17.8	●	1780 MSL	12.9	3.2		1
17.9	●	1790 MSL	12.9	3.3		1
18.0	●	1800 MSL	12.9	3.3		1
18.1	●	1810 MSL	12.9	3.3	SMDH180□	1
18.2	●	1820 MSL	12.9	3.3		1
18.3	●	1830 MSL	12.9	3.3		1
18.4	●	1840 MSL	12.9	3.3		1
18.5	●	1850 MSL	12.9	3.4		1
18.6	●	SMDT 1860 MSL	13.5	3.4		1
18.7	●	1870 MSL	13.5	3.4		1
18.8	●	1880 MSL	13.5	3.4		1
18.9	●	1890 MSL	13.5	3.4		1
19.0	●	1900 MSL	13.5	3.5		1
19.1	●	1910 MSL	13.5	3.5	SMDH190□	1
19.2	●	1920 MSL	13.5	3.5		1
19.3	●	1930 MSL	13.5	3.5		1
19.4	●	1940 MSL	13.5	3.5		1
19.5	●	1950 MSL	13.5	3.5		1
19.6	●	SMDT 1960 MSL	14.1	3.6		1
19.7	●	1970 MSL	14.1	3.6		1
19.8	●	1980 MSL	14.1	3.6		1
19.9	●	1990 MSL	14.1	3.6		1
20.0	●	2000 MSL	14.1	3.6	SMDH200□	1
20.1	●	2010 MSL	14.1	3.7		1
20.2	●	2020 MSL	14.1	3.7		1
20.3	●	2030 MSL	14.1	3.7		1
20.4	●	2040 MSL	14.1	3.7		1
20.5	●	2050 MSL	14.1	3.7		1
20.6	●	SMDT 2060 MSL	14.8	3.7		1
20.7	●	2070 MSL	14.8	3.8		1
20.8	●	2080 MSL	14.8	3.8		1
20.9	●	2090 MSL	14.8	3.8		1
21.0	●	2100 MSL	14.8	3.8		1
21.1	●	2110 MSL	14.8	3.8	SMDH210□	1
21.2	●	2120 MSL	14.8	3.9		1
21.3	●	2130 MSL	14.8	3.9		1
21.4	●	2140 MSL	14.8	3.9		1
21.5	●	2150 MSL	14.8	3.9		1
21.6	●	SMDT 2160 MSL	15.0	3.9		1
21.7	●	2170 MSL	15.0	3.9		1
21.8	●	2180 MSL	15.0	4.0		1
21.9	●	2190 MSL	15.0	4.0		1
22.0	●	2200 MSL	15.0	4.0		1
22.1	●	2210 MSL	15.0	4.0	SMDH220□	1
22.2	●	2220 MSL	15.0	4.0		1
22.3	●	2230 MSL	15.0	4.1		1
22.4	●	2240 MSL	15.0	4.1		1
22.5	●	2250 MSL	15.0	4.1		1
22.6	●	2260 MSL	15.0	4.1		1
22.7	●	2270 MSL	15.0	4.1		1

Grade: ACT100

Recommended Cutting Conditions ☞ J105 Applicable Holders ☞ J112

SMD series (Internal Coolant Supply)

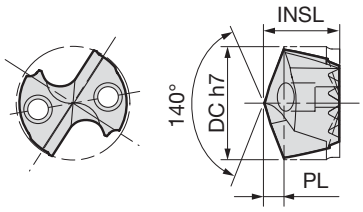
MSL | Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

NX Coat | Indexable head MSL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h7

Indexable Head

Fig 1



Indexable Head MSL type Diameter ø22.8 to 28.1mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
22.8	●	SMDT 2280 MSL	15.0	4.1	SMDH220□	1
22.9	●	SMDT 2290 MSL	15.1	4.2	SMDH230□	1
23.0	●	2300 MSL	15.1	4.2		1
23.1	●	2310 MSL	15.1	4.2		1
23.2	●	2320 MSL	15.1	4.2		1
23.3	●	2330 MSL	15.1	4.2		1
23.4	●	2340 MSL	15.1	4.3		1
23.5	●	2350 MSL	15.1	4.3		1
23.6	●	2360 MSL	15.1	4.3		1
23.7	●	2370 MSL	15.1	4.3		1
23.8	●	2380 MSL	15.1	4.3		1
23.9	●	SMDT 2390 MSL	15.4	4.3	SMDH240□	1
24.0	●	2400 MSL	15.4	4.4		1
24.1	●	2410 MSL	15.4	4.4		1
24.2	●	2420 MSL	15.4	4.4		1
24.3	●	2430 MSL	15.4	4.4		1
24.4	●	2440 MSL	15.4	4.4		1
24.5	●	2450 MSL	15.4	4.5		1
24.6	●	2460 MSL	15.4	4.5		1
24.7	●	2470 MSL	15.4	4.5		1
24.8	●	2480 MSL	15.4	4.5		1
24.9	●	SMDT 2490 MSL	15.8	4.5	SMDH250□	1
25.0	●	2500 MSL	15.8	4.5		1
25.1	●	2510 MSL	15.8	4.6		1
25.2	●	2520 MSL	15.8	4.6		1
25.3	●	2530 MSL	15.8	4.6		1
25.4	●	2540 MSL	15.8	4.6		1
25.5	●	2550 MSL	15.8	4.6		1
25.6	●	2560 MSL	15.8	4.7		1
25.7	●	2570 MSL	15.8	4.7		1
25.8	●	2580 MSL	15.8	4.7		1
25.9	●	SMDT 2590 MSL	16.4	4.7	SMDH260□	1
26.0	●	2600 MSL	16.4	4.7		1
26.1	●	2610 MSL	16.4	4.7		1
26.2	●	2620 MSL	16.4	4.8		1
26.3	●	2630 MSL	16.4	4.8		1
26.4	●	2640 MSL	16.4	4.8		1
26.5	●	2650 MSL	16.4	4.8		1
26.6	●	2660 MSL	16.4	4.8		1
26.7	●	2670 MSL	16.4	4.9		1
26.8	●	2680 MSL	16.4	4.9		1
26.9	●	SMDT 2690 MSL	17.1	4.9	SMDH270□	1
27.0	●	2700 MSL	17.1	4.9		1
27.1	●	2710 MSL	17.1	4.9		1
27.2	●	2720 MSL	17.1	4.9		1
27.3	●	2730 MSL	17.1	5.0		1
27.4	●	2740 MSL	17.1	5.0		1
27.5	●	2750 MSL	17.1	5.0		1
27.6	●	2760 MSL	17.1	5.0		1
27.7	●	2770 MSL	17.1	5.0		1
27.8	●	2780 MSL	17.1	5.1		1
27.9	●	SMDT 2790 MSL	17.7	5.1	SMDH280□	1
28.0	●	2800 MSL	17.7	5.1		1
28.1	●	2810 MSL	17.7	5.1		1

Grade: ACT100

Recommended Cutting Conditions ☞ J105 Applicable Holders ☞ J112

Indexable Head MSL type Diameter ø28.2 to 30.8mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
28.2	●	SMDT 2820 MSL	17.7	5.1	SMDH280□	1
28.3	●	2830 MSL	17.7	5.2		1
28.4	●	2840 MSL	17.7	5.2		1
28.5	●	2850 MSL	17.7	5.2		1
28.6	●	2860 MSL	17.7	5.2		1
28.7	●	2870 MSL	17.7	5.2		1
28.8	●	2880 MSL	17.7	5.2		1
28.9	●	SMDT 2890 MSL	18.3	5.3	SMDH290□	1
29.0	●	2900 MSL	18.3	5.3		1
29.1	●	2910 MSL	18.3	5.3		1
29.2	●	2920 MSL	18.3	5.3		1
29.3	●	2930 MSL	18.3	5.3		1
29.4	●	2940 MSL	18.3	5.4		1
29.5	●	2950 MSL	18.3	5.4		1
29.6	●	2960 MSL	18.3	5.4		1
29.7	●	2970 MSL	18.3	5.4		1
29.8	●	2980 MSL	18.3	5.4		1
29.9	●	SMDT 2990 MSL	19.0	5.4	SMDH300□	1
30.0	●	3000 MSL	19.0	5.5		1
30.1	●	3010 MSL	19.0	5.5		1
30.2	●	3020 MSL	19.0	5.5		1
30.3	●	3030 MSL	19.0	5.5		1
30.4	●	3040 MSL	19.0	5.5		1
30.5	●	3050 MSL	19.0	5.6		1
30.6	●	3060 MSL	19.0	5.6		1
30.7	●	3070 MSL	19.0	5.6		1
30.8	●	3080 MSL	19.0	5.6		1

Grade: ACT100

Recommended Cutting Conditions ☞ J105 Applicable Holders ☞ J112, J113

SMD series (Internal Coolant Supply)

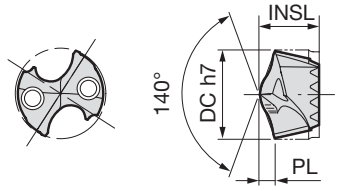
MEL | Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MEL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h7

Indexable Head

Fig 1



Indexable Head MEL type Diameter ø12.0 to 17.3mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
12.0	▲	SMDT 1200 MEL	9.1	2.2		1
12.1	▲	1210 MEL	9.1	2.2		1
12.2	▲	1220 MEL	9.1	2.2	SMDH120□	1
12.3	▲	1230 MEL	9.1	2.2		1
12.4	▲	1240 MEL	9.1	2.3		1
12.5	▲	SMDT 1250 MEL	9.4	2.3		1
12.6	▲	1260 MEL	9.4	2.3		1
12.7	▲	1270 MEL	9.4	2.3	SMDH125□	1
12.8	▲	1280 MEL	9.4	2.3		1
12.9	▲	1290 MEL	9.4	2.3		1
13.0	▲	SMDT 1300 MEL	9.7	2.4		1
13.1	▲	1310 MEL	9.7	2.4		1
13.2	▲	1320 MEL	9.7	2.4	SMDH130□	1
13.3	▲	1330 MEL	9.7	2.4		1
13.4	▲	1340 MEL	9.7	2.4		1
13.5	▲	SMDT 1350 MEL	10.3	2.5		1
13.6	▲	1360 MEL	10.3	2.5		1
13.7	▲	1370 MEL	10.3	2.5		1
13.8	▲	1380 MEL	10.3	2.5		1
13.9	▲	1390 MEL	10.3	2.5		1
14.0	▲	1400 MEL	10.3	2.5	SMDH140□	1
14.1	▲	1410 MEL	10.3	2.6		1
14.2	▲	1420 MEL	10.3	2.6		1
14.3	▲	1430 MEL	10.3	2.6		1
14.4	▲	1440 MEL	10.3	2.6		1
14.5	▲	1450 MEL	10.3	2.6		1
14.6	▲	SMDT 1460 MEL	11.0	2.7		1
14.7	▲	1470 MEL	11.0	2.7		1
14.8	▲	1480 MEL	11.0	2.7		1
14.9	▲	1490 MEL	11.0	2.7		1
15.0	▲	1500 MEL	11.0	2.7	SMDH150□	1
15.1	▲	1510 MEL	11.0	2.7		1
15.2	▲	1520 MEL	11.0	2.8		1
15.3	▲	1530 MEL	11.0	2.8		1
15.4	▲	1540 MEL	11.0	2.8		1
15.5	▲	1550 MEL	11.0	2.8		1
15.6	▲	SMDT 1560 MEL	11.6	2.8		1
15.7	▲	1570 MEL	11.6	2.9		1
15.8	▲	1580 MEL	11.6	2.9		1
15.9	▲	1590 MEL	11.6	2.9		1
16.0	▲	1600 MEL	11.6	2.9	SMDH160□	1
16.1	▲	1610 MEL	11.6	2.9		1
16.2	▲	1620 MEL	11.6	2.9		1
16.3	▲	1630 MEL	11.6	3.0		1
16.4	▲	1640 MEL	11.6	3.0		1
16.5	▲	1650 MEL	11.6	3.0		1
16.6	▲	SMDT 1660 MEL	12.2	3.0		1
16.7	▲	1670 MEL	12.2	3.0		1
16.8	▲	1680 MEL	12.2	3.1		1
16.9	▲	1690 MEL	12.2	3.1		1
17.0	▲	1700 MEL	12.2	3.1	SMDH170□	1
17.1	▲	1710 MEL	12.2	3.1		1
17.2	▲	1720 MEL	12.2	3.1		1
17.3	▲	1730 MEL	12.2	3.1		1

Grade: ACX80

Recommended Cutting Conditions J105 | Applicable Holders J112

Indexable Head MEL type Diameter ø17.4 to 22.7mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
17.4	▲	SMDT 1740 MEL	12.2	3.2	SMDH170□	1
17.5	▲	1750 MEL	12.2	3.2		1
17.6	▲	SMDT 1760 MEL	12.9	3.2		1
17.7	▲	1770 MEL	12.9	3.2		1
17.8	▲	1780 MEL	12.9	3.2		1
17.9	▲	1790 MEL	12.9	3.3		1
18.0	▲	1800 MEL	12.9	3.3		1
18.1	▲	1810 MEL	12.9	3.3	SMDH180□	1
18.2	▲	1820 MEL	12.9	3.3		1
18.3	▲	1830 MEL	12.9	3.3		1
18.4	▲	1840 MEL	12.9	3.3		1
18.5	▲	1850 MEL	12.9	3.4		1
18.6	▲	SMDT 1860 MEL	13.5	3.4		1
18.7	▲	1870 MEL	13.5	3.4		1
18.8	▲	1880 MEL	13.5	3.4		1
18.9	▲	1890 MEL	13.5	3.4		1
19.0	▲	1900 MEL	13.5	3.5		1
19.1	▲	1910 MEL	13.5	3.5	SMDH190□	1
19.2	▲	1920 MEL	13.5	3.5		1
19.3	▲	1930 MEL	13.5	3.5		1
19.4	▲	1940 MEL	13.5	3.5		1
19.5	▲	1950 MEL	13.5	3.5		1
19.6	▲	SMDT 1960 MEL	14.1	3.6		1
19.7	▲	1970 MEL	14.1	3.6		1
19.8	▲	1980 MEL	14.1	3.6		1
19.9	▲	1990 MEL	14.1	3.6		1
20.0	▲	2000 MEL	14.1	3.6		1
20.1	▲	2010 MEL	14.1	3.7	SMDH200□	1
20.2	▲	2020 MEL	14.1	3.7		1
20.3	▲	2030 MEL	14.1	3.7		1
20.4	▲	2040 MEL	14.1	3.7		1
20.5	▲	2050 MEL	14.1	3.7		1
20.6	▲	SMDT 2060 MEL	14.8	3.7		1
20.7	▲	2070 MEL	14.8	3.8		1
20.8	▲	2080 MEL	14.8	3.8		1
20.9	▲	2090 MEL	14.8	3.8		1
21.0	▲	2100 MEL	14.8	3.8		1
21.1	▲	2110 MEL	14.8	3.8	SMDH210□	1
21.2	▲	2120 MEL	14.8	3.9		1
21.3	▲	2130 MEL	14.8	3.9		1
21.4	▲	2140 MEL	14.8	3.9		1
21.5	▲	2150 MEL	14.8	3.9		1
21.6	▲	SMDT 2160 MEL	15.0	3.9		1
21.7	▲	2170 MEL	15.0	3.9		1
21.8	▲	2180 MEL	15.0	4.0		1
21.9	▲	2190 MEL	15.0	4.0		1
22.0	▲	2200 MEL	15.0	4.0		1
22.1	▲	2210 MEL	15.0	4.0	SMDH220□	1
22.2	▲	2220 MEL	15.0	4.0		1
22.3	▲	2230 MEL	15.0	4.1		1
22.4	▲	2240 MEL	15.0	4.1		1
22.5	▲	2250 MEL	15.0	4.1		1
22.6	▲	2260 MEL	15.0	4.1		1
22.7	▲	2270 MEL	15.0	4.1		1

Grade: ACX80

Recommended Cutting Conditions J105 | Applicable Holders J112

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SMD series (Internal Coolant Supply) MEL

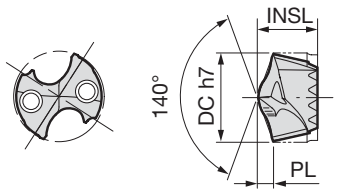
Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MEL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h7

Indexable Head

Fig 1



Indexable Head MEL type Diameter ø22.8 to 28.1mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
22.8	▲	SMDT 2280 MEL	15.0	4.1	SMDH220□	1
22.9	▲	SMDT 2290 MEL	15.1	4.2	SMDH230□	1
23.0	▲	2300 MEL	15.1	4.2		1
23.1	▲	2310 MEL	15.1	4.2		1
23.2	▲	2320 MEL	15.1	4.2		1
23.3	▲	2330 MEL	15.1	4.2		1
23.4	▲	2340 MEL	15.1	4.3		1
23.5	▲	2350 MEL	15.1	4.3		1
23.6	▲	2360 MEL	15.1	4.3		1
23.7	▲	2370 MEL	15.1	4.3		1
23.8	▲	2380 MEL	15.1	4.3		1
23.9	▲	SMDT 2390 MEL	15.4	4.3	SMDH240□	1
24.0	▲	2400 MEL	15.4	4.4		1
24.1	▲	2410 MEL	15.4	4.4		1
24.2	▲	2420 MEL	15.4	4.4		1
24.3	▲	2430 MEL	15.4	4.4		1
24.4	▲	2440 MEL	15.4	4.4		1
24.5	▲	2450 MEL	15.4	4.5		1
24.6	▲	2460 MEL	15.4	4.5		1
24.7	▲	2470 MEL	15.4	4.5		1
24.8	▲	2480 MEL	15.4	4.5		1
24.9	▲	SMDT 2490 MEL	15.8	4.5	SMDH250□	1
25.0	▲	2500 MEL	15.8	4.5		1
25.1	▲	2510 MEL	15.8	4.6		1
25.2	▲	2520 MEL	15.8	4.6		1
25.3	▲	2530 MEL	15.8	4.6		1
25.4	▲	2540 MEL	15.8	4.6		1
25.5	▲	2550 MEL	15.8	4.6		1
25.6	▲	2560 MEL	15.8	4.7		1
25.7	▲	2570 MEL	15.8	4.7		1
25.8	▲	2580 MEL	15.8	4.7		1
25.9	▲	SMDT 2590 MEL	16.4	4.7	SMDH260□	1
26.0	▲	2600 MEL	16.4	4.7		1
26.1	▲	2610 MEL	16.4	4.7		1
26.2	▲	2620 MEL	16.4	4.8		1
26.3	▲	2630 MEL	16.4	4.8		1
26.4	▲	2640 MEL	16.4	4.8		1
26.5	▲	2650 MEL	16.4	4.8		1
26.6	▲	2660 MEL	16.4	4.8		1
26.7	▲	2670 MEL	16.4	4.9		1
26.8	▲	2680 MEL	16.4	4.9		1
26.9	▲	SMDT 2690 MEL	17.1	4.9	SMDH270□	1
27.0	▲	2700 MEL	17.1	4.9		1
27.1	▲	2710 MEL	17.1	4.9		1
27.2	▲	2720 MEL	17.1	4.9		1
27.3	▲	2730 MEL	17.1	5.0		1
27.4	▲	2740 MEL	17.1	5.0		1
27.5	▲	2750 MEL	17.1	5.0		1
27.6	▲	2760 MEL	17.1	5.0		1
27.7	▲	2770 MEL	17.1	5.0		1
27.8	▲	2780 MEL	17.1	5.1		1
27.9	▲	SMDT 2790 MEL	17.7	5.1	SMDH280□	1
28.0	▲	2800 MEL	17.7	5.1		1
28.1	▲	2810 MEL	17.7	5.1		1

Grade: ACX80

Recommended Cutting Conditions J105 | Applicable Holders J112

Indexable Head MEL type Diameter ø28.2 to 30.8mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
28.2	▲	SMDT 2820 MEL	17.7	5.1	SMDH280□	1
28.3	▲	2830 MEL	17.7	5.2		1
28.4	▲	2840 MEL	17.7	5.2		1
28.5	▲	2850 MEL	17.7	5.2		1
28.6	▲	2860 MEL	17.7	5.2		1
28.7	▲	2870 MEL	17.7	5.2		1
28.8	▲	2880 MEL	17.7	5.2		1
28.9	▲	SMDT 2890 MEL	18.3	5.3	SMDH290□	1
29.0	▲	2900 MEL	18.3	5.3		1
29.1	▲	2910 MEL	18.3	5.3		1
29.2	▲	2920 MEL	18.3	5.3		1
29.3	▲	2930 MEL	18.3	5.3		1
29.4	▲	2940 MEL	18.3	5.4		1
29.5	▲	2950 MEL	18.3	5.4		1
29.6	▲	2960 MEL	18.3	5.4		1
29.7	▲	2970 MEL	18.3	5.4		1
29.8	▲	2980 MEL	18.3	5.4		1
29.9	▲	SMDT 2990 MEL	19.0	5.4	SMDH300□	1
30.0	▲	3000 MEL	19.0	5.5		1
30.1	▲	3010 MEL	19.0	5.5		1
30.2	▲	3020 MEL	19.0	5.5		1
30.3	▲	3030 MEL	19.0	5.5		1
30.4	▲	3040 MEL	19.0	5.5		1
30.5	▲	3050 MEL	19.0	5.6		1
30.6	▲	3060 MEL	19.0	5.6		1
30.7	▲	3070 MEL	19.0	5.6		1
30.8	▲	3080 MEL	19.0	5.6		1

Grade: ACX80

Recommended Cutting Conditions J105 | Applicable Holders J112, J113

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SMD series (Internal Coolant Supply) Side Lock Flat/No Flange

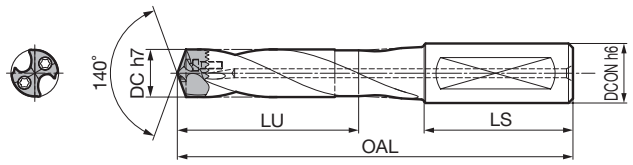
MTL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron
MSL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy
MEL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | NX Coat | Indexable head MTL | Indexable head MSL | Indexable head MEL | Coolant Hole | Indexable | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø12.0 to 29.8mm with MTL type/MSL type/MEL type set Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	N·m	Wrench
12.0 ≤ D < 12.5	3	SMDH 120M	●	42.0	107.2	48	16	MTL/MSL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	120L	●	67.0	132.2	48	16	MEL	1			
12.5 ≤ D < 13.0	3	SMDH 125M	●	44.0	107.3	48	16	MTL/MSL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	125L	●	69.0	132.3	48	16	MEL	1			
13.0 ≤ D < 13.5	3	SMDH 130M	●	45.0	112.4	48	16	MTL/MSL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	130L	●	72.0	142.4	48	16	MEL	1			
13.5 ≤ D ≤ 14.5	3	SMDH 140M	●	51.0	119.0	48	16	MTL/MSL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	140L	●	80.0	149.0	48	16	MEL	1			
	8	140D	●	123.0	194.0	48	16		1			
14.5 < D ≤ 15.5	3	SMDH 150M	●	54.0	129.2	50	20	MTL/MSL	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	150L	●	85.0	159.2	50	20	MEL	1			
	8	150D	●	131.0	204.2	50	20		1			
15.5 < D ≤ 16.5	3	SMDH 160M	●	57.0	134.4	50	20	MTL/MSL	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	160L	●	90.0	169.4	50	20	MEL	1			
	8	160D	●	140.0	214.4	50	20		1			
16.5 < D ≤ 17.5	3	SMDH 170M	●	60.0	139.6	50	20	MTL/MSL	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	170L	●	95.0	174.6	50	20	MEL	1			
	8	170D	●	148.0	224.6	50	20		1			
17.5 < D ≤ 18.5	3	SMDH 180M	●	63.0	144.8	50	20	MTL/MSL	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	180L	●	100.0	179.8	50	20	MEL	1			
	8	180D	●	156.0	229.8	50	20		1			
18.5 < D ≤ 19.5	3	SMDH 190M	●	67.0	160.0	56	25	MTL/MSL	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	190L	●	106.0	195.0	56	25	MEL	1			
	8	190D	●	164.0	255.0	56	25		1			
19.5 < D ≤ 20.5	3	SMDH 200M	●	70.0	160.1	56	25	MTL/MSL	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	200L	●	111.0	200.1	56	25	MEL	1			
	8	200D	●	172.0	265.1	56	25		1			
20.5 < D ≤ 21.5	3	SMDH 210M	●	73.0	160.3	56	25	MTL/MSL	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	210L	●	116.0	200.3	56	25	MEL	1			
	8	210D	●	180.0	270.3	56	25		1			
21.5 < D ≤ 22.8	3	SMDH 220M	●	77.0	165.1	56	25	MTL/MSL	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	220L	●	123.0	205.1	56	25	MEL	1			
	8	220D	●	191.0	275.1	56	25		1			
22.8 < D ≤ 23.8	3	SMDH 230M	●	80.0	164.7	56	25	MTL/MSL	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	230L	●	128.0	214.7	56	25	MEL	1			
	8	230D	●	199.0	284.7	56	25		1			
23.8 < D ≤ 24.8	3	SMDH 240M	●	83.0	174.6	60	32	MTL/MSL	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	240L	●	133.0	224.6	60	32	MEL	1			
	8	240D	●	207.0	299.6	60	32		1			
24.8 < D ≤ 25.8	3	SMDH 250M	●	87.0	174.5	60	32	MTL/MSL	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	250L	●	138.0	229.5	60	32	MEL	1			
	8	250D	●	216.0	304.5	60	32		1			
25.8 < D ≤ 26.8	3	SMDH 260M	●	90.0	179.7	60	32	MTL/MSL	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	260L	●	143.0	234.7	60	32	MEL	1			
	8	260D	●	224.0	314.7	60	32		1			
26.8 < D ≤ 27.8	3	SMDH 270M	●	93.0	179.9	60	32	MTL/MSL	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	270L	●	149.0	239.9	60	32	MEL	1			
	8	270D	●	232.0	324.9	60	32		1			
27.8 < D ≤ 28.8	3	SMDH 280M	●	96.0	185.1	60	32	MTL/MSL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	280L	●	154.0	245.1	60	32	MEL	1			
	8	280D	●	240.0	330.1	60	32		1			
28.8 < D ≤ 29.8	3	SMDH 290M	●	99.0	190.3	60	32	MTL/MSL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	290L	●	159.0	250.3	60	32	MEL	1			
	8	290D	●	248.0	340.3	60	32		1			

Recommended Cutting Conditions J105 | MTL type Heads J106, J107 | MSL type Heads J108, J109 | MEL type Heads J110, J111

* Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

N·m Recommended Tightening Torque (N·m)

SMD series (Internal Coolant Supply) Side Lock Flat/No Flange

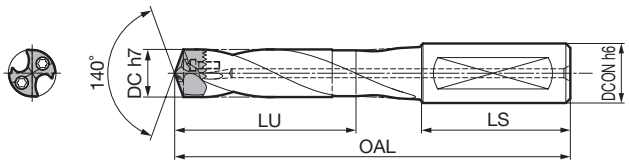
MTL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron
MSL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy
MEL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | NX Coat | Indexable head MTL | Indexable head MSL | Indexable head MEL | Coolant Hole | Indexable | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø29.8 to 42.5mm with MTL type/MSL type/MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	Cap Screw N·m	Wrench
29.8 < D ≤ 30.8	3	SMDH 300M	●	103.0	190.5	60	32	MTL/MSL MEL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	300L	●	164.0	260.5	60	32		1			
	8	300D	●	257.0	350.5	60	32		1			
30.8 < D ≤ 32.0	3	SMDH 320M	●	106.0	200.7	60	32	MTL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	320L	●	170.0	265.8	60	32		1			
	8	320D	●	266.0	360.8	60	32		1			
32.0 < D ≤ 33.5	3	SMDH 335M	●	111.0	205.9	60	32	MTL	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	335L	●	178.0	274.1	60	32		1			
	8	335D	●	279.0	376.1	60	32		1			
33.5 < D ≤ 35.0	3	SMDH 350M	●	116.0	221.2	70	40	MTL	1	BX0515	7.2	HD040
	5	350L	●	186.0	296.4	70	40		1			
	8	350D	●	291.0	401.4	70	40		1			
35.0 < D ≤ 36.5	3	SMDH 365M	●	121.0	226.4	70	40	MTL	1	BX0515	7.2	HD040
	5	365L	●	194.0	301.6	70	40		1			
	8	365D	●	303.0	411.6	70	40		1			
36.5 < D ≤ 38.0	3	SMDH 380M	●	125.0	231.7	70	40	MTL	1	BX0515	7.2	HD040
	5	380L	●	201.0	311.9	70	40		1			
	8	380D	●	315.0	426.9	70	40		1			
38.0 < D ≤ 39.5	3	SMDH 395M	●	130.0	237.0	70	40	MTL	1	BX0515	7.2	HD040
	5	395L	●	209.0	322.2	70	40		1			
	8	395D	●	328.0	437.2	70	40		1			
39.5 < D ≤ 41.0	3	SMDH 410M	●	135.0	252.2	70	40	MTL	1	BX0515	7.2	HD040
	5	410L	●	217.0	332.5	70	40		1			
	8	410D	●	340.0	457.5	70	40		1			
41.0 < D ≤ 42.5	3	SMDH 425M	●	140.0	257.5	70	40	MTL	1	BX0515	7.2	HD040
	5	425L	●	225.0	342.7	70	40		1			
	8	425D	●	352.0	467.7	70	40		1			

Recommended Cutting Conditions J105 | MTL type Head J107 | MSL type Head J109 | MEL type Head J111

* Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

SMD series (Internal Coolant Supply) Side Lock Flat/Flange

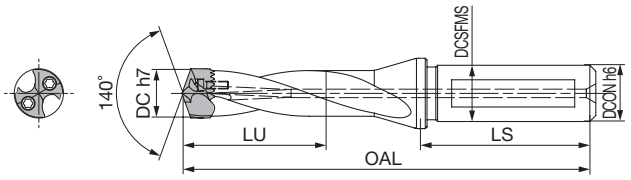
MTL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron
MSL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy
MEL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | NX Coat | Indexable head MTL | Indexable head MSL | Indexable head MEL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø12.0 to 24.8mm with MTL type / MSL type / MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	N·m	Wrench
12.0 ≤ D < 12.5	1.5	SMDH 120-1.5DF	●	23.0	90.5	48	20	16	MTL/MSL/MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	120-3DF	●	42.0	107.2	48	20	16		1			
	5	120-5DF	●	67.0	132.2	48	20	16		1			
	8	120-8DF	●	98.0	164.4	48	20	16		1			
12.5 ≤ D < 13.0	1.5	SMDH 125-1.5DF	●	24.0	91.0	48	20	16	MTL/MSL/MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	125-3DF	●	44.0	107.3	48	20	16		1			
	5	125-5DF	●	69.0	132.3	48	20	16		1			
	8	125-8DF	●	102.0	170.1	48	20	16		1			
13.0 ≤ D < 13.5	1.5	SMDH 130-1.5DF	●	25.0	92.2	48	20	16	MTL/MSL/MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	130-3DF	●	45.0	112.4	48	20	16		1			
	5	130-5DF	●	72.0	142.4	48	20	16		1			
	8	130-8DF	●	106.0	178.4	48	20	16		1			
13.5 ≤ D ≤ 14.5	1.5	SMDH 140-1.5DF	●	29.0	96.3	48	20	16	MTL/MSL/MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	140-3DF	●	51.0	119.0	48	20	16		1			
	5	140-5DF	●	80.0	149.0	48	20	16		1			
	8	140-8DF	●	123.0	194.0	48	20	16		1			
14.5 < D ≤ 15.5	1.5	SMDH 150-1.5DF	●	31.0	100.0	50	25	20	MTL/MSL/MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	150-3DF	●	54.0	129.2	50	25	20		1			
	5	150-5DF	●	85.0	159.2	50	25	20		1			
	8	150-8DF	●	131.0	204.2	50	25	20		1			
15.5 < D ≤ 16.5	1.5	SMDH 160-1.5DF	●	32.0	102.7	50	25	20	MTL/MSL/MEL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	160-3DF	●	57.0	134.4	50	25	20		1			
	5	160-5DF	●	90.0	169.4	50	25	20		1			
	8	160-8DF	●	140.0	214.4	50	25	20		1			
16.5 < D ≤ 17.5	1.5	SMDH 170-1.5DF	●	34.0	104.4	50	25	20	MTL/MSL/MEL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	170-3DF	●	60.0	139.6	50	25	20		1			
	5	170-5DF	●	95.0	174.6	50	25	20		1			
	8	170-8DF	●	148.0	224.6	50	25	20		1			
17.5 < D ≤ 18.5	1.5	SMDH 180-1.5DF	●	36.0	107.1	50	25	20	MTL/MSL/MEL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	180-3DF	●	63.0	144.8	50	25	20		1			
	5	180-5DF	●	100.0	179.8	50	25	20		1			
	8	180-8DF	●	156.0	229.8	50	25	20		1			
18.5 < D ≤ 19.5	1.5	SMDH 190-1.5DF	●	37.0	114.8	56	30	25	MTL/MSL/MEL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	190-3DF	●	67.0	160.0	56	30	25		1			
	5	190-5DF	●	106.0	195.0	56	30	25		1			
	8	190-8DF	●	164.0	255.0	56	30	25		1			
19.5 < D ≤ 20.5	1.5	SMDH 200-1.5DF	●	39.0	117.4	56	30	25	MTL/MSL/MEL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	200-3DF	●	70.0	160.1	56	30	25		1			
	5	200-5DF	●	111.0	200.1	56	30	25		1			
	8	200-8DF	●	172.0	265.1	56	30	25		1			
20.5 < D ≤ 21.5	1.5	SMDH 210-1.5DF	●	41.0	119.1	56	30	25	MTL/MSL/MEL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	210-3DF	●	73.0	160.3	56	30	25		1			
	5	210-5DF	●	116.0	200.3	56	30	25		1			
	8	210-8DF	●	180.0	270.3	56	30	25		1			
21.5 < D ≤ 22.8	1.5	SMDH 220-1.5DF	●	43.0	120.9	56	30	25	MTL/MSL/MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	220-3DF	●	77.0	165.1	56	30	25		1			
	5	220-5DF	●	123.0	205.1	56	30	25		1			
	8	220-8DF	●	191.0	275.1	56	30	25		1			
22.8 < D ≤ 23.8	1.5	SMDH 230-1.5DF	●	45.0	122.0	56	30	25	MTL/MSL/MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	230-3DF	●	80.0	164.7	56	30	25		1			
	5	230-5DF	●	128.0	214.7	56	30	25		1			
	8	230-8DF	●	199.0	284.7	56	30	25		1			
23.8 < D ≤ 24.8	1.5	SMDH 240-1.5DF	●	46.0	128.4	60	37	32	MTL/MSL/MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	240-3DF	●	83.0	174.6	60	37	32		1			
	5	240-5DF	●	133.0	224.6	60	37	32		1			
	8	240-8DF	●	207.0	299.6	60	37	32		1			

Recommended Cutting Conditions J105 | MTL type Heads J106, J107 | MSL type Heads J108, J109 | MEL type Heads J110, J111

*The SMDH○○○S Holder Cat. No. has been changed to SMDH○○○-1.5DF. The specifications have not changed.
*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

N·m Recommended Tightening Torque (N·m)

SMD series (Internal Coolant Supply) Side Lock Flat/Flange

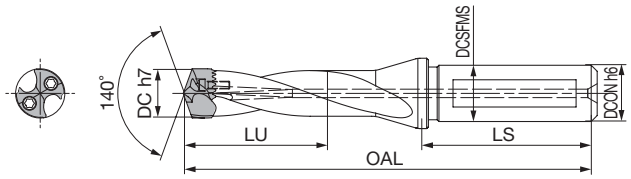
MTL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron
MSL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy
MEL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | NX Coat | Indexable head MTL | Indexable head MSL | Indexable head MEL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø24.8 to 30.8mm with MTL type / MSL type / MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	N·m	Wrench
24.8 < D ≤ 25.8	1.5	**SMDH 250-1.5DF**	●	48.0	128.8	60	37	32	MTL/MSL/MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	**250-3DF**	●	87.0	174.5	60	37	32		1			
	5	**250-5DF**	●	138.0	229.5	60	37	32		1			
	8	**250-8DF**	●	216.0	304.5	60	37	32		1			
25.8 < D ≤ 26.8	1.5	**SMDH 260-1.5DF**	●	50.0	131.5	60	37	32	MTL/MSL/MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	**260-3DF**	●	90.0	179.7	60	37	32		1			
	5	**260-5DF**	●	143.0	234.7	60	37	32		1			
	8	**260-8DF**	●	224.0	314.7	60	37	32		1			
26.8 < D ≤ 27.8	1.5	**SMDH 270-1.5DF**	●	51.0	132.2	60	37	32	MTL/MSL/MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	**270-3DF**	●	93.0	179.9	60	37	32		1			
	5	**270-5DF**	●	149.0	239.9	60	37	32		1			
	8	**270-8DF**	●	232.0	324.9	60	37	32		1			
27.8 < D ≤ 28.8	1.5	**SMDH 280-1.5DF**	●	53.0	133.9	60	37	32	MTL/MSL/MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	**280-3DF**	●	96.0	185.1	60	37	32		1			
	5	**280-5DF**	●	154.0	245.1	60	37	32		1			
	8	**280-8DF**	●	240.0	330.1	60	37	32		1			
28.8 < D ≤ 29.8	1.5	**SMDH 290-1.5DF**	●	55.0	135.6	60	37	32	MTL/MSL/MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	**290-3DF**	●	99.0	190.3	60	37	32		1			
	5	**290-5DF**	●	159.0	250.3	60	37	32		1			
	8	**290-8DF**	●	248.0	340.3	60	37	32		1			
29.8 < D ≤ 30.8	1.5	**SMDH 300-1.5DF**	●	56.0	138.3	60	37	32	MTL/MSL/MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	**300-3DF**	●	103.0	190.5	60	37	32		1			
	5	**300-5DF**	●	164.0	260.5	60	37	32		1			
	8	**300-8DF**	●	257.0	350.5	60	37	32		1			

Recommended Cutting Conditions J105 | MTL type Head J107 | MSL type Head J109 | MEL type Head J111

*The SMDH○○○S Holder Cat. No. has been changed to SMDH○○○-1.5DF. The specifications have not changed.
*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

SMD series (Internal Coolant Supply) No Side Lock Flat/Flange

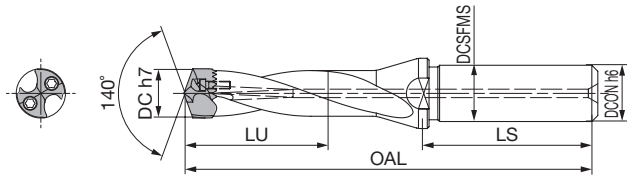
MTL	Carbon Steel/ Alloy Steel up to 0.28%	Carbon Steel/ Alloy Steel from 0.29%	Tempered Steel	Hardened Steel up to 45HRC	Cast Iron	Ductile Cast Iron		
MSL	Carbon Steel/ Alloy Steel up to 0.28%	Carbon Steel/ Alloy Steel from 0.29%	Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy
MEL	Carbon Steel/ Alloy Steel up to 0.28%	Carbon Steel/ Alloy Steel from 0.29%	Hardened Steel up to 45HRC	Stainless Steel	Ti Alloy	Heat-resistant Steel	Cast Iron	Ductile Cast Iron	Aluminum Alloy

DEX Coat | NX Coat | Indexable head MTL | Indexable head MSL | Indexable head MEL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø12.0 to 21.5mm with MTL type/MSL type/MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	N·m	Wrench
12.0 ≤ D < 12.5	1.5	SMDH 120-1.5D	●	23.0	90.5	48	20	16	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	120-3D	●	42.0	107.2	48	20	16		1			
	5	120-5D	●	67.0	132.2	48	20	16		1			
	8	120-8D	●	98.0	164.4	48	20	16		1			
	12	120-12D	●	146.0	213.3	48	20	16		1			
12.5 ≤ D < 13.0	1.5	SMDH 125-1.5D	●	24.0	91.0	48	20	16	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	125-3D	●	44.0	107.3	48	20	16		1			
	5	125-5D	●	69.0	132.3	48	20	16		1			
	8	125-8D	●	102.0	170.1	48	20	16		1			
	12	125-12D	●	152.0	219.5	48	20	16		1			
13.0 ≤ D < 13.5	1.5	SMDH 130-1.5D	●	25.0	92.2	48	20	16	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	130-3D	●	45.0	112.4	48	20	16		1			
	5	130-5D	●	72.0	142.4	48	20	16		1			
	8	130-8D	●	106.0	178.4	48	20	16		1			
	12	130-12D	●	158.0	225.7	48	20	16		1			
13.5 ≤ D ≤ 14.5	1.5	SMDH 140-1.5D	●	29.0	96.3	48	20	16	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	140-3D	●	51.0	119.0	48	20	16		1			
	5	140-5D	●	80.0	149.0	48	20	16		1			
	8	140-8D	●	123.0	194.0	48	20	16		1			
	12	140-12D	●	170.0	238.5	48	20	16		1			
14.5 < D ≤ 15.5	1.5	SMDH 150-1.5D	●	31.0	100.0	50	25	20	MTL/MSL MEL	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	150-3D	●	54.0	129.2	50	25	20		1			
	5	150-5D	●	85.0	159.2	50	25	20		1			
	8	150-8D	●	131.0	204.2	50	25	20		1			
	12	150-12D	●	182.0	253.0	50	25	20		1			
15.5 < D ≤ 16.5	1.5	SMDH 160-1.5D	●	32.0	102.7	50	25	20	MTL/MSL MEL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	160-3D	●	57.0	134.4	50	25	20		1			
	5	160-5D	●	90.0	169.4	50	25	20		1			
	8	160-8D	●	140.0	214.4	50	25	20		1			
	12	160-12D	●	194.0	265.5	50	25	20		1			
16.5 < D ≤ 17.5	1.5	SMDH 170-1.5D	●	34.0	104.4	50	25	20	MTL/MSL MEL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	170-3D	●	60.0	139.6	50	25	20		1			
	5	170-5D	●	95.0	174.6	50	25	20		1			
	8	170-8D	●	148.0	224.6	50	25	20		1			
	12	170-12D	●	207.0	278.1	50	25	20		1			
17.5 < D ≤ 18.5	1.5	SMDH 180-1.5D	●	36.0	107.1	50	25	20	MTL/MSL MEL	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	180-3D	●	63.0	144.8	50	25	20		1			
	5	180-5D	●	100.0	179.8	50	25	20		1			
	8	180-8D	●	156.0	229.8	50	25	20		1			
	12	180-12D	●	219.0	290.5	50	25	20		1			
18.5 < D ≤ 19.5	1.5	SMDH 190-1.5D	●	37.0	114.8	56	30	25	MTL/MSL MEL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	190-3D	●	67.0	160.0	56	30	25		1			
	5	190-5D	●	106.0	195.0	56	30	25		1			
	8	190-8D	●	164.0	255.0	56	30	25		1			
	12	190-12D	●	231.0	309.1	56	30	25		1			
19.5 < D ≤ 20.5	1.5	SMDH 200-1.5D	●	39.0	117.4	56	30	25	MTL/MSL MEL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	200-3D	●	70.0	160.1	56	30	25		1			
	5	200-5D	●	111.0	200.1	56	30	25		1			
	8	200-8D	●	172.0	265.1	56	30	25		1			
	12	200-12D	●	243.0	321.4	56	30	25		1			
20.5 < D ≤ 21.5	1.5	SMDH 210-1.5D	●	41.0	119.1	56	30	25	MTL/MSL MEL	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	210-3D	●	73.0	160.3	56	30	25		1			
	5	210-5D	●	116.0	200.3	56	30	25		1			
	8	210-8D	●	180.0	270.3	56	30	25		1			
	12	210-12D	●	255.0	333.9	56	30	25		1			

Recommended Cutting Conditions J105 | MTL type Head J106 | MSL type Head J108 | MEL type Head J110

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

N·m Recommended Tightening Torque (N·m)

SMD series (Internal Coolant Supply) No Side Lock Flat/Flange

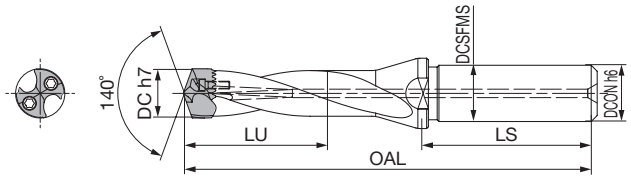
MTL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron
MSL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy
MEL: Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Heat-resistant Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | NX Coat | Indexable head MTL | Indexable head MSL | Indexable head MEL | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø21.5 to 30.8mm with MTL type / MSL type / MEL type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	Cap Screw N·m	Wrench
21.5 < D ≤ 22.8	1.5	SMDH 220-1.5D	●	43.0	120.9	56	30	25	MTL/MSL MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	220-3D	●	77.0	165.1	56	30	25		1			
	5	220-5D	●	123.0	205.1	56	30	25		1			
	8	220-8D	●	191.0	275.1	56	30	25		1			
	12	220-12D	●	268.0	347.0	56	30	25		1			
22.8 < D ≤ 23.8	1.5	SMDH 230-1.5D	●	45.0	122.0	56	30	25	MTL/MSL MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	230-3D	●	80.0	164.7	56	30	25		1			
	5	230-5D	●	128.0	214.7	56	30	25		1			
	8	230-8D	●	199.0	284.7	56	30	25		1			
	12	230-12D	●	280.0	359.0	56	30	25		1			
23.8 < D ≤ 24.8	1.5	SMDH 240-1.5D	●	46.0	128.4	60	37	32	MTL/MSL MEL	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	240-3D	●	83.0	174.6	60	37	32		1			
	5	240-5D	●	133.0	224.6	60	37	32		1			
	8	240-8D	●	207.0	299.6	60	37	32		1			
	12	240-12D	●	292.0	376.1	60	37	32		1			
24.8 < D ≤ 25.8	1.5	SMDH 250-1.5D	●	48.0	128.8	60	37	32	MTL/MSL MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	250-3D	●	87.0	174.5	60	37	32		1			
	5	250-5D	●	138.0	229.5	60	37	32		1			
	8	250-8D	●	216.0	304.5	60	37	32		1			
	12	250-12D	●	304.0	388.3	60	37	32		1			
25.8 < D ≤ 26.8	1.5	SMDH 260-1.5D	●	50.0	131.5	60	37	32	MTL/MSL MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	260-3D	●	90.0	179.7	60	37	32		1			
	5	260-5D	●	143.0	234.7	60	37	32		1			
	8	260-8D	●	224.0	314.7	60	37	32		1			
	12	260-12D	●	316.0	400.8	60	37	32		1			
26.8 < D ≤ 27.8	1.5	SMDH 270-1.5D	●	51.0	132.2	60	37	32	MTL/MSL MEL	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	270-3D	●	93.0	179.9	60	37	32		1			
	5	270-5D	●	149.0	239.9	60	37	32		1			
	8	270-8D	●	232.0	324.9	60	37	32		1			
	12	270-12D	●	328.0	413.3	60	37	32		1			
27.8 < D ≤ 28.8	1.5	SMDH 280-1.5D	●	53.0	133.9	60	37	32	MTL/MSL MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	280-3D	●	96.0	185.1	60	37	32		1			
	5	280-5D	●	154.0	245.1	60	37	32		1			
	8	280-8D	●	240.0	330.1	60	37	32		1			
	12	280-12D	●	341.0	425.8	60	37	32		1			
28.8 < D ≤ 29.8	1.5	SMDH 290-1.5D	●	55.0	135.6	60	37	32	MTL/MSL MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	290-3D	●	99.0	190.3	60	37	32		1			
	5	290-5D	●	159.0	250.3	60	37	32		1			
	8	290-8D	●	248.0	340.3	60	37	32		1			
	12	290-12D	●	353.0	438.4	60	37	32		1			
29.8 < D ≤ 30.8	1.5	SMDH 300-1.5D	●	56.0	138.3	60	37	32	MTL/MSL MEL	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	300-3D	●	103.0	190.5	60	37	32		1			
	5	300-5D	●	164.0	260.5	60	37	32		1			
	8	300-8D	●	257.0	350.5	60	37	32		1			
	12	300-12D	●	365.0	450.8	60	37	32		1			

Recommended Cutting Conditions J105 | MTL type Heads J106, J107 | MSL type Heads J108, J109 | MEL type Heads J110, J111

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

MFS type Ideal for drilling and burr control on non-flat surfaces

Suited to various types of drilling thanks to a point angle of 180°

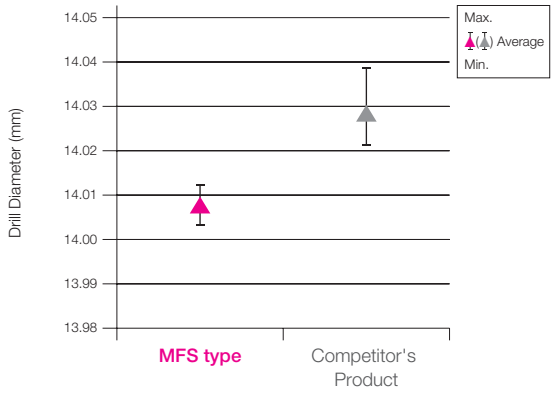
Supports high-efficiency flat bottom drilling, drilling on non-flat surfaces such as inclined and cylindrical surfaces, and interrupted drilling. Also reduces burrs at the hole exit.

Improved drilling stability

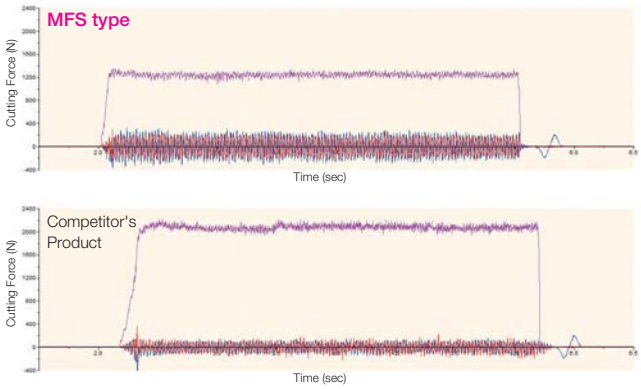
Achieves high rigidity by employing RS THINNING, which ensures thick web at the bottom.

■ Performance

Comparison of Hole Diameter Accuracy

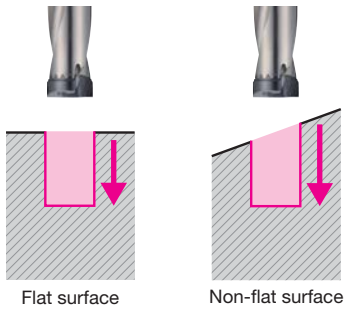
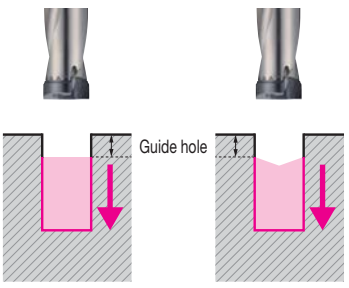
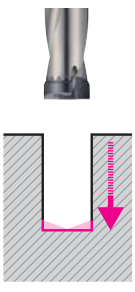


Comparison of Cutting Force



Tool : SMDH140-1.5DF + SMDT1400MFS
Work Material : S50C
Cutting Conditions : vc = 100mm/min f = 0.15mm/rev **Hole depth** 21mm Wet

■ Precautions when Using MFS type Heads

Applications	No guide hole (direct drilling)	With guide hole	Flat Finishing of Hole Bottom
	 Flat surface / Non-flat surface	 Guide hole	
1.5D holder	○	○ (guide hole not needed)	○
3D to 12D holders	×	×	○

■ Recommended Cutting Conditions (MFS type)

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Work Material		Mild Steel (up to 250HB)	General Steel (250 to 320HB)	Hardened Steel (45HRC)	Stainless Steel (up to 200HB)	Gray Cast Iron	Ductile Cast Iron	Aluminum Alloy*
Diameter DC (mm)	Cutting Conditions	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.
ø16.0	n	2,000	2,000	1,200	1,200	1,400	1,200	4,800
	vc	60-**100**-120	70-**100**-120	40-**60**-90	50-**60**-80	50-**70**-90	50-**60**-80	200-**240**-260
	f	0.15-**0.20**-0.35	0.15-**0.20**-0.30	0.10-**0.15**-0.20	0.10-**0.15**-0.20	0.20-**0.25**-0.30	0.20-**0.25**-0.30	0.35-**0.45**-0.55
ø20.0	n	1,600	1,600	1,000	1,100	1,300	1,100	3,800
	vc	80-**100**-120	70-**100**-120	40-**60**-90	60-**70**-90	60-**80**-100	50-**70**-90	200-**240**-260
	f	0.15-**0.25**-0.35	0.15-**0.25**-0.35	0.15-**0.20**-0.25	0.15-**0.20**-0.25	0.20-**0.30**-0.35	0.20-**0.25**-0.35	0.35-**0.50**-0.60
ø30.8	n	1,000	1,000	600	700	800	700	2,500
	vc	80-**100**-120	70-**100**-120	40-**60**-90	60-**70**-90	60-**80**-100	50-**70**-90	200-**240**-260
	f	0.20-**0.30**-0.35	0.20-**0.25**-0.35	0.15-**0.20**-0.25	0.15-**0.20**-0.25	0.20-**0.30**-0.40	0.25-**0.30**-0.35	0.35-**0.50**-0.60

Note: The recommended hole depth is 2 x DC. The depth is measured from the highest point of the hole when drilling in inclined surfaces.
The recommended cutting conditions are those for drilling in flat horizontal surfaces.
Adjust the feed rate according to the inclination angle when drilling in an inclined surface.
Set the feed rate at 70% or lower when the inclination angle is 30° or less.
Set the feed rate at 50% or lower when the inclination angle is larger than 30°.
This product is a drilling tool. Do not use it for traverse cutting or helical milling.

*Inquire if you require special drill heads for aluminum alloy.

SMD series (Internal Coolant Supply)

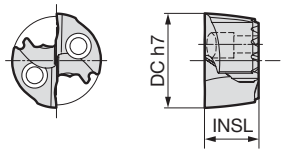
MFS | Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MFS | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h7

Indexable Head

Fig 1



Indexable Head MFS type Diameter ø12.0 to 21.5mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Applicable Holder	Fig
12.0	●	SMDT 1200 MFS	7.1	SMDH120□	1
12.5	●	1250 MFS	7.2	SMDH125□	1
13.0	●	1300 MFS	7.5	SMDH130□	1
13.5	●	SMDT 1350 MFS	7.9	SMDH140□	1
14.0	●	1400 MFS	7.9		1
14.5	●	1450 MFS	7.9		1
15.0	●	SMDT 1500 MFS	8.3	SMDH150□	1
15.5	●	1550 MFS	8.3		1
16.0	●	SMDT 1600 MFS	8.8	SMDH160□	1
16.5	●	1650 MFS	8.8		1
17.0	●	SMDT 1700 MFS	9.3	SMDH170□	1
17.5	●	1750 MFS	9.3		1
18.0	●	SMDT 1800 MFS	9.8	SMDH180□	1
18.5	●	1850 MFS	9.8		1
19.0	●	SMDT 1900 MFS	10.2	SMDH190□	1
19.5	●	1950 MFS	10.2		1
20.0	●	SMDT 2000 MFS	10.7	SMDH200□	1
20.5	●	2050 MFS	10.7		1
21.0	●	SMDT 2100 MFS	11.2	SMDH210□	1
21.5	●	2150 MFS	11.2		1

Grade: ACX70

Recommended Cutting Conditions J118
Applicable Holders J120, J122, J124

Indexable Head MFS type Diameter ø22.0 to 30.0mm

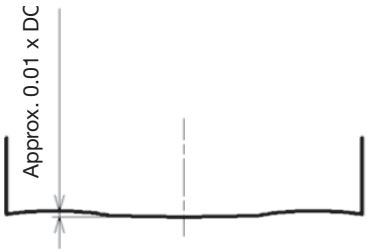
Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Applicable Holder	Fig
22.0	●	SMDT 2200 MFS	11.2	SMDH220□	1
22.5	●	2250 MFS	11.2		1
23.0	●	SMDT 2300 MFS	11.2	SMDH230□	1
23.5	●	2350 MFS	11.2		1
24.0	●	SMDT 2400 MFS	11.3	SMDH240□	1
24.5	●	2450 MFS	11.3		1
25.0	●	SMDT 2500 MFS	11.7	SMDH250□	1
25.5	●	2550 MFS	11.7		1
26.0	●	SMDT 2600 MFS	12.2	SMDH260□	1
26.5	●	2650 MFS	12.2		1
27.0	●	SMDT 2700 MFS	12.7	SMDH270□	1
27.5	●	2750 MFS	12.7		1
28.0	●	SMDT 2800 MFS	13.2	SMDH280□	1
28.5	●	2850 MFS	13.2		1
29.0	●	SMDT 2900 MFS	13.6	SMDH290□	1
29.5	●	2950 MFS	13.6		1
30.0	●	SMDT 3000 MFS	14.1	SMDH300□	1

Grade: ACX70

Recommended Cutting Conditions J118
Applicable Holders J120 to J123, J125

Shape of Hole Bottom Drilled with MFS type



The drilled hole bottom is not completely flat.
Contact us for more details.

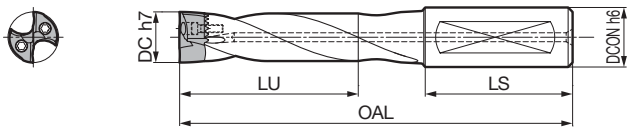
SMD series (Internal Coolant Supply) Side Lock Flat/No Flange

MFS | Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.28% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MFS | Coolant Hole | Indexable | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure Fig 1



Holder ø12.0 to 29.8mm with MFS type set

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Parts: Cap Screw	Parts: Cap Screw N·m	Parts: Wrench
12.0 ≤ D < 12.5	3	SMDH 120M	●	40.0	105.2	48	16	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	120L	●	65.0	130.2	48	16		1			
12.5 ≤ D < 13.0	3	SMDH 125M	●	41.0	105.1	48	16	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	125L	●	67.0	130.1	48	16		1			
13.0 ≤ D < 13.5	3	SMDH 130M	●	43.0	110.2	48	16	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	130L	●	70.0	140.2	48	16		1			
13.5 ≤ D ≤ 14.5	3	SMDH 140M	●	48.0	116.6	48	16	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	140L	●	77.0	146.6	48	16		1			
	8	140D	●	121.0	191.6	48	16		1			
14.5 < D ≤ 15.5	3	SMDH 150M	●	51.0	126.6	50	20	MFS	1	BXD02208IP	0.75 to 1.00	TRDR08IP
	5	150L	●	82.0	156.6	50	20		1			
	8	150D	●	129.0	201.6	50	20		1			
15.5 < D ≤ 16.5	3	SMDH 160M	●	54.0	131.6	50	20	MFS	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	160L	●	87.0	166.6	50	20		1			
	8	160D	●	137.0	211.6	50	20		1			
16.5 < D ≤ 17.5	3	SMDH 170M	●	57.0	136.6	50	20	MFS	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	170L	●	92.0	171.6	50	20		1			
	8	170D	●	145.0	221.6	50	20		1			
17.5 < D ≤ 18.5	3	SMDH 180M	●	60.0	141.7	50	20	MFS	1	BXD02509IP	0.93 to 1.24	TRDR10IP
	5	180L	●	97.0	176.7	50	20		1			
	8	180D	●	153.0	226.7	50	20		1			
18.5 < D ≤ 19.5	3	SMDH 190M	●	63.0	156.6	56	25	MFS	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	190L	●	102.0	191.6	56	25		1			
	8	190D	●	161.0	251.6	56	25		1			
19.5 < D ≤ 20.5	3	SMDH 200M	●	66.0	156.7	56	25	MFS	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	200L	●	107.0	196.7	56	25		1			
	8	200D	●	169.0	261.7	56	25		1			
20.5 < D ≤ 21.5	3	SMDH 210M	●	69.0	156.7	56	25	MFS	1	BXD03011IP	1.83 to 2.44	TRDR15IP
	5	210L	●	112.0	196.7	56	25		1			
	8	210D	●	177.0	266.7	56	25		1			
21.5 < D ≤ 22.8	3	SMDH 220M	●	73.0	161.3	56	25	MFS	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	220L	●	119.0	201.3	56	25		1			
	8	220D	●	187.0	271.3	56	25		1			
22.8 < D ≤ 23.8	3	SMDH 230M	●	76.0	160.7	56	25	MFS	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	230L	●	124.0	210.7	56	25		1			
	8	230D	●	195.0	280.7	56	25		1			
23.8 < D ≤ 24.8	3	SMDH 240M	●	79.0	170.5	60	32	MFS	1	BXD03512IP	2.79 to 3.72	TRDR15IP
	5	240L	●	129.0	220.5	60	32		1			
	8	240D	●	203.0	295.5	60	32		1			
24.8 < D ≤ 25.8	3	SMDH 250M	●	82.0	170.4	60	32	MFS	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	250L	●	134.0	225.4	60	32		1			
	8	250D	●	211.0	300.4	60	32		1			
25.8 < D ≤ 26.8	3	SMDH 260M	●	85.0	175.5	60	32	MFS	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	260L	●	139.0	230.5	60	32		1			
	8	260D	●	219.0	310.5	60	32		1			
26.8 < D ≤ 27.8	3	SMDH 270M	●	88.0	175.5	60	32	MFS	1	BXD04014IP	4.14 to 5.52	TRDR20IP
	5	270L	●	144.0	235.5	60	32		1			
	8	270D	●	227.0	320.5	60	32		1			
27.8 < D ≤ 28.8	3	SMDH 280M	●	91.0	180.6	60	32	MFS	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	280L	●	149.0	240.6	60	32		1			
	8	280D	●	235.0	325.6	60	32		1			
28.8 < D ≤ 29.8	3	SMDH 290M	●	94.0	185.4	60	32	MFS	1	BXD04515IP	4.98 to 6.64	TRDR25IP
	5	290L	●	154.0	245.4	60	32		1			
	8	290D	●	243.0	335.4	60	32		1			

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

Recommended Cutting Conditions J118
MFS type Head J119

N·m Recommended Tightening Torque (N·m)

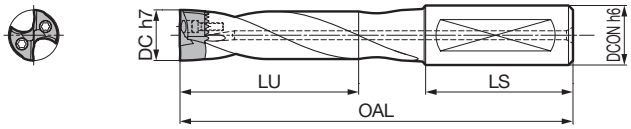
SMD series (Internal Coolant Supply) Side Lock Flat/No Flange

MFS | Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MFS | Coolant Hole | Indexable | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure Fig 1



Holder ø29.8 to 30.8mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
											N·m	
29.8 < D ≤ 30.8	3	**SMDH 300M**	●	**97.0**	**185.6**	60	32	MFS	1	BXD04515IP	**4.98 to 6.64**	TRDR25IP
	5	**300L**	●	**159.0**	**255.6**	60	32		1			
	8	**300D**	●	**251.0**	**345.6**	60	32		1			

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

Recommended Cutting Conditions J118
MFS type Head J119

SMD series (Internal Coolant Supply) Side Lock Flat/Flange

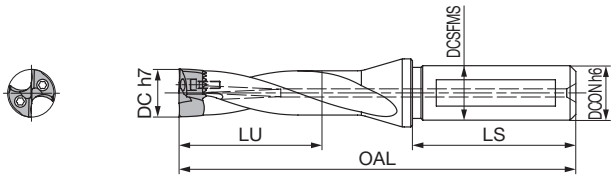
MFS | Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MFS | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø12.0 to 24.8mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw		Wrench
												N·m	
12.0 ≤ D < 12.5	1.5	SMDH 120-1.5DF	●	21.0	88.5	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	120-3DF	●	40.0	105.2	48	20	16		1			
	5	120-5DF	●	65.0	130.2	48	20	16		1			
	8	120-8DF	●	96.0	162.4	48	20	16		1			
12.5 ≤ D < 13.0	1.5	SMDH 125-1.5DF	●	22.0	88.8	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	125-3DF	●	41.0	105.1	48	20	16		1			
	5	125-5DF	●	67.0	130.1	48	20	16		1			
	8	125-8DF	●	100.0	167.9	48	20	16		1			
13.0 ≤ D < 13.5	1.5	SMDH 130-1.5DF	●	23.0	90.0	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	130-3DF	●	43.0	110.2	48	20	16		1			
	5	130-5DF	●	70.0	140.2	48	20	16		1			
	8	130-8DF	●	104.0	176.2	48	20	16		1			
13.5 ≤ D ≤ 14.5	1.5	SMDH 140-1.5DF	●	26.0	93.9	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	140-3DF	●	48.0	116.6	48	20	16		1			
	5	140-5DF	●	77.0	146.6	48	20	16		1			
	8	140-8DF	●	121.0	191.6	48	20	16		1			
14.5 < D ≤ 15.5	1.5	SMDH 150-1.5DF	●	28.0	97.3	50	25	20	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	150-3DF	●	51.0	126.6	50	25	20		1			
	5	150-5DF	●	82.0	156.6	50	25	20		1			
	8	150-8DF	●	129.0	201.6	50	25	20		1			
15.5 < D ≤ 16.5	1.5	SMDH 160-1.5DF	●	29.0	99.9	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	160-3DF	●	54.0	131.6	50	25	20		1			
	5	160-5DF	●	87.0	166.6	50	25	20		1			
	8	160-8DF	●	137.0	211.6	50	25	20		1			
16.5 < D ≤ 17.5	1.5	SMDH 170-1.5DF	●	31.0	101.4	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	170-3DF	●	57.0	136.6	50	25	20		1			
	5	170-5DF	●	92.0	171.6	50	25	20		1			
	8	170-8DF	●	145.0	221.6	50	25	20		1			
17.5 < D ≤ 18.5	1.5	SMDH 180-1.5DF	●	32.0	104.0	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	180-3DF	●	60.0	141.7	50	25	20		1			
	5	180-5DF	●	97.0	176.7	50	25	20		1			
	8	180-8DF	●	153.0	226.7	50	25	20		1			
18.5 < D ≤ 19.5	1.5	SMDH 190-1.5DF	●	34.0	111.4	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	190-3DF	●	63.0	156.6	56	30	25		1			
	5	190-5DF	●	102.0	191.6	56	30	25		1			
	8	190-8DF	●	161.0	251.6	56	30	25		1			
19.5 < D ≤ 20.5	1.5	SMDH 200-1.5DF	●	35.0	114.0	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	200-3DF	●	66.0	156.7	56	30	25		1			
	5	200-5DF	●	107.0	196.7	56	30	25		1			
	8	200-8DF	●	169.0	261.7	56	30	25		1			
20.5 < D ≤ 21.5	1.5	SMDH 210-1.5DF	●	37.0	115.5	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	210-3DF	●	69.0	156.7	56	30	25		1			
	5	210-5DF	●	112.0	196.7	56	30	25		1			
	8	210-8DF	●	177.0	266.7	56	30	25		1			
21.5 < D ≤ 22.8	1.5	SMDH 220-1.5DF	●	39.0	117.1	56	30	25	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	220-3DF	●	73.0	161.3	56	30	25		1			
	5	220-5DF	●	119.0	201.3	56	30	25		1			
	8	220-8DF	●	187.0	271.3	56	30	25		1			
22.8 < D ≤ 23.8	1.5	SMDH 230-1.5DF	●	40.0	118.0	56	30	25	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	230-3DF	●	76.0	160.7	56	30	25		1			
	5	230-5DF	●	124.0	210.7	56	30	25		1			
	8	230-8DF	●	195.0	280.7	56	30	25		1			
23.8 < D ≤ 24.8	1.5	SMDH 240-1.5DF	●	42.0	124.3	60	37	32	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	240-3DF	●	79.0	170.5	60	37	32		1			
	5	240-5DF	●	129.0	220.5	60	37	32		1			
	8	240-8DF	●	203.0	295.5	60	37	32		1			

*The SMDH○○○S Holder Cat. No. has been changed to SMDH○○○-1.5DF. The specifications have not changed.
*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

Recommended Cutting Conditions J118
MFS type Head J119

N·m Recommended Tightening Torque (N·m)

SMD series (Internal Coolant Supply) Side Lock Flat/Flange

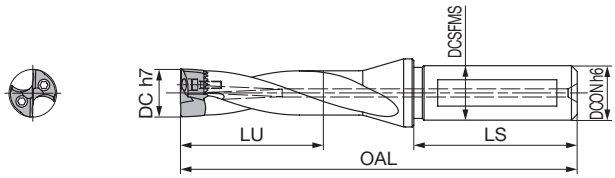
MFS | Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MFS | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø24.8 to 30.8mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	N·m	Wrench
24.8 < D ≤ 25.8	1.5	SMDH 250-1.5DF	●	43.0	124.7	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	250-3DF	●	82.0	170.4	60	37	32		1			
	5	250-5DF	●	134.0	225.4	60	37	32		1			
	8	250-8DF	●	211.0	300.4	60	37	32		1			
25.8 < D ≤ 26.8	1.5	SMDH 260-1.5DF	●	45.0	127.3	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	260-3DF	●	85.0	175.5	60	37	32		1			
	5	260-5DF	●	139.0	230.5	60	37	32		1			
	8	260-8DF	●	219.0	310.5	60	37	32		1			
26.8 < D ≤ 27.8	1.5	SMDH 270-1.5DF	●	46.0	127.8	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	270-3DF	●	88.0	175.5	60	37	32		1			
	5	270-5DF	●	144.0	235.5	60	37	32		1			
	8	270-8DF	●	227.0	320.5	60	37	32		1			
27.8 < D ≤ 28.8	1.5	SMDH 280-1.5DF	●	48.0	129.4	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	280-3DF	●	91.0	180.6	60	37	32		1			
	5	280-5DF	●	149.0	240.6	60	37	32		1			
	8	280-8DF	●	235.0	325.6	60	37	32		1			
28.8 < D ≤ 29.8	1.5	SMDH 290-1.5DF	●	49.0	130.8	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	290-3DF	●	94.0	185.4	60	37	32		1			
	5	290-5DF	●	154.0	245.4	60	37	32		1			
	8	290-8DF	●	243.0	335.4	60	37	32		1			
29.8 < D ≤ 30.8	1.5	SMDH 300-1.5DF	●	51.0	133.4	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	300-3DF	●	97.0	185.6	60	37	32		1			
	5	300-5DF	●	159.0	255.6	60	37	32		1			
	8	300-8DF	●	251.0	345.6	60	37	32		1			

*The SMDH○○○S Holder Cat. No. has been changed to SMDH○○○-1.5DF. The specifications have not changed.
*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

Recommended Cutting Conditions J118
MFS type Head J119

SMD series (Internal Coolant Supply) No Side Lock Flat/Flange MFS

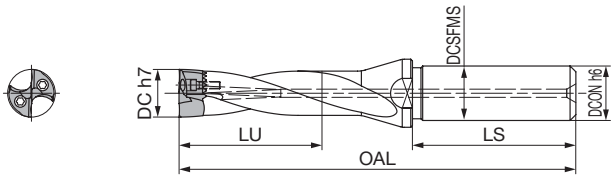
Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MFS | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø12.0 to 21.5mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	Cap Screw N·m	Wrench
12.0 ≤ D < 12.5	1.5	SMDH 120-1.5D	●	21.0	88.5	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	120-3D	●	40.0	105.2	48	20	16		1			
	5	120-5D	●	65.0	130.2	48	20	16		1			
	8	120-8D	●	96.0	162.4	48	20	16		1			
	12	120-12D	●	144.0	211.3	48	20	16		1			
12.5 ≤ D < 13.0	1.5	SMDH 125-1.5D	●	22.0	88.8	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	125-3D	●	41.0	105.1	48	20	16		1			
	5	125-5D	●	67.0	130.1	48	20	16		1			
	8	125-8D	●	100.0	167.9	48	20	16		1			
	12	125-12D	●	150.0	217.3	48	20	16		1			
13.0 ≤ D < 13.5	1.5	SMDH 130-1.5D	●	23.0	90.0	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	130-3D	●	43.0	110.2	48	20	16		1			
	5	130-5D	●	70.0	140.2	48	20	16		1			
	8	130-8D	●	104.0	176.2	48	20	16		1			
	12	130-12D	●	156.0	223.5	48	20	16		1			
13.5 ≤ D ≤ 14.5	1.5	SMDH 140-1.5D	●	26.0	93.9	48	20	16	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	140-3D	●	48.0	116.6	48	20	16		1			
	5	140-5D	●	77.0	146.6	48	20	16		1			
	8	140-8D	●	121.0	191.6	48	20	16		1			
	12	140-12D	●	168.0	236.1	48	20	16		1			
14.5 < D ≤ 15.5	1.5	SMDH 150-1.5D	●	28.0	97.3	50	25	20	MFS	1	BXD02208IPC	0.75 to 1.00	TRDR08IP
	3	150-3D	●	51.0	126.6	50	25	20		1			
	5	150-5D	●	82.0	156.6	50	25	20		1			
	8	150-8D	●	129.0	201.6	50	25	20		1			
	12	150-12D	●	180.0	250.4	50	25	20		1			
15.5 < D ≤ 16.5	1.5	SMDH 160-1.5D	●	29.0	99.9	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	160-3D	●	54.0	131.6	50	25	20		1			
	5	160-5D	●	87.0	166.6	50	25	20		1			
	8	160-8D	●	137.0	211.6	50	25	20		1			
	12	160-12D	●	192.0	262.7	50	25	20		1			
16.5 < D ≤ 17.5	1.5	SMDH 170-1.5D	●	31.0	101.4	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	170-3D	●	57.0	136.6	50	25	20		1			
	5	170-5D	●	92.0	171.6	50	25	20		1			
	8	170-8D	●	145.0	221.6	50	25	20		1			
	12	170-12D	●	204.0	275.1	50	25	20		1			
17.5 < D ≤ 18.5	1.5	SMDH 180-1.5D	●	32.0	104.0	50	25	20	MFS	1	BXD02509IPC	0.93 to 1.24	TRDR10IP
	3	180-3D	●	60.0	141.7	50	25	20		1			
	5	180-5D	●	97.0	176.7	50	25	20		1			
	8	180-8D	●	153.0	226.7	50	25	20		1			
	12	180-12D	●	216.0	287.4	50	25	20		1			
18.5 < D ≤ 19.5	1.5	SMDH 190-1.5D	●	34.0	111.4	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	190-3D	●	63.0	156.6	56	30	25		1			
	5	190-5D	●	102.0	191.6	56	30	25		1			
	8	190-8D	●	161.0	251.6	56	30	25		1			
	12	190-12D	●	228.0	305.7	56	30	25		1			
19.5 < D ≤ 20.5	1.5	SMDH 200-1.5D	●	35.0	114.0	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	200-3D	●	66.0	156.7	56	30	25		1			
	5	200-5D	●	107.0	196.7	56	30	25		1			
	8	200-8D	●	169.0	261.7	56	30	25		1			
	12	200-12D	●	240.0	318.0	56	30	25		1			
20.5 < D ≤ 21.5	1.5	SMDH 210-1.5D	●	37.0	115.5	56	30	25	MFS	1	BXD03011IPC	1.83 to 2.44	TRDR15IP
	3	210-3D	●	69.0	156.7	56	30	25		1			
	5	210-5D	●	112.0	196.7	56	30	25		1			
	8	210-8D	●	177.0	266.7	56	30	25		1			
	12	210-12D	●	252.0	330.3	56	30	25		1			

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

Recommended Cutting Conditions J118

MFS type Head J119

N·m Recommended Tightening Torque (N·m)

SMD series (Internal Coolant Supply) No Side Lock Flat/Flange

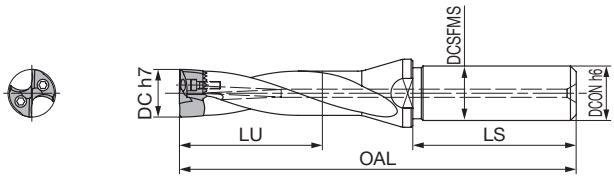
MFS | Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

DEX Coat | Indexable head MFS | Coolant Hole | Indexable | 1.5D | 3D | 5D | 8D | 12D

*Refer to N36 for the tolerance of h6 and h7

● Set Figure

Fig 1



Holder ø21.5 to 30.8mm with MFS type set

Parts

Dimensions (mm)

Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	Cap Screw N·m	Wrench
21.5 < D ≤ 22.8	1.5	SMDH 220-1.5D	●	39.0	117.1	56	30	25	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	220-3D	●	73.0	161.3	56	30	25		1			
	5	220-5D	●	119.0	201.3	56	30	25		1			
	8	220-8D	●	187.0	271.3	56	30	25		1			
	12	220-12D	●	264.0	343.2	56	30	25		1			
22.8 < D ≤ 23.8	1.5	SMDH 230-1.5D	●	40.0	118.0	56	30	25	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	230-3D	●	76.0	160.7	56	30	25		1			
	5	230-5D	●	124.0	210.7	56	30	25		1			
	8	230-8D	●	195.0	280.7	56	30	25		1			
	12	230-12D	●	276.0	355.0	56	30	25		1			
23.8 < D ≤ 24.8	1.5	SMDH 240-1.5D	●	42.0	124.3	60	37	32	MFS	1	BXD03512IPC	2.79 to 3.72	TRDR15IP
	3	240-3D	●	79.0	170.5	60	37	32		1			
	5	240-5D	●	129.0	220.5	60	37	32		1			
	8	240-8D	●	203.0	295.5	60	37	32		1			
	12	240-12D	●	288.0	372.0	60	37	32		1			
24.8 < D ≤ 25.8	1.5	SMDH 250-1.5D	●	43.0	124.7	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	250-3D	●	82.0	170.4	60	37	32		1			
	5	250-5D	●	134.0	225.4	60	37	32		1			
	8	250-8D	●	211.0	300.4	60	37	32		1			
	12	250-12D	●	300.0	384.2	60	37	32		1			
25.8 < D ≤ 26.8	1.5	SMDH 260-1.5D	●	45.0	127.3	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	260-3D	●	85.0	175.5	60	37	32		1			
	5	260-5D	●	139.0	230.5	60	37	32		1			
	8	260-8D	●	219.0	310.5	60	37	32		1			
	12	260-12D	●	312.0	396.6	60	37	32		1			
26.8 < D ≤ 27.8	1.5	SMDH 270-1.5D	●	46.0	127.8	60	37	32	MFS	1	BXD04014IPC	4.14 to 5.52	TRDR20IP
	3	270-3D	●	88.0	175.5	60	37	32		1			
	5	270-5D	●	144.0	235.5	60	37	32		1			
	8	270-8D	●	227.0	320.5	60	37	32		1			
	12	270-12D	●	324.0	408.9	60	37	32		1			
27.8 < D ≤ 28.8	1.5	SMDH 280-1.5D	●	48.0	129.4	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	280-3D	●	91.0	180.6	60	37	32		1			
	5	280-5D	●	149.0	240.6	60	37	32		1			
	8	280-8D	●	235.0	325.6	60	37	32		1			
	12	280-12D	●	336.0	421.3	60	37	32		1			
28.8 < D ≤ 29.8	1.5	SMDH 290-1.5D	●	49.0	130.8	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	290-3D	●	94.0	185.4	60	37	32		1			
	5	290-5D	●	154.0	245.4	60	37	32		1			
	8	290-8D	●	243.0	335.4	60	37	32		1			
	12	290-12D	●	348.0	433.5	60	37	32		1			
29.8 < D ≤ 30.8	1.5	SMDH 300-1.5D	●	51.0	133.4	60	37	32	MFS	1	BXD04515IPC	4.98 to 6.64	TRDR25IP
	3	300-3D	●	97.0	185.6	60	37	32		1			
	5	300-5D	●	159.0	255.6	60	37	32		1			
	8	300-8D	●	251.0	345.6	60	37	32		1			
	12	300-12D	●	360.0	445.9	60	37	32		1			

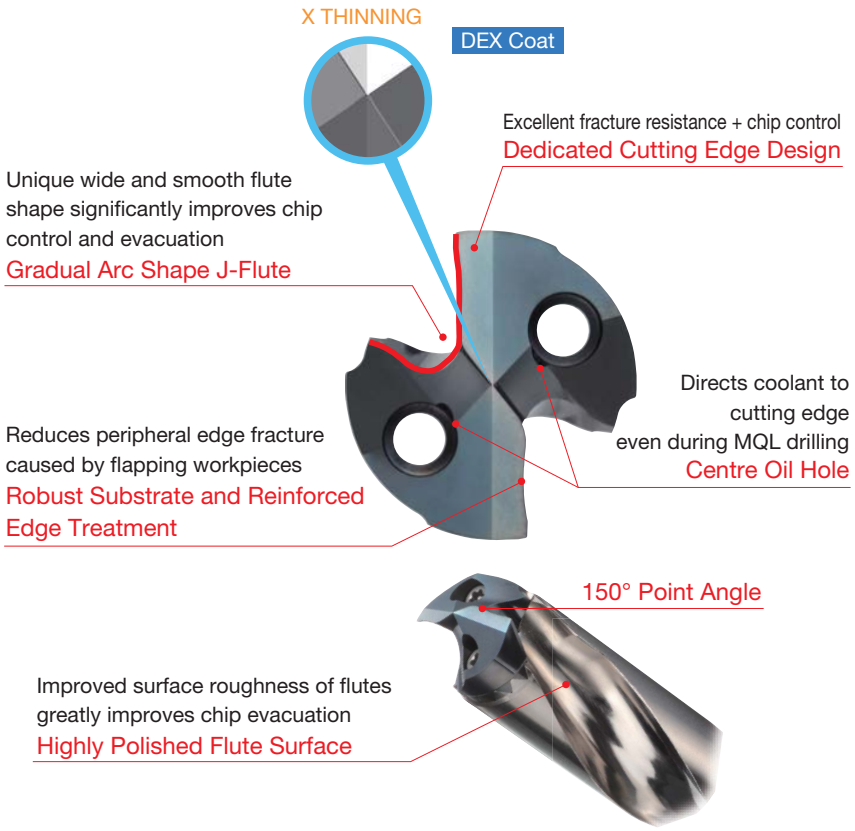
*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

Recommended Cutting Conditions J118

MFS type Head J119

SMD-MB type for Bridge

MB type Ideal for drilling rolled steels for welded structures for bridge (single layer and stacked)



Chip Control

MB type for Bridge — Good chip control

Work Material: SM490YB
Cutting Conditions: vc=87m/min, f=0.29mm/rev

Competitor's Product — Elongated chips

Work Material: SM490YB
Cutting Conditions: vc=87m/min, f=0.29mm/rev

Cutting Length Comparison for MB type

Case	Current Tool	Tool Life Comparison (Cutting Length)	Cutting Conditions
1	Competitor's Product A Indexable Head type	MB type 42m; Competitor's Product A 17m; 2.5x tool life	vc=46m/min f=0.35mm/rev Coolant: MQL
2	Competitor's Product B Indexable Head type	MB type 87m; Competitor's Product B 50m; 1.7x tool life	vc=56m/min f=0.30mm/rev Coolant: MQL
3	Competitor's Product C Brazed	MB type 95m; Competitor's Product C 32m; 3.0x tool life	vc=54m/min f=0.30mm/rev Coolant: MQL
4	Competitor's Product D Indexable Head type	MB type 120m; Competitor's Product D 70m; 1.7x tool life	vc=60m/min f=0.30mm/rev Coolant: MQL

1.7 to 3 times
the current tool life

Tool Cost

Major Potential Savings

Recommended Cutting Conditions (MB type)

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Work Material		Rolled Steel for Welded Structures SS400	Rolled Steel for Welded Structures SM490	Rolled Steel for Welded Structures SM520	Rolled Steel for Welded Structures SM570
Diameter DC (mm)	Cutting Conditions	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.	Min. - **Optimum** - Max.
ø24.7	n	900	840	700	700
	vc	60-**70**-80	55-**65**-75	45-**55**-65	45-**55**-65
	f	0.20-**0.30**-0.40	0.20-**0.30**-0.40	0.20-**0.25**-0.30	0.20-**0.25**-0.30
ø26.7	n	830	770	650	650
	vc	60-**70**-80	55-**65**-75	45-**55**-65	45-**55**-65
	f	0.20-**0.30**-0.40	0.20-**0.30**-0.40	0.20-**0.25**-0.30	0.20-**0.25**-0.30

SMD-MB type for Bridge (Internal Coolant Supply)

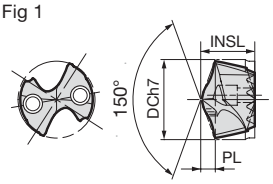
MB | Carbon Steel/Alloy Steel up to 0.28% | Carbon Steel/Alloy Steel from 0.29%

DEX Coat | Indexable head MB | Coolant Hole | Indexable | 3D

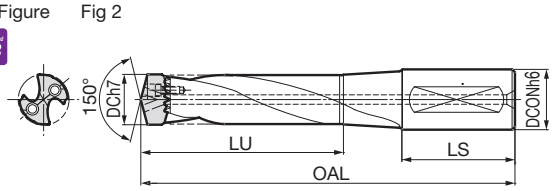
Only use the special MB type head with a B3 type holder.

*Refer to N36 for the tolerance of h6 and h7

Indexable Head Fig 1



● Set Figure Fig 2



Indexable Head MB type Diameter ø24.5/24.7mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
24.5	●	**SMDT 2450 MB**	14.1	3.3	**SMDH 240B3**	1
24.7	●	**SMDT 2470 MB**	14.1	3.3	**SMDH 240B3**	1

Grade: ACX80

Indexable Head MB type Diameter ø26.5/26.7mm

Dimensions (mm)

Diameter DC	Stock	Cat. No.	Head Length INSL	Tip PL	Applicable Holder	Fig
26.5	●	**SMDT 2650 MB**	15.3	3.6	**SMDH 260B3**	1
26.7	●	**SMDT 2670 MB**	15.3	3.6	**SMDH 260B3**	1

Grade: ACX80

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

Holder ø23.8 to 26.8mm with MB type set

Parts

Dimensions (mm)

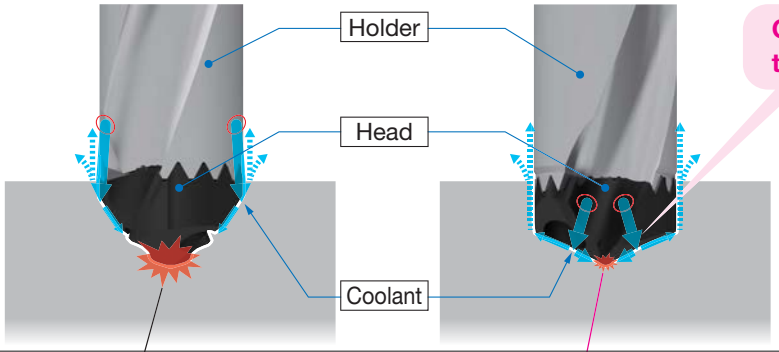
Diameter DC	Hole Depth (L/D)	Cat. No.	Stock	Effective Length LU	Overall Length OAL	Shank LS	Shank Dia. DCON	Indexable Head	Fig	Cap Screw	N·m	Wrench
23.8 < D ≤ 24.8	3	**SMDH 240B3**	●	90.3	173.3	60	32	MB	2	BXD03512IP	2.79 to 3.72	TRDR15IP
25.8 < D ≤ 26.8	3	**SMDH 260B3**	●	95.6	178.6	60	32	MB	2	BXD04014IP	4.14 to 5.52	TRDR20IP

Inquire about production of holders not listed in stock.

*Because the calculation method has been changed, the dimensions above (red text) are different from those listed in the 2021-2022 General Catalogue, but the specifications have not changed.

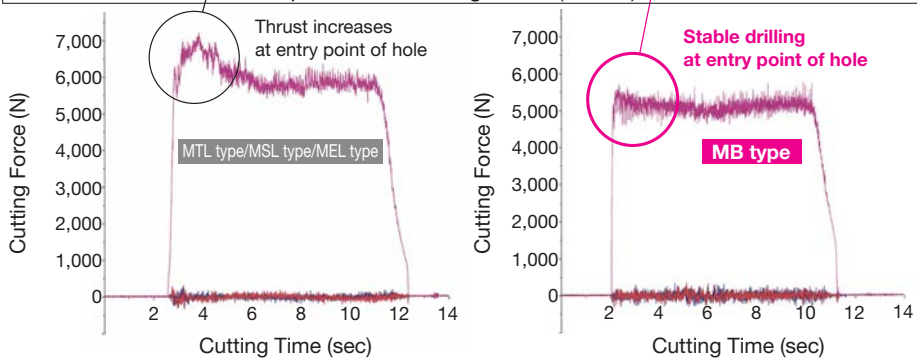
Coolant Supply for Improved Lubricity

MTL type/MSL type/MEL type | **MB type**



Coolant supply to the drill tip has been improved.

Comparison of Cutting Force (Thrust)



Work Material: SS400, Diameter: ø24.7mm, Cutting Conditions: vc = 70m/min, f = 0.35mm/rev, Coolant: MQL

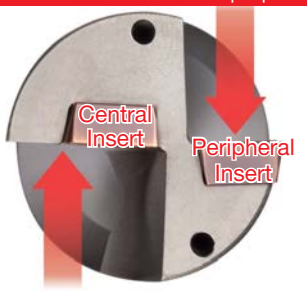
*Due to the difference in oil hole positions and flute shapes, MTL type / MSL type / MEL type drill heads are not compatible to use with B3 type drill holders (for bridge) and similarly, MB type drill heads (for bridge) are not compatible for use with -1.5D(F) to -12D type/M type/L type/D type drill holders.

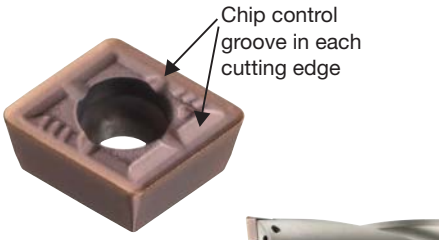
WDX series

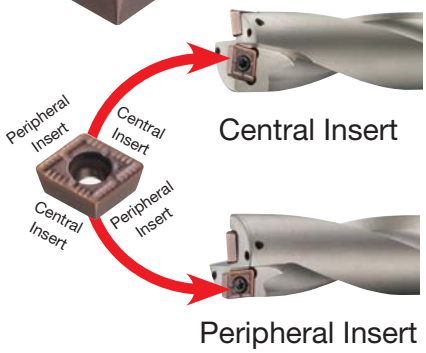
■ General Features

The SumiDrill WDX series has excellent cutting balance that provides stable drilling on a wide range of work materials from general steel to stainless steel and aluminum alloy.
Available in four original chipbreaker styles, the inserts feature improved chip evacuation and reduced cutting force for use in low-rigidity contexts.

Design
Cutting force of central insert ≈ that of peripheral insert







■ Features and Applications

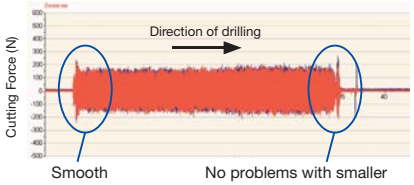
- **Balanced Design**
  Cutting force during drilling is balanced between central insert and peripheral insert. The relative position of each insert is optimised to provide stable drilling.
- **Excellent Chip Control**
  The chip evacuation direction can be controlled with the chip control groove at the centre of the breaker, enabling good chip evacuation.
- **Versatile Tool for a Variety of Drilling Applications**
  Select among four types of chipbreakers for different applications, allowing optimal drilling for a variety of work materials and conditions. Suitable for a wide range of applications including hole expansion, flat bottom drilling, external turning and internal boring.
- **Economical Four-Cornered Insert**
  This product has an extremely economical design where a single insert type can be used for the central insert or peripheral insert, with two corners for each position - a total of four corners.

Type	L type	G type		H type	M type
Features	For Low Feed with Chip Evacuation	General-purpose	For Non-Ferrous Metal	Strong Edged	Dedicated for Stainless Steel
Appearance					
Cross Section					

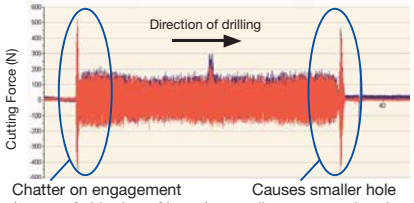
■ Cutting Performance

● Balanced Design (Comparison of Horizontal Component Values) Balance is maintained from the hole entry through to the hole exit for stable drilling.

WDX series



Conventional and Competitor's Products



● Improved chip control

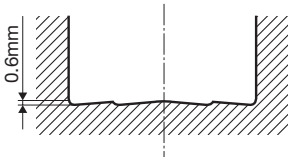
Tool : WDX 200D3S25 (ø20.0)
Work material : SUS304
Cutting Conditions: vc = 130m/min, f = 0.06mm/rev H = 50mm Wet

WDX series

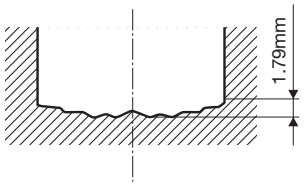
Conventional and Competitor's Products

● Finishing is easy because the hole bottom is almost flat.

Bottom of hole after drilling with WDX200D3S25



Bottom of hole after drilling with conventional tool (ø20)



M type Chipbreaker Dedicated for Stainless Steel Drilling + ACM300 Grade

■ Features

Newly developed M type chipbreaker dedicated for stainless steel drilling achieves stable hole quality through chip control.

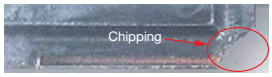
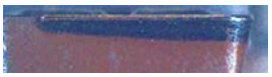
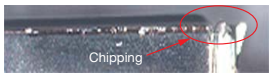
Tool	WDX series M type + ACM300	WDX series G type + ACP300	Competitor's Product Dedicated for Stainless Steel Drilling
Hole Quality			
Chip			

Tool: WDX200D3S25
Insert: WDXT063006-M (ACM300)
Work Material: SUS316L
Cutting Conditions: vc = 150m/min f = 0.08mm/rev
H = 60mm Wet

For High-speed Drilling of Steel and Cast Iron ACP100

■ Features

Our proprietary technology for "Super FF Coat", with its ultra-fine crystal grain structure and coating stress control technology, provides excellent wear resistance and high reliability.

		ACP100	Competitor's Product
Peripheral Insert	Rake Face		 Chipping
	Flank		 Chipping
Central Insert	Rake Face		Chipping
	Flank		Chipping

Tool: WDX250D3S25
Insert: WDXT063006-G (ACP100)
Work Material: S50C
Cutting Conditions: vc = 200m/min, f = 0.12mm/rev,
H = 50mm (through hole) Wet

Drills for Deep Hole Drilling L/D = 5 (In stock from ø13.0 to ø55.0mm)

■ Features

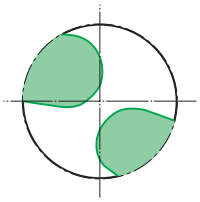
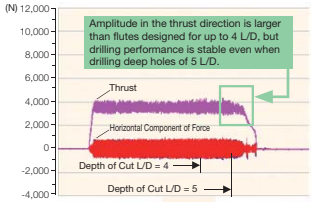
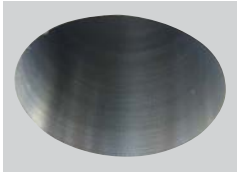
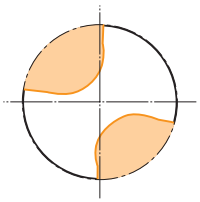
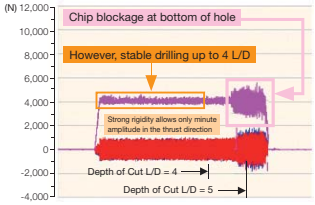
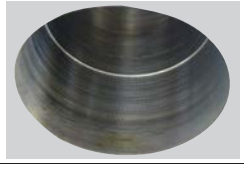
The SumiDrill WDX series for 5D drilling features a specially designed flute shape and large coolant hole for excellent chip evacuation even during deep hole drilling.

Large coolant hole

Coolant supply guide

Special Flute Shape for L/D=5

■ Performance

Tool Holder Features	Cross Section	Cutting Force	Drilled Hole Surface (Exit)
WDX 260D5S32 **Special Flute Shape for L/D=5** * Designed with emphasis on chip evacuation Expanded flute design improves chip evacuation for stable drilling performance even with holes up to 5 L/D.			Good drilled hole surface down to end of hole 
Comparison Tool **Flute Shape for L/D=4** * Designed with emphasis on drill rigidity Flute design enables greater rigidity of the drill, achieving stable drilling of shallow holes up to 4 L/D.			Poor drilled hole surface due to chip blockage at bottom of hole (near 5 L/D) 

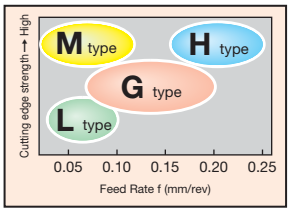
Work Material : SUS304 Tool: WDX260D5S32 Insert: WDXT 073506-G
Cutting Conditions : vc = 150m/min, f = 0.05mm/rev, H = 130mm (through hole) Wet

Insert Selection Guide —— The WDX insert series has a variety of options

5 grades

Work Material \ Grade	ACP100	ACP300	ACM300	ACK300	DL1500
P Steel (High-speed Drilling)	○				
P Steel (General Drilling)		○			
M Stainless Steel		○	○		
K Cast Iron (High-speed Drilling)	○				
K Cast Iron (General Drilling)				○	
N Non-Ferrous Metals					○

4 types of chipbreakers

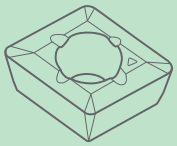


11 combinations are possible!

ACP100	ACP300	ACM300	ACK300	DL1500
P K L type	P L type		P K L type	
P K G type	P M G type		P K G type	N G type
P K H type	P H type		K H type	
		M M type		

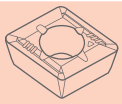
2nd Recommendation (P)

P Steel — For Low Feed with Chip Control — L type — ACP300



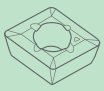
- For drilling of SS400, SCM415, SCM420, etc.
- High speed and low feed is recommended if there are issues with chip control
- Decrease the feed if vibration occurs due to burnt chips

P Steel — General-purpose — G type — ACP100



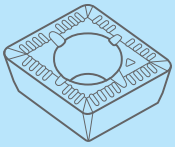
- For drilling of general steel and alloy steel, when prone to significantly large flank wear

P Steel — For Low Feed with Chip Control — L type — ACP100



- For low-feed conditions

P Steel — Strong Edged — H type — ACP300



- For drilling with interruptions (entry/exit) due to slanted entry, reduce the feed rate at the interrupted part (around f = 0.05mm/rev)
- For insufficient cutting edge strength due to drilling of hardened steel (heat treated)

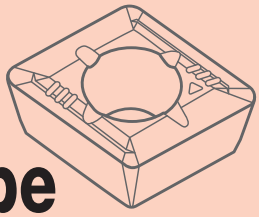
P Steel — Improved chip control (low carbon steel, etc.)

P Steel — Insufficient wear resistance

P Steel — Initial chipping measures (interruption, high hardness, etc.)

1st Recommendation (P M K N)

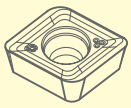
General-purpose — G type



- P Steel — For general steel and alloy steel drilling — ACP300
- K Cast Iron — For cast iron drilling — ACK300
- N Non-Ferrous Metal — For non-ferrous metal drilling — DL1500

M Stainless Steel — For stainless steel drilling — ACM300

Dedicated for Stainless Steel — M type



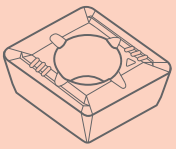
K Cast Iron — Insufficient wear resistance (high-speed drilling)

K Cast Iron — Initial chipping measures (interruption, high feed, etc.)

M Stainless Steel — Lack of chip evacuation (extension)

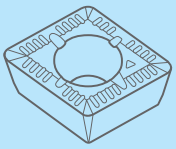
2nd Recommendation (M K)

K Cast Iron — General-purpose — G type — ACP100



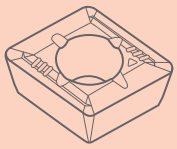
- When heavy flank wear occurs in cast iron drilling
- To limit wear in high-speed, low to medium feed conditions

K Cast Iron — Strong Edged — H type — ACK300



- When interrupted drilling is performed due to slanted entry, etc. as with steel drilling
- For insufficient cutting edge strength due to high-feed drilling

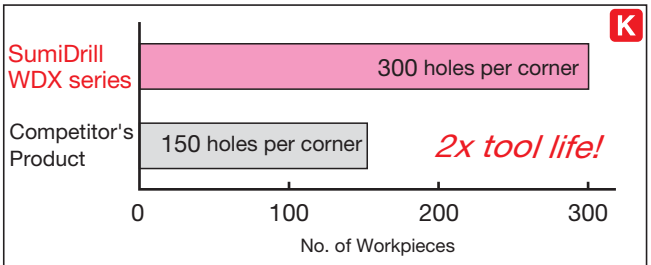
M Stainless Steel — General-purpose — G type — ACP300



- When chips extend and clog

*ACP100 is the first recommendation for steel with a hardness of 200HB or greater, or for high-speed drilling of steel.

■ Application Examples

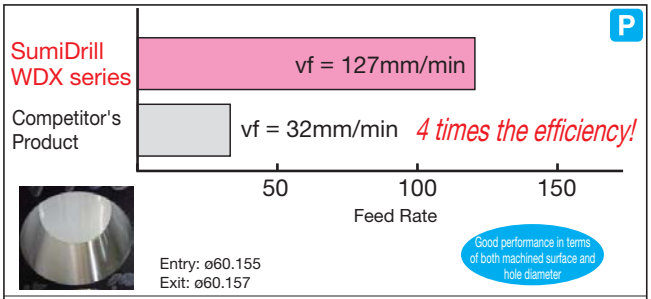


Work Material : Machine Component (FCD450)
Tool : WDX 205D3S25
Insert : WDXT 063006-G (ACK300)
Cutting Conditions : vc = 122m/min, f = 0.15mm/rev, H = 33mm Through Wet

· Significant increase in tool life: twice that of conventional tools.
· Stable drilling with minimal cutting force.

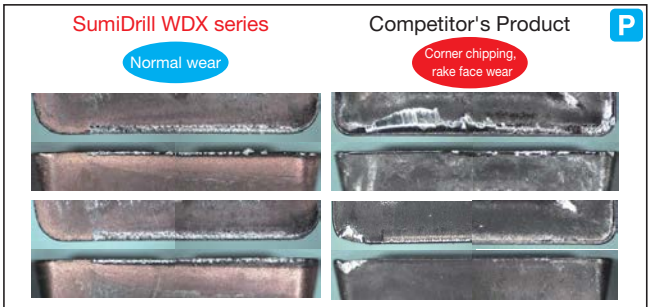
Work Material : Machine Component (SCM440)
Tool : WDX 200D3S25, Insert: WDXT 063006-G (ACP300)
Cutting Conditions : vc = 157m/min, f = 0.19mm/rev, H = 19mm, through, Wet
(Competitor's Product : vc = 157m/min, f = 0.15mm/rev, H = 19mm Through Wet)

Good chip control even in high-efficiency conditions. Good stability with low vibration during drilling. 25% greater efficiency and 20% longer tool life.



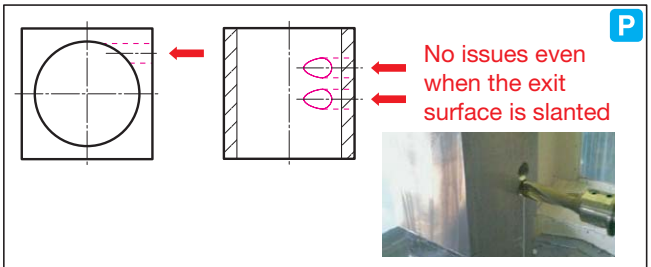
Work Material : Plate (S48C)
Tool : WDX 600D3S40
Insert : WDXT 186012-G (ACP300)
Cutting Conditions : vc = 150m/min, f = 0.16mm/rev, H = 60mm, through, Wet
(Conventional Tool : vc = 30m/min, f = 0.20mm/rev, H = 60mm Through Wet)

· Achieves steady drilling even at large diameters
· Achieves 4 times the efficiency of conventional tools



Work Material : Tractor Links (35MnBM)
Tool : WDX 205D5S25
Insert : WDXT 063006-G (ACP300)
Cutting Conditions : vc = 100m/min, f = 0.11mm/rev, H = 60mm Through Wet

· Achieves steady drilling even at L/D=5
· Reduces insert chipping and wear for stable tool life

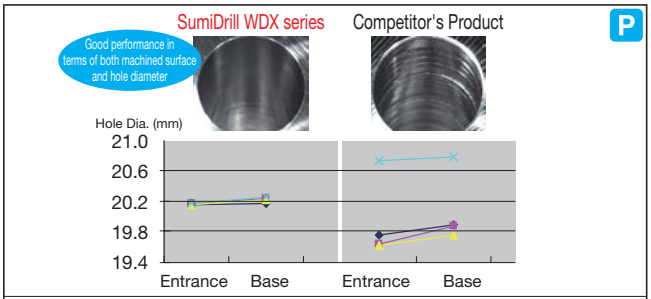


Work Material : Plate (S15C)
Tool : WDX 430D3S40, Insert: WDXT 125012-H (ACP300)
Cutting Conditions : vc = 136m/min, f = 0.15mm/rev, H = 60+50mm (Semicircle Area) Through Wet

· Enables stable drilling even in unstable cutting conditions (interrupted drilling at deepest point).
· Quieter drilling than conventional tools.

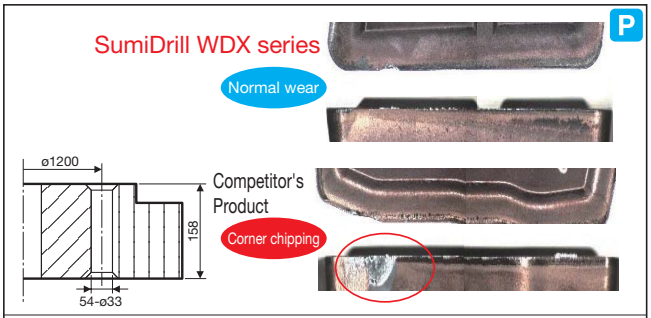
Work Material : Piping Component (SUS304)
Tool : WDX210D3S25 Insert: WDXT063006-M (ACM300)
Cutting Conditions : vc = 105mm/min, f = 0.08mm/rev, H = 34mm Wet

· Enables improved chip evacuation and stable drilling.



Work Material : Machine Component (SCM415)
Tool : WDX 200D5S25
Insert : WDXT 063006-G (ACP300)
Cutting Conditions : vc = 185m/min, f = 0.12mm/rev, H = 87mm, through, Wet

· Good machined surface
· Consistent drilled diameter



Work Material : Bearing for Wind Power Generator (42CrMo)
Tool : WDX330D5S40
Insert : WDXT094008-L (ACP300)
Cutting Conditions : vc = 146m/min, f = 0.10mm/rev, H = 158mm Through Wet

· Eliminates defects in workpieces caused by insert chipping

WDX series for 2D (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

CVD Coat | PVD Coat | AURORA Coat DLC | Coolant Hole | 2D | Indexable

Drilling tolerance: -0.05 to +0.15mm

*Refer to N36 for the tolerance of h7

Fig 1

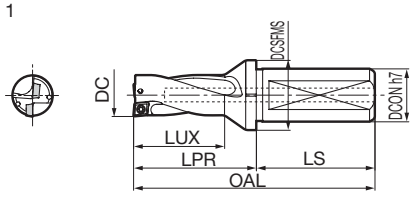


Fig 2

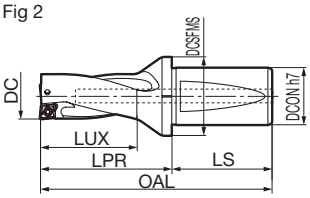
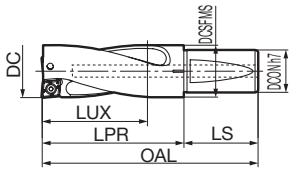


Fig 3



Diameter ø13.0 to 45.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
13.0	●	WDX 130D2S20	29	44	88	44	28.0	20	0.35	WDXT 042004	1
13.5	●	135D2S20	30	45	89	44	28.0	20	0.30		1
14.0	●	140D2S20	31	46	90	44	28.0	20	0.25		1
14.5	●	145D2S20	32	47	91	44	28.0	20	0.20		1
15.0	●	150D2S20	33	48	92	44	28.0	20	0.15		1
15.5	●	WDX 155D2S20	34	49	93	44	30.0	20	0.40	WDXT 052504	1
16.0	●	160D2S20	35	50	94	44	30.0	20			1
16.5	●	165D2S20	36	51	95	44	30.0	20	0.35		1
17.0	●	170D2S20	37	52	96	44	30.0	20	0.30		1
17.5	●	WDX 175D2S25	38	53	109	56	32.0	25	0.25		1
18.0	●	180D2S25	39	54	110	56	32.0	25	0.20		1
18.5	●	WDX 185D2S25	40	55	111	56	33.0	25	0.50	WDXT 063006	1
19.0	●	190D2S25	41	56	112	56	33.0	25	0.45		1
19.5	●	195D2S25	42	57	113	56	33.0	25	0.40		1
20.0	●	200D2S25	43	58	114	56	33.0	25	0.30		1
20.5	●	205D2S25	44	59	115	56	33.0	25			1
21.0	●	210D2S25	45	60	116	56	33.0	25	0.20		1
21.5	●	215D2S25	46	61	117	56	33.0	25	0.15		1
22.0	●	220D2S25	47	62	118	56	33.0	25	0.10		1
22.5	●	225D2S25	48	63	119	56	33.0	25	0.05		1
23.0	●	WDX 230D2S25	49	67	123	56	37.0	25	0.70	WDXT 073506	1
23.5	●	235D2S25	50	68	124	56	37.0	25			1
24.0	●	240D2S25	51	69	125	56	37.0	25	0.60		1
24.5	●	245D2S25	52	70	126	56	37.0	25	0.50		1
25.0	●	250D2S25	53	71	127	56	37.0	25			1
25.5	●	WDX 255D2S32	54	74	134	60	41.0	32	0.45		2
26.0	●	260D2S32	55	75	135	60	41.0	32	0.40		2
26.5	●	265D2S32	56	76	136	60	41.0	32	0.35		2
27.0	●	270D2S32	57	77	137	60	41.0	32	0.25		2
27.5	●	275D2S32	58	78	138	60	41.0	32	0.20		2
28.0	●	280D2S32	59	79	139	60	41.0	32	0.15		2
28.5	●	285D2S32	60	80	140	60	41.0	32	0.10		2
29.0	●	WDX 290D2S32	62	83	143	60	50.0	32	1.00	WDXT 094008	2
29.5	●	295D2S32	63	84	144	60	50.0	32	0.95		2
30.0*	●	300D2S32	64	88	148	60	54.0	32	0.90		2
31.0*	●	310D2S32	66	90	150	60	54.0	32	0.80		2
32.0*	●	320D2S32	68	92	152	60	54.0	32	0.70		2
30.0*	●	WDX 300D2S40	64	88	158	70	54.0	40	0.90		2
31.0*	●	310D2S40	66	90	160	70	54.0	40	0.80		2
32.0*	●	320D2S40	68	92	162	70	54.0	40	0.70		2
33.0	●	330D2S40	70	94	164	70	54.0	40	0.55		2
34.0	●	340D2S40	72	96	166	70	54.0	40	0.45		2
35.0	●	350D2S40	74	98	168	70	54.0	40	0.35		2
36.0	●	360D2S40	76	100	170	70	54.0	40	0.20		2
37.0	●	WDX 370D2S40	79	109	179	70	49.5	40	1.00	WDXT 125012	2
38.0	●	380D2S40	81	111	181	70	49.5	40			2
39.0	●	390D2S40	83	113	183	70	49.5	40	0.90		2
40.0	●	400D2S40	85	115	185	70	49.5	40	0.80		2
41.0	●	410D2S40	87	117	187	70	49.5	40	0.70		2
42.0	●	420D2S40	89	119	189	70	49.5	40	0.60		2
43.0	●	430D2S40	91	121	191	70	49.5	40	0.50		2
44.0	●	440D2S40	93	123	193	70	49.5	40			2
45.0	●	450D2S40	95	125	195	70	49.5	40	0.40		2

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Radial Offset Amount J140

Diameter ø46.0 to 68.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
46.0	●	WDX 460D2S40	97	127	197	70	49.5	40	1.50	WDXT 156012	2
47.0	●	470D2S40	99	129	199	70	49.5	40	1.40		2
48.0	●	480D2S40	101	131	201	70	49.5	40	1.30		2
49.0	●	490D2S40	103	133	203	70	49.5	40	1.20		2
50.0	●	500D2S40	105	135	205	70	49.5	40	1.10		2
51.0	●	510D2S40	107	137	207	70	49.5	40	1.00		3
52.0	●	520D2S40	109	139	209	70	50.5	40	0.90		3
53.0	●	530D2S40	111	141	211	70	51.5	40	0.80		3
54.0	●	540D2S40	113	143	213	70	52.5	40	0.60		3
55.0	●	550D2S40	115	145	215	70	53.5	40	0.50		3
56.0	●	WDX 560D2S40	120	152	222	70	54.0	40	2.00	WDXT 186012	3
57.0	●	570D2S40	122	154	224	70	55.0	40	1.80		3
58.0	●	580D2S40	124	156	226	70	56.0	40	1.70		3
59.0	●	590D2S40	126	158	228	70	57.0	40	1.60		3
60.0	●	600D2S40	128	160	230	70	58.0	40	1.50		3
61.0	●	610D2S40	130	162	232	70	59.0	40	1.40		3
62.0	●	620D2S40	132	164	234	70	60.0	40	1.30		3
63.0	●	630D2S40	134	166	236	70	61.0	40	1.20		3
64.0	●	640D2S40	136	168	238	70	62.0	40	1.00		3
65.0	●	650D2S40	138	170	240	70	63.0	40	0.90		3
66.0	●	660D2S40	140	172	242	70	64.0	40	0.70		3
67.0	●	670D2S40	142	174	244	70	65.0	40	0.60		3
68.0	●	680D2S40	144	176	246	70	66.0	40	0.50		3

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Parts

Applicable Holder	Flat Insert Screw	N·m	Wrench	Wrench
WDX130D2S20 to WDX150D2S20	BFTX01604N	0.3	TRX06	-
WDX155D2S20 to WDX180D2S25	BFTX0204N	0.5	TRX06	-
WDX185D2S25 to WDX225D2S25	BFTY02206	1.0	-	TRD07
WDX230D2S25 to WDX285D2S32	BFTX02506N	1.5	-	TRD08
WDX290D2S32 to WDX360D2S40	BFTX03584	3.5	-	TRD15
WDX370D2S40 to WDX450D2S40	BFTX0511N	5.0	-	TRD20
WDX460D2S40 to WDX680D2S40	BFTX0615N	5.0	-	TRD25

Identification Code

WDX 200 D2 S25

- 200: Dia. DC (ø20.0)
- D2: Flute Length (L/D) (2D)
- S25: Shank Dia. DCON (ø25.0)

N·m Recommended Tightening Torque (N·m)

WDX series for 2D (Internal Coolant Supply)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	P K				N
	General-purpose		P	M		
	Roughing		P		K	

Cat. No.	ACP100	ACP300	ACM300	ACK300	DL1500	Fig	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holders
WDXT 042004-L	●	●		●		1	4.2	2.0	0.4	0.4	WDX130D2S20 to WDX150D2S20
042004-G	●	●		●	●	2	4.2	2.0	0.4	0.4	
042004-H	●	●		●		3	4.2	2.0	0.4	0.4	
042004-M			●			4	4.2	2.0	0.4	0.8	
WDXT 052504-L	●	●		●		1	5.0	2.5	0.4	0.4	WDX155D2S20 to WDX180D2S25
052504-G	●	●		●	●	2	5.0	2.5	0.4	0.4	
052504-H	●	●		●		3	5.0	2.5	0.4	0.4	
052504-M			●			4	5.0	2.5	0.4	1.0	
WDXT 063006-L	●	●		●		1	6.0	3.0	0.6	0.6	WDX185D2S25 to WDX225D2S25
063006-G	●	●		●	●	2	6.0	3.0	0.6	0.6	
063006-H	●	●		●		3	6.0	3.0	0.6	0.6	
063006-M			●			4	6.0	3.0	0.6	1.4	
WDXT 073506-L	●	●		●		1	7.5	3.5	0.6	0.6	WDX230D2S25 to WDX285D2S32
073506-G	●	●		●	●	2	7.5	3.5	0.6	0.6	
073506-H	●	●		●		3	7.5	3.5	0.6	0.6	
073506-M			●			4	7.5	3.5	0.6	1.6	
WDXT 094008-L	●	●		●		1	9.6	4.0	0.8	0.8	WDX290D2S32 to WDX360D2S40
094008-G	●	●		●	●	2	9.6	4.0	0.8	0.8	
094008-H	●	●		●		3	9.6	4.0	0.8	0.8	
094008-M			●			4	9.6	4.0	0.8	2.4	
WDXT 125012-L	●	●		●		1	12.4	5.0	1.2	1.2	WDX370D2S40 to WDX450D2S40
125012-G	●	●		●	●	2	12.4	5.0	1.2	1.2	
125012-H	●	●		●		3	12.4	5.0	1.2	1.2	
125012-M			●			4	12.4	5.0	1.2	3.2	
WDXT 156012-L	●	●		●		1	15.2	6.0	1.2	1.2	WDX460D2S40 to WDX550D2S40
156012-G	●	●		●	●	2	15.2	6.0	1.2	1.2	
156012-H	●	●		●		3	15.2	6.0	1.2	1.2	
WDXT 186012-L	●	●		●		1	18.0	6.0	1.2	1.2	WDX560D2S40 to WDX680D2S40
186012-G	●	●		●		2	18.0	6.0	1.2	1.2	
186012-H	●	●		●		3	18.0	6.0	1.2	1.2	

Fig 1 For low feed with chip control

L type

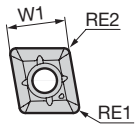


Fig 2 General-purpose

G type

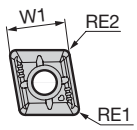


Fig 3 Strong edged

H type

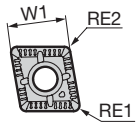
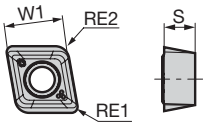


Fig 4 Dedicated for stainless steel

M type



Identification Code

WDXT 06 30 06 -G

- 06: Width across Flats (6.0)
- 30: Thickness x 10 (3.0)
- 06: Corner Radius x 10 (0.6)
- -G: Breaker type

Recommended Cutting Conditions (for 2D)

		Work Material		Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f feed rate (mm/rev) (Min. - **Optimum** - Max.) ø13.0 to ø18.0	ø18.5 to ø29.0	ø29.5 to ø36.0	ø37.0 to ø55.0	ø56.0 to ø68.0
2D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-**180**-240	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.05-**0.08**-0.12	0.06-**0.09**-0.13
			S15C	125	L	ACP300	130-**170**-220	0.04-**0.08**-0.12	0.04-**0.08**-0.12	0.04-**0.08**-0.13	0.05-**0.10**-0.15	0.06-**0.11**-0.17
			S45C	190	G	ACP300	100-**150**-200	0.08-**0.13**-0.24	0.08-**0.13**-0.24	0.08-**0.14**-0.26	0.09-**0.16**-0.29	0.10-**0.17**-0.32
			S45C Hardened	250	G	ACP100	100-**170**-240	0.05-**0.09**-0.14	0.05-**0.09**-0.14	0.05-**0.09**-0.14	0.05-**0.10**-0.17	0.06-**0.11**-0.18
			S75C	270	G	ACP100	120-**180**-240	0.06-**0.10**-0.17	0.06-**0.10**-0.17	0.06-**0.10**-0.17	0.07-**0.12**-0.19	0.08-**0.13**-0.21
			S75C Hardened	300	G	ACP100	85-**150**-210	0.05-**0.09**-0.14	0.05-**0.09**-0.14	0.05-**0.09**-0.14	0.05-**0.10**-0.15	0.06-**0.11**-0.17
		Low-alloy Steel	SCM,SNCM	180	L	ACP300	100-**140**-180	0.05-**0.08**-0.14	0.05-**0.08**-0.14	0.05-**0.08**-0.16	0.06-**0.09**-0.17	0.07-**0.10**-0.19
			SCM, SNCM Hardened	275	G	ACP100	100-**170**-240	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.07-**0.11**-0.16	0.08-**0.11**-0.17
			SCM, SNCM Hardened	300	G	ACP100	90-**150**-210	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.07-**0.11**-0.16	0.08-**0.11**-0.17
			SCM, SNCM Hardened	350	G	ACP100	75-**120**-165	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.07-**0.11**-0.16	0.08-**0.11**-0.17
		High-alloy Steel	SKD,SKT,SKH	200	G	ACP100	120-**180**-240	0.08-**0.12**-0.17	0.08-**0.12**-0.17	0.08-**0.12**-0.18	0.09-**0.12**-0.21	0.10-**0.13**-0.22
			SKD, SKT, SKH (Sintered)	325	G	ACP100	100-**140**-180	0.06-**0.10**-0.15	0.06-**0.10**-0.15	0.06-**0.11**-0.15	0.07-**0.11**-0.16	0.08-**0.11**-0.17
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACM300	120-**150**-180	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.07-**0.10**-0.16	0.08-**0.12**-0.16
			SUS403/Others (Martensitic (hardened))	240	M	ACM300	90-**120**-150	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.07-**0.10**-0.16	0.08-**0.12**-0.16
			SUS304, SUS316 (Austenitic)	180	M	ACM300	120-**150**-180	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.07-**0.10**-0.16	0.08-**0.12**-0.16
	K	Cast Iron			H	ACK300	120-**160**-200	0.09-**0.20**-0.32	0.10-**0.22**-0.36	0.11-**0.24**-0.39	0.12-**0.26**-0.44	0.13-**0.29**-0.48
		Ductile Cast Iron			H	ACK300	90-**120**-150	0.09-**0.20**-0.32	0.10-**0.22**-0.36	0.11-**0.24**-0.39	0.12-**0.26**-0.44	0.13-**0.29**-0.48
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		200	G	ACP300	25-**50**-70	0.06-**0.11**-0.18	0.06-**0.11**-0.18	0.06-**0.12**-0.19	0.07-**0.13**-0.22	0.08-**0.14**-0.24
	N	Aluminum Alloy			G	DL1500	200-**260**-320	0.06-**0.11**-0.17	0.06-**0.11**-0.17	0.06-**0.12**-0.18	0.07-**0.13**-0.20	0.08-**0.14**-0.22
		Copper Alloy			G	DL1500	180-**230**-280	0.06-**0.11**-0.17	0.06-**0.11**-0.17	0.06-**0.12**-0.18	0.07-**0.13**-0.20	0.08-**0.14**-0.22

For the P and K grades for which ACP300 and ACK300 inserts are the first recommendation, ACP100 inserts are the second recommendation.
In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

WDX series for 3D (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

CVD Coat | PVD Coat | AURORA Coat DLC | Coolant Hole | 3D | Indexable

Drilling tolerance: 0 to +0.20mm

*Refer to N36 for the tolerance of h7

Fig 1

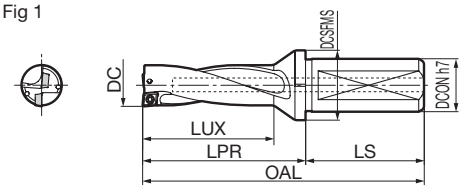


Fig 2

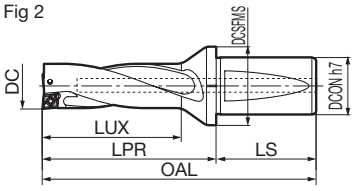
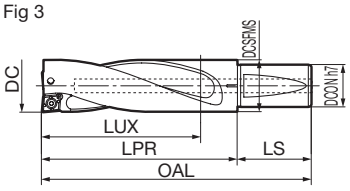


Fig 3



Diameter ø13.0 to 45.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
13.0	●	WDX 130D3S20	42.0	57.0	101.0	44	28.0	20	0.35	WDXT 042004	1
13.5	●	135D3S20	43.5	58.5	102.5	44	28.0	20	0.30		1
14.0	●	140D3S20	45.0	60.0	104.0	44	28.0	20	0.25		1
14.5	●	145D3S20	46.5	61.5	105.5	44	28.0	20	0.20		1
15.0	●	150D3S20	48.0	63.0	107.0	44	28.0	20	0.15		1
15.5	●	WDX 155D3S20	49.5	64.5	108.5	44	30.0	20	0.40	WDXT 052504	1
16.0	●	160D3S20	51.0	66.0	110.0	44	30.0	20			1
16.5	●	165D3S20	52.5	67.5	111.5	44	30.0	20	0.35		1
17.0	●	170D3S20	54.0	69.0	113.0	44	30.0	20	0.30		1
17.5	●	WDX 175D3S25	55.5	70.5	126.5	56	32.0	25	0.25		1
18.0	●	180D3S25	57.0	72.0	128.0	56	32.0	25	0.20		1
18.5	●	WDX 185D3S25	58.5	73.5	129.5	56	33.0	25	0.50	WDXT 063006	1
19.0	●	190D3S25	60.0	75.0	131.0	56	33.0	25	0.45		1
19.5	●	195D3S25	61.5	76.5	132.5	56	33.0	25	0.40		1
20.0	●	200D3S25	63.0	78.0	134.0	56	33.0	25	0.30		1
20.5	●	205D3S25	64.5	79.5	135.5	56	33.0	25			1
21.0	●	210D3S25	66.0	81.0	137.0	56	33.0	25	0.20		1
21.5	●	215D3S25	67.5	82.5	138.5	56	33.0	25	0.15		1
22.0	●	220D3S25	69.0	84.0	140.0	56	33.0	25	0.10		1
22.5	●	225D3S25	70.5	85.5	141.5	56	33.0	25	0.05		1
23.0	●	WDX 230D3S25	72.0	90.0	146.0	56	37.0	25	0.70	WDXT 073506	1
23.5	●	235D3S25	73.5	91.5	147.5	56	37.0	25			1
24.0	●	240D3S25	75.0	93.0	149.0	56	37.0	25	0.60		1
24.5	●	245D3S25	76.5	94.5	150.5	56	37.0	25	0.50		1
25.0	●	250D3S25	78.0	96.0	152.0	56	37.0	25			1
25.5	●	WDX 255D3S32	79.5	99.5	159.5	60	41.0	32	0.45		2
26.0	●	260D3S32	81.0	101.0	161.0	60	41.0	32	0.40		2
26.5	●	265D3S32	82.5	102.5	162.5	60	41.0	32	0.35		2
27.0	●	270D3S32	84.0	104.0	164.0	60	41.0	32	0.25		2
27.5	●	275D3S32	85.5	105.5	165.5	60	41.0	32	0.20		2
28.0	●	280D3S32	87.0	107.0	167.0	60	41.0	32	0.15		2
28.5	●	285D3S32	88.5	108.5	168.5	60	41.0	32	0.10		2
29.0	●	WDX 290D3S32	91.0	112.0	172.0	60	50.0	32	1.00	WDXT 094008	2
29.5	●	295D3S32	92.5	113.5	173.5	60	50.0	32	0.95		2
30.0*	●	300D3S32	94.0	118.0	178.0	60	54.0	32	0.90		2
31.0*	●	310D3S32	97.0	121.0	181.0	60	54.0	32	0.80		2
32.0*	●	320D3S32	100.0	124.0	184.0	60	54.0	32	0.70		2
30.0*	●	WDX 300D3S40	94.0	118.0	188.0	70	54.0	40	0.90		2
31.0*	●	310D3S40	97.0	121.0	191.0	70	54.0	40	0.80		2
32.0*	●	320D3S40	100.0	124.0	194.0	70	54.0	40	0.70		2
33.0	●	330D3S40	103.0	127.0	197.0	70	54.0	40	0.55		2
34.0	●	340D3S40	106.0	130.0	200.0	70	54.0	40	0.45		2
35.0	●	350D3S40	109.0	133.0	203.0	70	54.0	40	0.35		2
36.0	●	360D3S40	112.0	136.0	206.0	70	54.0	40	0.20		2
37.0	●	WDX 370D3S40	116.0	146.0	216.0	70	49.5	40	1.00	WDXT 125012	2
38.0	●	380D3S40	119.0	149.0	219.0	70	49.5	40			2
39.0	●	390D3S40	122.0	152.0	222.0	70	49.5	40	0.90		2
40.0	●	400D3S40	125.0	155.0	225.0	70	49.5	40	0.80		2
41.0	●	410D3S40	128.0	158.0	228.0	70	49.5	40	0.70		2
42.0	●	420D3S40	131.0	161.0	231.0	70	49.5	40	0.60		2
43.0	●	430D3S40	134.0	164.0	234.0	70	49.5	40	0.50		2
44.0	●	440D3S40	137.0	167.0	237.0	70	49.5	40			2
45.0	●	450D3S40	140.0	170.0	240.0	70	49.5	40	0.40		2

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Radial Offset Amount J140

Diameter ø46.0 to 68.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
46.0	●	WDX 460D3S40	143.0	173.0	243.0	70	49.5	40	1.50	WDXT 156012	2
47.0	●	470D3S40	146.0	176.0	246.0	70	49.5	40	1.40		2
48.0	●	480D3S40	149.0	179.0	249.0	70	49.5	40	1.30		2
49.0	●	490D3S40	152.0	182.0	252.0	70	49.5	40	1.20		2
50.0	●	500D3S40	155.0	185.0	255.0	70	49.5	40	1.10		2
51.0	●	510D3S40	158.0	188.0	258.0	70	49.5	40	1.00		3
52.0	●	520D3S40	161.0	191.0	261.0	70	50.5	40	0.90		3
53.0	●	530D3S40	164.0	194.0	264.0	70	51.5	40	0.80		3
54.0	●	540D3S40	167.0	197.0	267.0	70	52.5	40	0.60		3
55.0	●	550D3S40	170.0	200.0	270.0	70	53.5	40	0.50		3
56.0	●	WDX 560D3S40	176.0	208.0	278.0	70	54.0	40	2.00	WDXT 186012	3
57.0	●	570D3S40	179.0	211.0	281.0	70	55.0	40	1.80		3
58.0	●	580D3S40	182.0	214.0	284.0	70	56.0	40	1.70		3
59.0	●	590D3S40	185.0	217.0	287.0	70	57.0	40	1.60		3
60.0	●	600D3S40	188.0	220.0	290.0	70	58.0	40	1.50		3
61.0	●	610D3S40	191.0	223.0	293.0	70	59.0	40	1.40		3
62.0	●	620D3S40	194.0	226.0	296.0	70	60.0	40	1.30		3
63.0	●	630D3S40	197.0	229.0	299.0	70	61.0	40	1.20		3
64.0	●	640D3S40	200.0	232.0	302.0	70	62.0	40	1.00		3
65.0	●	650D3S40	203.0	235.0	305.0	70	63.0	40	0.90		3
66.0	●	660D3S40	206.0	238.0	308.0	70	64.0	40	0.70		3
67.0	●	670D3S40	209.0	241.0	311.0	70	65.0	40	0.60		3
68.0	●	680D3S40	212.0	244.0	314.0	70	66.0	40	0.50		3

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Parts

Applicable Holders	Flat Insert Screw	N·m	Wrench	Wrench
WDX130D3S20 to WDX150D3S20	BFTX01604N	0.3	TRX06	-
WDX155D3S20 to WDX180D3S25	BFTX0204N	0.5	TRX06	-
WDX185D3S25 to WDX225D3S25	BFTY02206	1.0	-	TRD07
WDX230D3S25 to WDX285D3S32	BFTX02506N	1.5	-	TRD08
WDX290D3S32 to WDX360D3S40	BFTX03584	3.5	-	TRD15
WDX370D3S40 to WDX450D3S40	BFTX0511N	5.0	-	TRD20
WDX460D3S40 to WDX680D3S40	BFTX0615N	5.0	-	TRD25

Identification Code

WDX 200 D3 S25

- WDX: Dia. DC (ø20.0)
- D3: Flute Length (L/D) (3D)
- S25: Shank Dia. DCON (ø25.0)

N·m Recommended Tightening Torque (N·m)

WDX series for 3D (Internal Coolant Supply)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	P K				N
	General-purpose		P	M		
	Roughing		P		K	

Cat. No.	ACP100	ACP300	ACM300	ACK300	DL1500	Fig	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holders
WDXT 042004-L	●	●		●		1	4.2	2.0	0.4	0.4	WDX130D3S20 to WDX150D3S20
042004-G	●	●		●	●	2	4.2	2.0	0.4	0.4	
042004-H	●	●		●		3	4.2	2.0	0.4	0.4	
042004-M			●			4	4.2	2.0	0.4	0.8	
WDXT 052504-L	●	●		●		1	5.0	2.5	0.4	0.4	WDX155D3S20 to WDX180D3S25
052504-G	●	●		●	●	2	5.0	2.5	0.4	0.4	
052504-H	●	●		●		3	5.0	2.5	0.4	0.4	
052504-M			●			4	5.0	2.5	0.4	1.0	
WDXT 063006-L	●	●		●		1	6.0	3.0	0.6	0.6	WDX185D3S25 to WDX225D3S25
063006-G	●	●		●	●	2	6.0	3.0	0.6	0.6	
063006-H	●	●		●		3	6.0	3.0	0.6	0.6	
063006-M			●			4	6.0	3.0	0.6	1.4	
WDXT 073506-L	●	●		●		1	7.5	3.5	0.6	0.6	WDX230D3S25 to WDX285D3S32
073506-G	●	●		●	●	2	7.5	3.5	0.6	0.6	
073506-H	●	●		●		3	7.5	3.5	0.6	0.6	
073506-M			●			4	7.5	3.5	0.6	1.6	
WDXT 094008-L	●	●		●		1	9.6	4.0	0.8	0.8	WDX290D3S32 to WDX360D3S40
094008-G	●	●		●	●	2	9.6	4.0	0.8	0.8	
094008-H	●	●		●		3	9.6	4.0	0.8	0.8	
094008-M			●			4	9.6	4.0	0.8	2.4	
WDXT 125012-L	●	●		●		1	12.4	5.0	1.2	1.2	WDX370D3S40 to WDX450D3S40
125012-G	●	●		●	●	2	12.4	5.0	1.2	1.2	
125012-H	●	●		●		3	12.4	5.0	1.2	1.2	
125012-M			●			4	12.4	5.0	1.2	3.2	
WDXT 156012-L	●	●		●		1	15.2	6.0	1.2	1.2	WDX460D3S40 to WDX550D3S40
156012-G	●	●		●	●	2	15.2	6.0	1.2	1.2	
156012-H	●	●		●		3	15.2	6.0	1.2	1.2	
WDXT 186012-L	●	●		●		1	18.0	6.0	1.2	1.2	WDX560D3S40 to WDX680D3S40
186012-G	●	●		●		2	18.0	6.0	1.2	1.2	
186012-H	●	●		●		3	18.0	6.0	1.2	1.2	

Fig 1 For low feed with chip control

L type

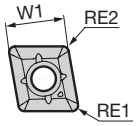


Fig 2 General-purpose

G type

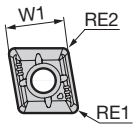


Fig 3 Strong edged

H type

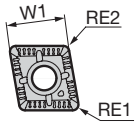
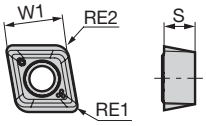


Fig 4 Dedicated for stainless steel

M type



Identification Code

WDXT 06 30 06 -G

- 06: Width across Flats (6.0)
- 30: Thickness x 10 (3.0)
- 06: Corner Radius x 10 (0.6)
- -G: Breaker type

Recommended Cutting Conditions (for 3D)

		Work Material		Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f feed rate (mm/rev) (Min. - **Optimum** - Max.) ø13.0 to ø18.0	ø18.5 to ø29.0	ø29.5 to ø36.0	ø37.0 to ø55.0	ø56.0 to ø68.0
3D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-**180**-240	0.05-**0.07**-0.10	0.05-**0.07**-0.10	0.05-**0.08**-0.11	0.05-**0.08**-0.12	0.06-**0.09**-0.13
			S15C	125	L	ACP300	130-**170**-220	0.04-**0.07**-0.10	0.04-**0.07**-0.10	0.04-**0.08**-0.11	0.05-**0.09**-0.12	0.06-**0.10**-0.13
			S45C	190	G	ACP300	100-**150**-200	0.08-**0.12**-0.20	0.08-**0.12**-0.20	0.08-**0.13**-0.22	0.09-**0.14**-0.24	0.10-**0.16**-0.27
			S45C Hardened	250	G	ACP100	100-**170**-240	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.05-**0.08**-0.12	0.05-**0.09**-0.14	0.06-**0.10**-0.15
			S75C	270	G	ACP100	120-**180**-240	0.06-**0.09**-0.14	0.06-**0.09**-0.14	0.06-**0.10**-0.14	0.07-**0.11**-0.17	0.08-**0.12**-0.18
			S75C Hardened	300	G	ACP100	85-**150**-210	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.05-**0.09**-0.14	0.06-**0.10**-0.14
		Low-alloy Steel	SCM,SNCM	180	L	ACP300	100-**140**-180	0.05-**0.07**-0.12	0.05-**0.07**-0.12	0.05-**0.08**-0.13	0.06-**0.08**-0.15	0.07-**0.09**-0.16
			SCM, SNCM Hardened	275	G	ACP100	100-**170**-240	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.07-**0.10**-0.12	0.08-**0.10**-0.13
			SCM, SNCM Hardened	300	G	ACP100	90-**150**-210	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.07-**0.10**-0.12	0.08-**0.10**-0.13
			SCM, SNCM Hardened	350	G	ACP100	75-**120**-165	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.07-**0.10**-0.12	0.08-**0.10**-0.13
		High-alloy Steel	SKD,SKT,SKH	200	G	ACP100	120-**180**-240	0.08-**0.11**-0.14	0.08-**0.12**-0.15	0.08-**0.12**-0.16	0.09-**0.14**-0.18	0.10-**0.14**-0.19
			SKD, SKT, SKH (Sintered)	325	G	ACP100	100-**140**-180	0.06-**0.09**-0.11	0.06-**0.09**-0.11	0.06-**0.09**-0.11	0.07-**0.10**-0.12	0.08-**0.10**-0.13
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACM300	120-**150**-180	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.07-**0.10**-0.16	0.08-**0.12**-0.16
			SUS403/Others (Martensitic (hardened))	240	M	ACM300	90-**120**-150	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.07-**0.10**-0.16	0.08-**0.12**-0.16
			SUS304, SUS316 (Austenitic)	180	M	ACM300	120-**150**-180	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.06-**0.08**-0.15	0.07-**0.10**-0.16	0.08-**0.12**-0.16
	K	Cast Iron			H	ACK300	120-**160**-200	0.09-**0.18**-0.27	0.10-**0.20**-0.30	0.11-**0.22**-0.32	0.12-**0.24**-0.36	0.13-**0.26**-0.40
		Ductile Cast Iron			H	ACK300	90-**120**-150	0.09-**0.18**-0.27	0.10-**0.20**-0.30	0.11-**0.22**-0.32	0.12-**0.24**-0.36	0.13-**0.26**-0.40
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		200	G	ACP300	25-**50**-70	0.06-**0.10**-0.15	0.06-**0.10**-0.15	0.06-**0.11**-0.16	0.07-**0.12**-0.18	0.08-**0.13**-0.20
	N	Aluminum Alloy			G	DL1500	200-**260**-320	0.06-**0.11**-0.17	0.06-**0.11**-0.17	0.06-**0.12**-0.18	0.07-**0.13**-0.20	0.08-**0.14**-0.22
		Copper Alloy			G	DL1500	180-**230**-280	0.06-**0.11**-0.17	0.06-**0.11**-0.17	0.06-**0.12**-0.18	0.07-**0.13**-0.20	0.08-**0.14**-0.22

For the P and K grades for which ACP300 and ACK300 inserts are the first recommendation, ACP100 inserts are the second recommendation.
In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

WDX series for 4D (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.25% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

CVD Coat | PVD Coat | AURORA Coat DLC | Coolant Hole | 4D | Indexable

Drilling tolerance: 0 to +0.25mm

*Refer to N36 for the tolerance of h7

Fig 1

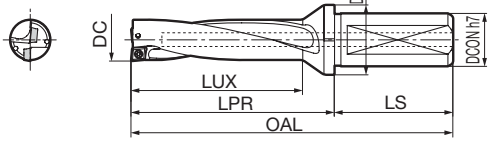


Fig 2

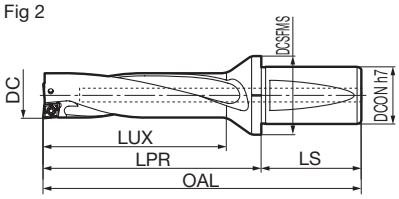
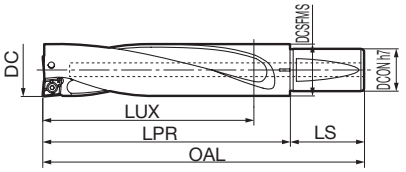


Fig 3



Diameter ø13.0 to 45.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
13.0	●	WDX 130D4S20	55	70	114	44	28.0	20	0.35		1
13.5	●	135D4S20	57	72	116	44	28.0	20	0.30	WDXT 042004	1
14.0	●	140D4S20	59	74	118	44	28.0	20	0.25		1
14.5	●	145D4S20	61	76	120	44	28.0	20	0.20		1
15.0	●	150D4S20	63	78	122	44	28.0	20	0.15		1
15.5	●	WDX 155D4S20	65	80	124	44	30.0	20	0.40		1
16.0	●	160D4S20	67	82	126	44	30.0	20			1
16.5	●	165D4S20	69	84	128	44	30.0	20	0.35	WDXT 052504	1
17.0	●	170D4S20	71	86	130	44	30.0	20	0.30		1
17.5	●	WDX 175D4S25	73	88	144	56	32.0	25	0.25		1
18.0	●	180D4S25	75	90	146	56	32.0	25	0.20		1
18.5	●	WDX 185D4S25	77	92	148	56	33.0	25	0.50		1
19.0	●	190D4S25	79	94	150	56	33.0	25	0.45		1
19.5	●	195D4S25	81	96	152	56	33.0	25	0.40		1
20.0	●	200D4S25	83	98	154	56	33.0	25	0.30	WDXT 063006	1
20.5	●	205D4S25	85	100	156	56	33.0	25			1
21.0	●	210D4S25	87	102	158	56	33.0	25	0.20		1
21.5	●	215D4S25	89	104	160	56	33.0	25	0.15		1
22.0	●	220D4S25	91	106	162	56	33.0	25	0.10		1
22.5	●	225D4S25	93	108	164	56	33.0	25	0.05		1
23.0	●	WDX 230D4S25	95	113	169	56	37.0	25	0.70		1
23.5	●	235D4S25	97	115	171	56	37.0	25			1
24.0	●	240D4S25	99	117	173	56	37.0	25	0.60		1
24.5	●	245D4S25	101	119	175	56	37.0	25	0.50		1
25.0	●	250D4S25	103	121	177	56	37.0	25			1
25.5	●	WDX 255D4S32	105	125	185	60	41.0	32	0.45	WDXT 073506	2
26.0	●	260D4S32	107	127	187	60	41.0	32	0.40		2
26.5	●	265D4S32	109	129	189	60	41.0	32	0.35		2
27.0	●	270D4S32	111	131	191	60	41.0	32	0.25		2
27.5	●	275D4S32	113	133	193	60	41.0	32	0.20		2
28.0	●	280D4S32	115	135	195	60	41.0	32	0.15		2
28.5	●	285D4S32	117	137	197	60	41.0	32	0.10		2
29.0	●	WDX 290D4S32	120	141	201	60	50.0	32	1.00		2
29.5	●	295D4S32	122	143	203	60	50.0	32	0.95		2
30.0*	●	300D4S32	124	148	208	60	54.0	32	0.90		2
31.0*	●	310D4S32	128	152	212	60	54.0	32	0.80		2
32.0*	●	320D4S32	132	156	216	60	54.0	32	0.70		2
30.0*	●	WDX 300D4S40	124	148	218	70	54.0	40	0.90	WDXT 094008	2
31.0*	●	310D4S40	128	152	222	70	54.0	40	0.80		2
32.0*	●	320D4S40	132	156	226	70	54.0	40	0.70		2
33.0	●	330D4S40	136	160	230	70	54.0	40	0.55		2
34.0	●	340D4S40	140	164	234	70	54.0	40	0.45		2
35.0	●	350D4S40	144	168	238	70	54.0	40	0.35		2
36.0	●	360D4S40	148	172	242	70	54.0	40	0.20		2
37.0	●	WDX 370D4S40	153	183	253	70	49.5	40	1.00		2
38.0	●	380D4S40	157	187	257	70	49.5	40			2
39.0	●	390D4S40	161	191	261	70	49.5	40	0.90		2
40.0	●	400D4S40	165	195	265	70	49.5	40	0.80		2
41.0	●	410D4S40	169	199	269	70	49.5	40	0.70	WDXT 125012	2
42.0	●	420D4S40	173	203	273	70	49.5	40	0.60		2
43.0	●	430D4S40	177	207	277	70	49.5	40	0.50		2
44.0	●	440D4S40	181	211	281	70	49.5	40			2
45.0	●	450D4S40	185	215	285	70	49.5	40	0.40		2

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Radial Offset Amount J140

Diameter ø46.0 to 63.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
46.0	●	WDX 460D4S40	189	219	289	70	49.5	40	1.50		2
47.0	●	470D4S40	193	223	293	70	49.5	40	1.40		2
48.0	●	480D4S40	197	227	297	70	49.5	40	1.30		2
49.0	●	490D4S40	201	231	301	70	49.5	40	1.20		2
50.0	●	500D4S40	205	235	305	70	49.5	40	1.10	WDXT 156012	2
51.0	●	510D4S40	209	239	309	70	49.5	40	1.00		3
52.0	●	520D4S40	213	243	313	70	50.5	40	0.90		3
53.0	●	530D4S40	217	247	317	70	51.5	40	0.80		3
54.0	●	540D4S40	221	251	321	70	52.5	40	0.60		3
55.0	●	550D4S40	225	255	325	70	53.5	40	0.50		3
56.0	●	WDX 560D4S40	232	264	334	70	54.0	40	2.00		3
57.0	●	570D4S40	236	268	338	70	55.0	40	1.80		3
58.0	●	580D4S40	240	272	342	70	56.0	40	1.70		3
59.0	●	590D4S40	244	276	346	70	57.0	40	1.60	WDXT 186012	3
60.0	●	600D4S40	248	280	350	70	58.0	40	1.50		3
61.0	●	610D4S40	252	284	354	70	59.0	40	1.40		3
62.0	●	620D4S40	256	288	358	70	60.0	40	1.30		3
63.0	●	630D4S40	260	292	362	70	61.0	40	1.20		3

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Parts

Applicable Holders	Flat Insert Screw	N·m	Wrench	Wrench
WDX130D4S20 to WDX150D4S20	BFTX01604N	0.3	TRX06	-
WDX155D4S20 to WDX180D4S25	BFTX0204N	0.5	TRX06	-
WDX185D4S25 to WDX225D4S25	BFTY02206	1.0	-	TRD07
WDX230D4S25 to WDX285D4S32	BFTX02506N	1.5	-	TRD08
WDX290D4S32 to WDX360D4S40	BFTX03584	3.5	-	TRD15
WDX370D4S40 to WDX450D4S40	BFTX0511N	5.0	-	TRD20
WDX460D4S40 to WDX630D4S40	BFTX0615N	5.0	-	TRD25

Identification Code

WDX 200 D4 S25

- WDX: Dia. DC (ø20.0)
- D4: Flute Length L/D (4D)
- S25: Shank Dia. DCON (ø25.0)

N·m Recommended Tightening Torque (N·m)

WDX series for 4D (Internal Coolant Supply)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	P, K				N
	General-purpose		P	M		
	Roughing		P		K	

Cat. No.	ACP100	ACP300	ACM300	ACK300	DL1500	Fig	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holders
WDXT 042004-L	●	●		●		1	4.2	2.0	0.4	0.4	WDX130D4S20 to WDX150D4S20
042004-G	●	●		●	●	2	4.2	2.0	0.4	0.4	
042004-H	●	●		●		3	4.2	2.0	0.4	0.4	
042004-M			●			4	4.2	2.0	0.4	0.8	
WDXT 052504-L	●	●		●		1	5.0	2.5	0.4	0.4	WDX155D4S20 to WDX180D4S25
052504-G	●	●		●	●	2	5.0	2.5	0.4	0.4	
052504-H	●	●		●		3	5.0	2.5	0.4	0.4	
052504-M			●			4	5.0	2.5	0.4	1.0	
WDXT 063006-L	●	●		●		1	6.0	3.0	0.6	0.6	WDX185D4S25 to WDX225D4S25
063006-G	●	●		●	●	2	6.0	3.0	0.6	0.6	
063006-H	●	●		●		3	6.0	3.0	0.6	0.6	
063006-M			●			4	6.0	3.0	0.6	1.4	
WDXT 073506-L	●	●		●		1	7.5	3.5	0.6	0.6	WDX230D4S25 to WDX285D4S32
073506-G	●	●		●	●	2	7.5	3.5	0.6	0.6	
073506-H	●	●		●		3	7.5	3.5	0.6	0.6	
073506-M			●			4	7.5	3.5	0.6	1.6	
WDXT 094008-L	●	●		●		1	9.6	4.0	0.8	0.8	WDX290D4S32 to WDX360D4S40
094008-G	●	●		●	●	2	9.6	4.0	0.8	0.8	
094008-H	●	●		●		3	9.6	4.0	0.8	0.8	
094008-M			●			4	9.6	4.0	0.8	2.4	
WDXT 125012-L	●	●		●		1	12.4	5.0	1.2	1.2	WDX370D4S40 to WDX450D4S40
125012-G	●	●		●	●	2	12.4	5.0	1.2	1.2	
125012-H	●	●		●		3	12.4	5.0	1.2	1.2	
125012-M			●			4	12.4	5.0	1.2	3.2	
WDXT 156012-L	●	●		●		1	15.2	6.0	1.2	1.2	WDX460D4S40 to WDX550D4S40
156012-G	●	●		●	●	2	15.2	6.0	1.2	1.2	
156012-H	●	●		●		3	15.2	6.0	1.2	1.2	
WDXT 186012-L	●	●		●		1	18.0	6.0	1.2	1.2	WDX560D4S40 to WDX630D4S40
186012-G	●	●		●		2	18.0	6.0	1.2	1.2	
186012-H	●	●		●		3	18.0	6.0	1.2	1.2	

Fig 1 For low feed with chip control

L type

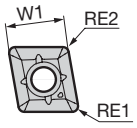


Fig 2 General-purpose

G type

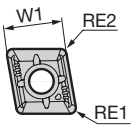


Fig 3 Strong edged

H type

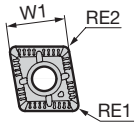
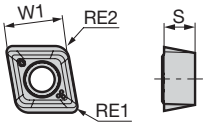


Fig 4 Dedicated for stainless steel

M type



Identification Code

WDXT 06 30 06 -G

- 06: Width across Flats (6.0)
- 30: Thickness x 10 (3.0)
- 06: Corner Radius x 10 (0.6)
- -G: Breaker type

Recommended Cutting Conditions (for 4D)

		Work Material		Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f feed rate (mm/rev) (Min. - **Optimum** - Max.) ø13.0 to ø18.0	ø18.5 to ø29.0	ø29.5 to ø36.0	ø37.0 to ø55.0	ø56.0 to ø63.0
4D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-**180**-240	0.05-**0.07**-0.10	0.05-**0.07**-0.10	0.05-**0.07**-0.10	0.05-**0.08**-0.10	0.06-**0.09**-0.11
			S15C	125	L	ACP300	130-**170**-220	0.04-**0.07**-0.09	0.04-**0.07**-0.09	0.04-**0.07**-0.09	0.05-**0.08**-0.10	0.06-**0.09**-0.11
			S45C	190	G	ACP300	100-**150**-200	0.08-**0.11**-0.17	0.08-**0.11**-0.17	0.08-**0.12**-0.18	0.09-**0.14**-0.21	0.10-**0.15**-0.23
			S45C Hardened	250	G	ACP100	100-**170**-240	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.06-**0.09**-0.13
			S75C	270	G	ACP100	120-**180**-240	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.06-**0.09**-0.13	0.07-**0.11**-0.14	0.08-**0.11**-0.15
			S75C Hardened	300	G	ACP100	85-**150**-210	0.05-**0.07**-0.09	0.05-**0.07**-0.09	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.06-**0.09**-0.12
		Low-alloy Steel	SCM,SNCM	180	L	ACP300	100-**140**-180	0.05-**0.07**-0.10	0.05-**0.07**-0.10	0.05-**0.07**-0.11	0.06-**0.08**-0.12	0.07-**0.09**-0.14
			SCM, SNCM Hardened	275	G	ACP100	100-**170**-240	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.06-**0.08**-0.11
			SCM, SNCM Hardened	300	G	ACP100	90-**150**-210	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.06-**0.08**-0.11
			SCM, SNCM Hardened	350	G	ACP100	75-**120**-165	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.06-**0.08**-0.11
		High-alloy Steel	SKD,SKT,SKH	200	G	ACP100	120-**180**-240	0.06-**0.10**-0.13	0.07-**0.11**-0.14	0.07-**0.11**-0.15	0.08-**0.12**-0.16	0.09-**0.13**-0.17
			SKD, SKT, SKH (Sintered)	325	G	ACP100	100-**140**-180	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.06-**0.08**-0.11
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACM300	120-**150**-180	0.06-**0.08**-0.13	0.06-**0.08**-0.13	0.06-**0.08**-0.14	0.07-**0.09**-0.14	0.08-**0.11**-0.14
			SUS403/Others (Martensitic (hardened))	240	M	ACM300	90-**120**-150	0.06-**0.08**-0.13	0.06-**0.08**-0.13	0.06-**0.08**-0.14	0.07-**0.09**-0.14	0.08-**0.11**-0.14
			SUS304, SUS316 (Austenitic)	180	M	ACM300	120-**150**-180	0.06-**0.08**-0.13	0.06-**0.08**-0.13	0.06-**0.08**-0.14	0.07-**0.09**-0.14	0.08-**0.11**-0.14
	K	Cast Iron			H	ACK300	120-**160**-200	0.09-**0.17**-0.23	0.10-**0.19**-0.26	0.11-**0.21**-0.28	0.12-**0.23**-0.31	0.13-**0.25**-0.34
		Ductile Cast Iron			H	ACK300	90-**120**-150	0.09-**0.17**-0.23	0.10-**0.19**-0.26	0.11-**0.21**-0.28	0.12-**0.23**-0.31	0.13-**0.25**-0.34
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		200	G	ACP300	25-**50**-70	0.06-**0.10**-0.13	0.06-**0.10**-0.13	0.06-**0.10**-0.14	0.07-**0.11**-0.15	0.08-**0.12**-0.17
	N	Aluminum Alloy			G	DL1500	200-**260**-320	0.05-**0.10**-0.15	0.05-**0.10**-0.15	0.06-**0.11**-0.16	0.06-**0.12**-0.18	0.07-**0.13**-0.20
		Copper Alloy			G	DL1500	180-**230**-280	0.05-**0.10**-0.15	0.05-**0.10**-0.15	0.06-**0.11**-0.16	0.06-**0.12**-0.18	0.07-**0.13**-0.20

For the P and K grades for which ACP300 and ACK300 inserts are the first recommendation, ACP100 inserts are the second recommendation.
In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

WDX series for 5D (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.25% | Hardened Steel up to 45HRC | Stainless Steel | Cast Iron | Ductile Cast Iron | Aluminum Alloy

CVD Coat | PVD Coat | AURORA Coat DLC | Coolant Hole | 5D | Indexable

Drilling tolerance: 0 to +0.25mm

*Refer to N36 for the tolerance of h7

Fig 1

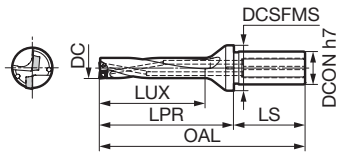


Fig 2

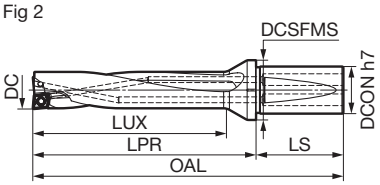
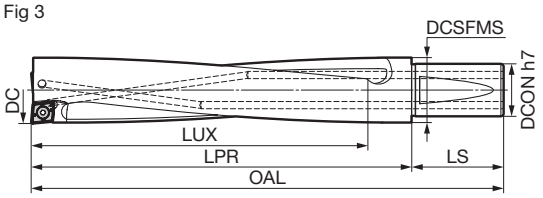


Fig 3



Diameter ø13.0 to 45.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
13.0	●	WDX 130D5S20	68.0	83.0	127.0	44	28.0	20.0	0.35	WDXT 042004	1
13.5	●	135D5S20	70.5	85.5	129.5	44	28.0	20.0	0.30		1
14.0	●	140D5S20	73.0	88.0	132.0	44	28.0	20.0	0.25		1
14.5	●	145D5S20	75.5	90.5	134.5	44	28.0	20.0	0.20		1
15.0	●	150D5S20	78.0	93.0	137.0	44	28.0	20.0	0.15		1
15.5	●	WDX 155D5S20	80.5	95.5	139.5	44	30.0	20.0	0.40	WDXT 052504	1
16.0	●	160D5S20	83.0	98.0	142.0	44	30.0	20.0			1
16.5	●	165D5S20	85.5	100.5	144.5	44	30.0	20.0	0.35		1
17.0	●	170D5S20	88.0	103.0	147.0	44	30.0	20.0	0.30		1
17.5	●	WDX 175D5S25	90.5	105.5	161.5	56	32.0	25.0	0.25		1
18.0	●	180D5S25	93.0	108.0	164.0	56	32.0	25.0	0.20		1
18.5	●	WDX 185D5S25	95.5	110.5	166.5	56	33.0	25.0	0.50	WDXT 063006	1
19.0	●	190D5S25	98.0	113.0	169.0	56	33.0	25.0	0.45		1
19.5	●	195D5S25	100.5	115.5	171.5	56	33.0	25.0	0.40		1
20.0	●	200D5S25	103.0	118.0	174.0	56	33.0	25.0	0.30		1
20.5	●	205D5S25	105.5	120.5	176.5	56	33.0	25.0			1
21.0	●	210D5S25	108.0	123.0	179.0	56	33.0	25.0	0.20		1
21.5	●	215D5S25	110.5	125.5	181.5	56	33.0	25.0	0.15		1
22.0	●	220D5S25	113.0	128.0	184.0	56	33.0	25.0	0.10		1
22.5	●	225D5S25	115.5	130.5	186.5	56	33.0	25.0	0.05		1
23.0	●	WDX 230D5S25	118.0	136.0	192.0	56	37.0	25.0	0.70	WDXT 073506	1
23.5	●	235D5S25	120.5	138.5	194.5	56	37.0	25.0			1
24.0	●	240D5S25	123.0	141.0	197.0	56	37.0	25.0	0.60		1
24.5	●	245D5S25	125.5	143.5	199.5	56	37.0	25.0	0.50		1
25.0	●	250D5S25	128.0	146.0	202.0	56	37.0	25.0			1
26.0	●	WDX 260D5S32	133.0	153.0	213.0	60	41.0	32.0	0.40		2
27.0	●	270D5S32	138.0	158.0	218.0	60	41.0	32.0	0.25		2
28.0	●	280D5S32	143.0	163.0	223.0	60	41.0	32.0	0.15		2
29.0	●	WDX 290D5S32	149.0	170.0	230.0	60	50.0	32.0	1.00	WDXT 094008	2
30.0*	●	300D5S32	154.0	178.0	238.0	60	54.0	32.0	0.90		2
31.0*	●	310D5S32	159.0	183.0	243.0	60	54.0	32.0	0.80		2
32.0*	●	320D5S32	164.0	188.0	248.0	60	54.0	32.0	0.70		2
30.0*	●	WDX 300D5S40	154.0	178.0	248.0	70	54.0	40.0	0.90		2
31.0*	●	310D5S40	159.0	183.0	253.0	70	54.0	40.0	0.80		2
32.0*	●	320D5S40	164.0	188.0	258.0	70	54.0	40.0	0.70		2
33.0	●	330D5S40	169.0	193.0	263.0	70	54.0	40.0	0.55		2
34.0	●	340D5S40	174.0	198.0	268.0	70	54.0	40.0	0.45		2
35.0	●	350D5S40	179.0	203.0	273.0	70	54.0	40.0	0.35		2
36.0	●	360D5S40	184.0	208.0	278.0	70	54.0	40.0	0.20		2
37.0	●	WDX 370D5S40	190.0	220.0	290.0	70	49.5	40.0	1.00	WDXT 125012	2
38.0	●	380D5S40	195.0	225.0	295.0	70	49.5	40.0			2
39.0	●	390D5S40	200.0	230.0	300.0	70	49.5	40.0	0.90		2
40.0	●	400D5S40	205.0	235.0	305.0	70	49.5	40.0	0.80		2
41.0	●	410D5S40	210.0	240.0	310.0	70	49.5	40.0	0.70		2
42.0	●	420D5S40	215.0	245.0	315.0	70	49.5	40.0	0.60		2
43.0	●	430D5S40	220.0	250.0	320.0	70	49.5	40.0	0.50		2
44.0	●	440D5S40	225.0	255.0	325.0	70	49.5	40.0			2
45.0	●	450D5S40	230.0	260.0	330.0	70	49.5	40.0	0.40		2

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Radial Offset Amount ☞J140

Diameter ø46.0 to 55.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Dia. DCSFMS	Shank Dia. DCON	Radial Offset Amount (Max)	Applicable Insert	Fig
46.0	●	WDX 460D5S40	235.0	265.0	335.0	70	49.5	40.0	1.50	WDXT 156012	2
47.0	●	470D5S40	240.0	270.0	340.0	70	49.5	40.0	1.40		2
48.0	●	480D5S40	245.0	275.0	345.0	70	49.5	40.0	1.30		2
49.0	●	490D5S40	250.0	280.0	350.0	70	49.5	40.0	1.20		2
50.0	●	500D5S40	255.0	285.0	355.0	70	49.5	40.0	1.10		2
51.0	●	510D5S40	260.0	290.0	360.0	70	49.5	40.0	1.00		3
52.0	●	520D5S40	265.0	295.0	365.0	70	50.5	40.0	0.90		3
53.0	●	530D5S40	270.0	300.0	370.0	70	51.5	40.0	0.80		3
54.0	●	540D5S40	275.0	305.0	375.0	70	52.5	40.0	0.60		3
55.0	●	550D5S40	280.0	310.0	380.0	70	53.5	40.0	0.50		3

*Diameters ø30, ø31, ø32 are in stock with shank diameters of ø32 and ø40.

Parts

Applicable Holders	Flat Insert Screw	N·m	Wrench	Wrench
WDX130D5S20 to WDX150D5S20	BFTX01604N	0.3	TRX06	-
WDX155D5S20 to WDX180D5S25	BFTX0204N	0.5	TRX06	-
WDX185D5S25 to WDX225D5S25	BFTY02206	1.0	-	TRD07
WDX230D5S25 to WDX280D5S32	BFTX02506N	1.5	-	TRD08
WDX290D5S32 to WDX360D5S40	BFTX03584	3.5	-	TRD15
WDX370D5S40 to WDX450D5S40	BFTX0511N	5.0	-	TRD20
WDX460D5S40 to WDX550D5S40	BFTX0615N	5.0	-	TRD25

Identification Code

WDX 200 D5 S25

- WDX: Dia. DC (ø20.0)
- 200: Flute Length (L/D) (5D)
- D5: Shank Dia. DCON (ø25.0)
- S25

N·m Recommended Tightening Torque (N·m)

WDX series for 5D (Internal Coolant Supply)

Insert

Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	PK				N
	General-purpose		P	M		
	Roughing		P		K	

Cat. No.	ACP100	ACP300	ACM300	ACK300	DL1500	Fig	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holders
WDXT 042004-L	●	●		●		1	4.2	2.0	0.4	0.4	WDX130D5S20 to WDX150D5S20
042004-G	●	●		●	●	2	4.2	2.0	0.4	0.4	
042004-H	●	●		●		3	4.2	2.0	0.4	0.4	
042004-M			●			4	4.2	2.0	0.4	0.8	
WDXT 052504-L	●	●		●		1	5.0	2.5	0.4	0.4	WDX155D5S20 to WDX180D5S25
052504-G	●	●		●	●	2	5.0	2.5	0.4	0.4	
052504-H	●	●		●		3	5.0	2.5	0.4	0.4	
052504-M			●			4	5.0	2.5	0.4	1.0	
WDXT 063006-L	●	●		●		1	6.0	3.0	0.6	0.6	WDX185D5S25 to WDX225D5S25
063006-G	●	●		●	●	2	6.0	3.0	0.6	0.6	
063006-H	●	●		●		3	6.0	3.0	0.6	0.6	
063006-M			●			4	6.0	3.0	0.6	1.4	
WDXT 073506-L	●	●		●		1	7.5	3.5	0.6	0.6	WDX230D5S25 to WDX280D5S32
073506-G	●	●		●	●	2	7.5	3.5	0.6	0.6	
073506-H	●	●		●		3	7.5	3.5	0.6	0.6	
073506-M			●			4	7.5	3.5	0.6	1.6	
WDXT 094008-L	●	●		●		1	9.6	4.0	0.8	0.8	WDX290D5S32 to WDX360D5S40
094008-G	●	●		●	●	2	9.6	4.0	0.8	0.8	
094008-H	●	●		●		3	9.6	4.0	0.8	0.8	
094008-M			●			4	9.6	4.0	0.8	2.4	
WDXT 125012-L	●	●		●		1	12.4	5.0	1.2	1.2	WDX370D5S40 to WDX450D5S40
125012-G	●	●		●	●	2	12.4	5.0	1.2	1.2	
125012-H	●	●		●		3	12.4	5.0	1.2	1.2	
125012-M			●			4	12.4	5.0	1.2	3.2	
WDXT 156012-L	●	●		●		1	15.2	6.0	1.2	1.2	WDX460D5S40 to WDX550D5S40
156012-G	●	●		●	●	2	15.2	6.0	1.2	1.2	
156012-H	●	●		●		3	15.2	6.0	1.2	1.2	

Fig 1 For low feed with chip control

L type

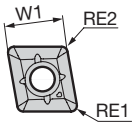


Fig 2 General-purpose

G type

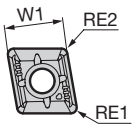


Fig 3 Strong edged

H type

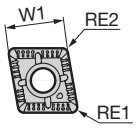
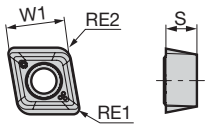


Fig 4 Dedicated for stainless steel

M type



Identification Code

WDXT 06 30 06 -G

- 06: Width across Flats (6.0)
- 30: Thickness x 10 (3.0)
- 06: Corner Radius x 10 (0.6)
- -G: Breaker type

Recommended Cutting Conditions (for 5D)

		Work Material		Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f feed rate (mm/rev) (Min. - **Optimum** - Max.) ø13.0 to ø18.0	ø18.5 to ø29.0	ø29.5 to ø36.0	ø37.0 to ø55.0
5D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-**180**-240	0.05-**0.06**-0.09	0.05-**0.06**-0.09	0.05-**0.06**-0.09	0.05-**0.07**-0.09
			S15C	125	L	ACP300	130-**170**-220	0.04-**0.06**-0.08	0.04-**0.06**-0.08	0.04-**0.06**-0.08	0.05-**0.07**-0.09
			S45C	190	G	ACP300	100-**150**-200	0.07-**0.10**-0.15	0.07-**0.10**-0.15	0.08-**0.11**-0.17	0.09-**0.12**-0.19
			S45C Hardened	250	G	ACP100	100-**170**-240	0.04-**0.07**-0.08	0.04-**0.07**-0.08	0.05-**0.07**-0.09	0.05-**0.08**-0.11
			S75C	270	G	ACP100	120-**180**-240	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.06-**0.08**-0.11	0.07-**0.09**-0.13
			S75C Hardened	300	G	ACP100	85-**150**-210	0.04-**0.07**-0.08	0.04-**0.07**-0.08	0.05-**0.07**-0.09	0.05-**0.08**-0.10
		Low-alloy Steel	SCM,SNCM	180	L	ACP300	100-**140**-180	0.05-**0.06**-0.09	0.05-**0.06**-0.09	0.05-**0.06**-0.10	0.05-**0.07**-0.11
			SCM, SNCM Hardened	275	G	ACP100	100-**170**-240	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.05-**0.07**-0.10
			SCM, SNCM Hardened	300	G	ACP100	90-**150**-210	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.05-**0.07**-0.10
			SCM, SNCM Hardened	350	G	ACP100	75-**120**-165	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.05-**0.07**-0.10
		High-alloy Steel	SKD,SKT,SKH	200	G	ACP100	120-**180**-240	0.05-**0.08**-0.12	0.06-**0.09**-0.12	0.06-**0.09**-0.13	0.07-**0.10**-0.14
			SKD, SKT, SKH (Sintered)	325	G	ACP100	100-**140**-180	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACM300	120-**150**-180	0.05-**0.08**-0.11	0.05-**0.08**-0.12	0.05-**0.08**-0.12	0.06-**0.09**-0.12
			SUS403/Others (Martensitic (hardened))	240	M	ACM300	90-**120**-150	0.05-**0.08**-0.11	0.05-**0.08**-0.12	0.05-**0.08**-0.12	0.06-**0.09**-0.12
			SUS304, SUS316 (Austenitic)	180	M	ACM300	120-**150**-180	0.05-**0.08**-0.11	0.05-**0.08**-0.12	0.05-**0.08**-0.12	0.06-**0.09**-0.12
	K	Cast Iron			H	ACK300	120-**160**-200	0.08-**0.15**-0.21	0.09-**0.17**-0.23	0.09-**0.18**-0.25	0.11-**0.20**-0.28
		Ductile Cast Iron			H	ACK300	90-**120**-150	0.08-**0.15**-0.21	0.09-**0.17**-0.23	0.09-**0.18**-0.25	0.11-**0.20**-0.28
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		200	G	ACP300	25-**50**-70	0.05-**0.09**-0.11	0.05-**0.09**-0.11	0.06-**0.09**-0.12	0.06-**0.10**-0.14
	N	Aluminum Alloy			G	DL1500	200-**260**-320	0.05-**0.10**-0.15	0.05-**0.10**-0.15	0.06-**0.11**-0.16	0.06-**0.12**-0.18
		Copper Alloy			G	DL1500	180-**230**-280	0.05-**0.10**-0.15	0.05-**0.10**-0.15	0.06-**0.11**-0.16	0.06-**0.12**-0.18

For the P and K grades for which ACP300 and ACK300 inserts are the first recommendation, ACP100 inserts are the second recommendation.
In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

■ Lathe Drilling Guidelines

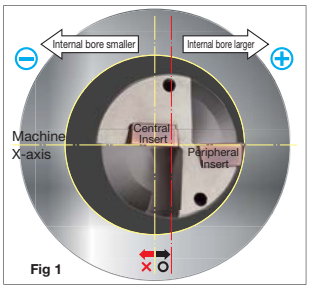


Fig 1

Fig 2

■ Drill Mounting

- Set the drill so that the peripheral insert is parallel to the X-axis of the machine. (See Fig 1)
- Press the end of the flange of the drill tightly against the face of the holder before tightening the bolt.

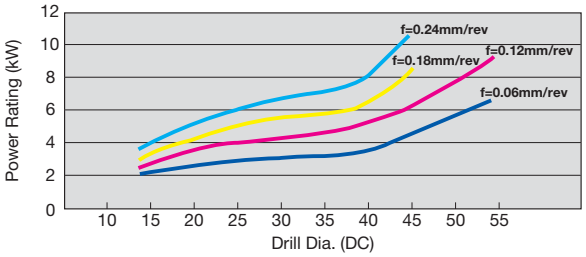
■ Adjusting Work Diameter (offset)

- The work diameter is adjustable by moving the machine X-axis.
- Make the adjustment by moving in the positive direction of the X-axis (enlarging the bore diameter). Moving the X-axis in the negative direction (to reduce the bore diameter) is not recommended as the holder may interfere with the hole. (Fig 1)
- The maximum allowable adjustment (offset) differs depending on the diameter. Refer to Radial Offset (Max) in the body dimension tables on pages J132 to J138.

■ Other Notes

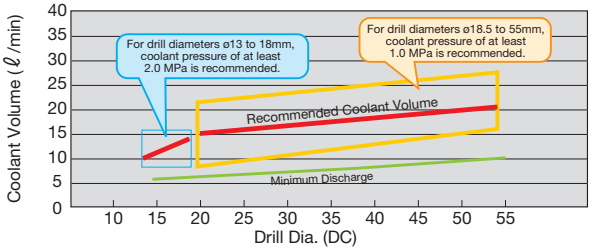
- When the drill is mounted on a lathe, the centre of the central insert is designed to be 0.15 to 0.2mm below the centre of the spindle.
- If the spindle deviates so far off centre that the centre of the central insert lies above the spindle centre, the central insert will break.
- Set the depth of cut for external turning or internal boring work to 1/5 or less of the drill diameter (max. 5mm or less). (Example: Set depth of cut to 4mm or less for diameter of ø20mm)
- Install a cover to prevent injury from possible chip fly-out (see disc-shaped chip in Figure 2) when through boring on a lathe.
  If your equipment has no cover, attach a cover or similar part for your safety.

■ Typical Power Ratings



<CAUTIONS>
- Power ratings are subject to change based on conditions such as work material and cutting speed, and should only be used for reference.
- Cutting Conditions (Reference)
  Work Material: S50C (230HB)
  Cutting Speed: vc = 150m/min

■ Typical Coolant Volume



<CAUTIONS>
- Coolant volume is a factor that affects drilling performance, particularly with respect to chip evacuation and lubricity. This is particularly important for chip evacuation and lubricity.
- Coolant pressure should be set higher for small drills. (ø18.0mm or smaller)
- Coolant volume is usually adjusted by changing the coolant pressure provided on most CNC machine tools.
- This table provides guideline values only. More coolant may be required depending on the machine, coolant and work material.

■ Precautions for Attaching and Removing Inserts

- Before mounting the insert, remove all traces of foreign matter on the insert seat surface using air or other means.
- When using the wrench, align it to the axis of the screw and press while turning. (Fig 3)
  If the wrench is not aligned with the screw, the insert will be insufficiently clamped and the tip of the wrench and/or the Torx hole of the screw may become deformed.
- Do not allow clearance between the insert seat and drill when mounting the insert. (Fig 4, A)
  Figure 4 shows a properly attached insert.

* It is normal for the outer sides of the central insert to have clearance because it is clamped at its centre and pushed to the rear.

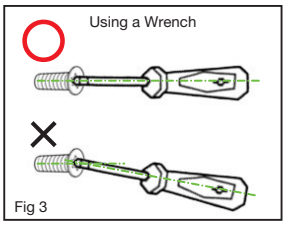


Fig 3

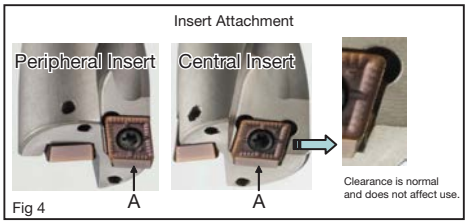


Fig 4

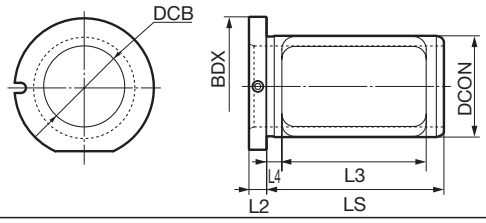
■ Troubleshooting

Problem	Symptom	Cause	Countermeasures
Too much variation in hole diameter	Drilled hole diameter is larger than desired	· Deflection of the holder due to high thrust force	· Decrease the feed rate to decrease the thrust force. · Make an adjustment on the X-axis.
	Drilled hole diameter is smaller than desired	· The cutting edge backs off and does not enter the workpiece	· Increase the feed rate. · Make an adjustment on the X-axis.
	Significant difference in hole diameter at entrance and bottom	· Packing of chips	· Increase the feed rate to improve chip evacuation. · Use an L type chipbreaker for chip control.
Poor quality machined hole surface	Poor machined surface from entrance to bottom of hole	· High cutting force · Low rigidity of workpiece	· Decrease the feed rate. · Review tooling to improve rigidity.
	Poor machined surface at bottom of hole	· Machined surfaces damaged by chips	· Increase the feed rate to improve chip evacuation. · Use an L type chipbreaker for chip control.
Insert is broken	Breakage on central insert (centre)	· Improper adjustment of centre height · Insert is not strong enough	· Check the centre height again. · If the drill is being used on a lathe, try flipping the drill 180°. · Use a strong edged chipbreaker (H type).
	Breakage on peripheral Insert	· High cutting load in cutting edge	· Decrease the feed rate to decrease cutting load. · Use a strong edged chipbreaker (H type).

Eccentric Sleeve for WDX series

Indexable

Fig 1



Body (WAS type)

Dimensions (mm)

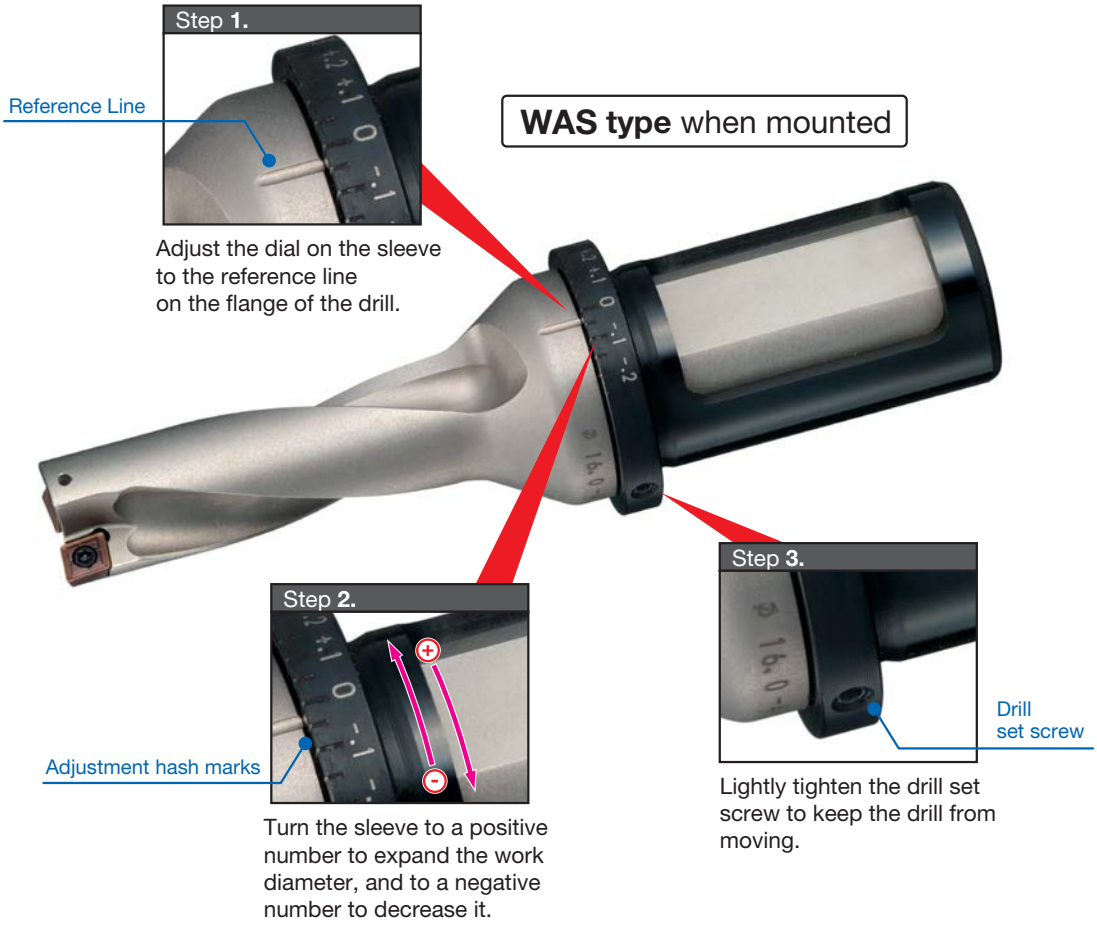
Cat. No.	Stock	Shank Dia. DCB	Shank Dia. DCON	Diameter BDX	Shank LS	Length L2	Length L3	Length L4	Diameter Adjustable Range	Fig	Parts: Screw	Parts: Wrench
WAS 2025-48	●	20	25	33	43	5	32	5	+0.3 to -0.2	1	BT0306	LH015
2532-60	●	25	32	42	60	7	46	6	+0.3 to -0.3	1	BT0406	LH020
3240-70	●	32	40	55	70	7	57	6	+0.3 to -0.3	1	BT0408	LH020
4050-85	●	40	50	60	70	7	54	6	+0.5 to -0.5	1	BT0408	LH020

Diameter Adjustment Range indicates the range in which the diameter can be adjusted.
The dedicated Eccentric Sleeve WAS type for the SumiDrill WDX series provides ±0.3mm of adjustment when drilling holes.

Cautions for Use

1. The dial is for reference purposes. Always measure the actual work diameter and adjust accordingly.
2. Not usable with collet chuck type holders.
   Use a side-locking type holder.
3. Use this product under high-rigidity conditions.
   This product is not recommended for deep hole drilling such as 5D and low-rigidity conditions.

Directions (Adjusting the Work Diameter)



PDL series/PCT series

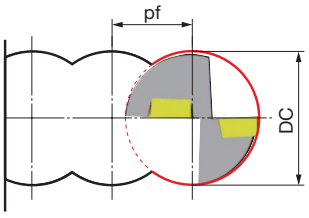
■ General Features

High efficiency and stable roughing can be achieved through Z-axis cutting feed, where tool rigidity is high, for machining deep profiles and pockets in applications where efficiency cannot be increased due to long tool overhang, such as in aerospace and die mold components.

■ Features

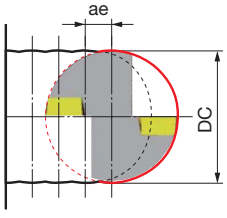
- The flat cutting edge design produces near-flat bottom profiles to reduce depth of cut variation for subsequent process.
- All sizes come with oil holes for internal coolant supply to improve chip evacuation performance.
- Durable body with special surface treatment offers improved tool life and reliability.
- Utilising SumiDrill WDX series inserts for handling a wide range of work materials, from steel to non-ferrous metals and exotic alloys.

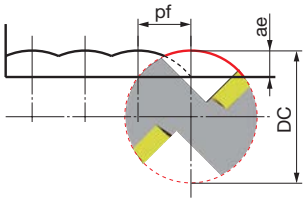
- The PDL series has a central insert, enabling radial depth of cut beyond the tool's radius, such as pick feed machining and drilling. (pocketing etc.)



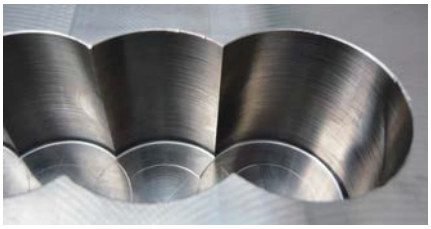
Keep the value of **pf** for PDL series tools to less than 70% of the tool diameter (**DC**).

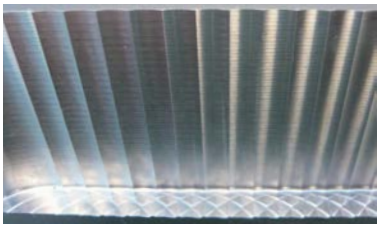
- Although the PCT series has limited radial depth of cut, the tool has a high effective number of teeth enabling it to perform high feed cutting. (Medium finishing of corners, hole expansion, deep grooving, etc.)





Keep the value of **pf** for PCT series tools to less than 50% of the tool diameter (**DC**).
For ae, refer to the dimension under "**ae** max" in the stock/dimensions table titled "Holders Max. Depth of Cut: 3D/5D".



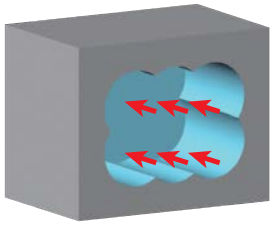


PDL series/PCT series

■ Application Examples

Pocketing PDL series

Work Material: Titanium alloy

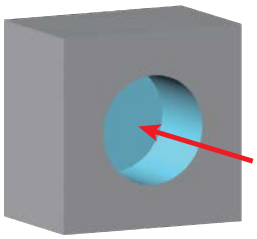


Tool : PDL 400D2S40 (ø40)
Insert : WDXT 125012-G
Grade : ACK300

Cutting Speed : vc = 40m/min
Feed Rate : f = 0.07mm/rev
(vf = 22.3mm/min)
Depth of Cut : ae (pf) = 25mm

Drilling PDL series

Work Material: SUS316

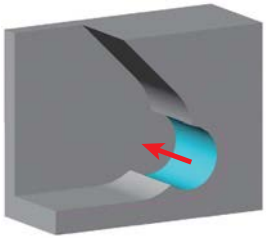


Tool : PDL 200D3S25 (ø20)
Insert : WDXT 063006-G
Grade : ACP300

Cutting Speed : vc = 180m/min
Feed Rate : f = 0.10mm/rev
(vf = 286mm/min)
Depth of Cut : ae (pf) = 20mm

Corner Fillet Removal PDL series

Work Material: SUS316

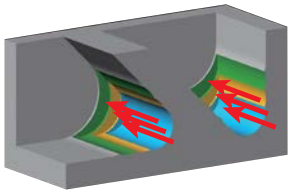


Tool : PDL 250D2S25 (ø25)
Insert : WDX T073506-G
Grade : ACP300

Cutting Speed : vc = 140m/min
Feed Rate : f = 0.10mm/rev
(vf = 178mm/min)
Depth of Cut : ae (pf) = 15mm

Corner Finishing PCT series

Work Material: Titanium alloy



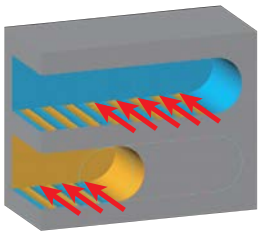
Tool:
PCT 320D3S32 (ø32)
PCT 250D3S25 (ø25)
PCT 200D3S20 (ø20)
Grade: ACK300

Insert:
WDXT 094008-G
WDXT 073506-G
WDXT 063006-G

Cutting Speed : vc = 50m/min
Feed Rate : fz = 0.04mm/t
(vf = 80 to 127mm/min)
Depth of Cut : ae(pf) = 3.2 to 6.5mm

Grooving PCT series

Work Material: Titanium alloy

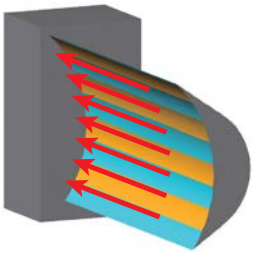


Tool : PCT 320D5S32 (ø32)
Insert : WDXT 094008-G
Grade : ACK300

Cutting Speed : vc = 40m/min
Feed Rate : fz = 0.035mm/t
(vf = 56mm/min)
Depth of Cut : ae (pf) = 5.0mm

Contouring PCT series

Work Material: SUS410

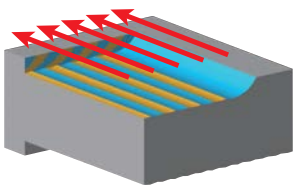


Tool : PCT 250D5S25 (ø25)
Insert : WDXT 073506-G
Grade : ACP300

Cutting Speed : vc = 150m/min
Feed Rate : fz = 0.05mm/t
(vf = 382mm/min)
Depth of Cut : ae = 3.0mm

Shoulder Plunging PCT series

Work Material: SUS304

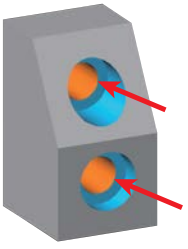


Tool : PCT 320D3S32 (ø32)
Insert : WDXT 094008-G
Grade : ACP300

Cutting Speed : vc = 180m/min
Feed Rate : fz = 0.075mm/t
(vf = 537mm/min)
Depth of Cut : ae = 7.0mm
pf = 5.0mm

Counterboring PCT series

Work Material: SCM435



Tool : PCT 200D5S20 (ø20)
Insert : WDXT 063006-G
Grade : ACP300

Cutting Speed : vc = 150m/min
Feed Rate : fz = 0.075mm/t
(vf = 716mm/min)
Depth of Cut : ae = 3.5mm

PDL series for 2D/3D (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.26% | Carbon Steel/ Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Cast Iron | Ductile Cast Iron | Aluminum Alloy | Copper Alloy

CVD Coat | PVD Coat | AURORA Coat DLC | Coolant Hole | 2D | 3D | Indexable

Fig 1

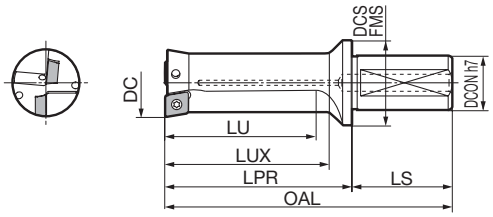
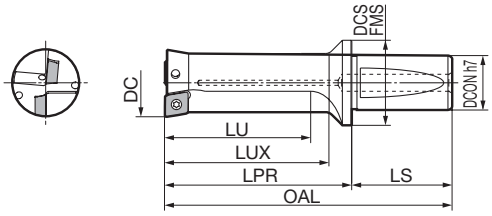


Fig 2



Holder for L/D = 2D Diameter ø16.0 to 40.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Effective Length LU	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Applicable Inserts	Fig
16.0	●	**PDL 160D2S20**	**32**	35	50	94	44	28	20	WDXT052504	1
20.0	●	**200D2S25**	**40**	43	58	114	56	33	25	WDXT063006	1
25.0	●	**250D2S25**	**50**	53	71	127	56	37	25	WDXT073506	1
32.0	●	**320D2S40**	**64**	68	92	162	70	54	40	WDXT094008	2
40.0	●	**400D2S40**	**80**	85	115	185	70	54	40	WDXT125012	2

Holder for L/D = 3D Diameter ø16.0 to 40.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Effective Length LU	Neck Length LUX	Overhang Length LPR	Overall Length OAL	Shank LS	Flange Diameter DCSFMS	Shank Dia. DCON	Applicable Inserts	Fig
16.0	●	**PDL 160D3S20**	**48**	51	66	110	44	28	20	WDXT052504	1
20.0	●	**200D3S25**	**60**	63	78	134	56	33	25	WDXT063006	1
25.0	●	**250D3S25**	**75**	78	96	152	56	37	25	WDXT073506	1
32.0	●	**320D3S40**	**96**	100	124	194	70	54	40	WDXT094008	2
40.0	●	**400D3S40**	**120**	125	155	225	70	54	40	WDXT125012	2

Insert

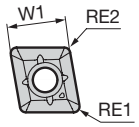
Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	PK				N
	General-purpose		P	M		
	Roughing		P		K	

Cat. No.	ACP100	ACP300	ACM300	ACK300	DL1500	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holder	Fig
WDXT 052504-L	●	●		●		5.0	2.5	0.4	0.4	PDL160D2S20 / PDL160D3S20	1
052504-G	●	●		●	●	5.0	2.5	0.4			2
052504-H	●	●		●		5.0	2.5	0.4			3
052504-M			●			5.0	2.5	0.4	1.0		4
WDXT 063006-L	●	●		●		6.0	3.0	0.6	0.6	PDL200D2S25 / PDL200D3S25	1
063006-G	●	●		●	●	6.0	3.0	0.6			2
063006-H	●	●		●		6.0	3.0	0.6			3
063006-M			●			6.0	3.0	0.6	1.4		4
WDXT 073506-L	●	●		●		7.5	3.5	0.6	0.6	PDL250D2S25 / PDL250D3S25	1
073506-G	●	●		●	●	7.5	3.5	0.6			2
073506-H	●	●		●		7.5	3.5	0.6			3
073506-M			●			7.5	3.5	0.6	1.6		4
WDXT 094008-L	●	●		●		9.6	4.0	0.8	0.8	PDL320D2S40 / PDL320D3S40	1
094008-G	●	●		●	●	9.6	4.0	0.8			2
094008-H	●	●		●		9.6	4.0	0.8			3
094008-M			●			9.6	4.0	0.8	2.4		4
WDXT 125012-L	●	●		●		12.4	5.0	1.2	1.2	PDL400D2S40 / PDL400D3S40	1
125012-G	●	●		●	●	12.4	5.0	1.2			2
125012-H	●	●		●		12.4	5.0	1.2			3
125012-M			●			12.4	5.0	1.2	3.2		4

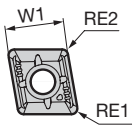
(Insert is the same as the WDX series)

Fig 1 L type



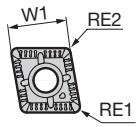
L type: For low feed with chip control

Fig 2 G type



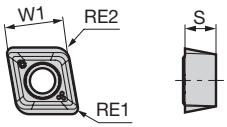
G type: General-purpose

Fig 3 H type



H type: Strong edged

Fig 4 M type



M type: Dedicated for stainless steel

Identification Code

PDL 250 D2 S25

- PDL: Dia. DC (ø25.0)
- D2: Flute Length (L/D) (2D)
- S25: Shank Dia. DCON (ø25.0)

WDXT 07 35 06 -G

- WDXT: Width across Flats (7.5)
- 35: Thickness x 10 (3.5)
- 06: Corner Radius x 10 (0.6)
- -G: Breaker type

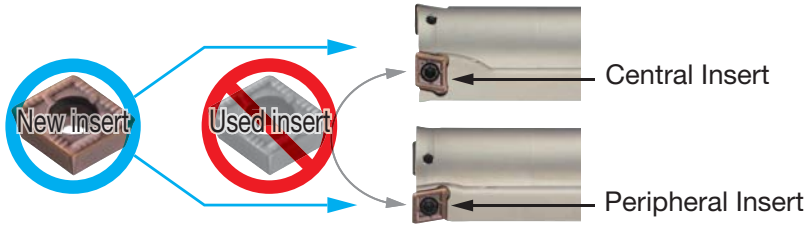
Parts

Applicable Holder	Flat Insert Screw	N·m	Wrench	Wrench
PDL160D2S20 / PDL160D3S20	BFTX0204N	0.5	TRX06	-
PDL200D2S25 / PDL200D3S25	BFTY02206	1.0	-	TRD07
PDL250D2S25 / PDL250D3S25	BFTX02506N	1.5	-	TRD08
PDL320D2S40 / PDL320D3S40	BFTX03584	3.5	-	TRD15
PDL400D2S40 / PDL400D3S40	BFTX0511N	5.0	-	TRD20

N·m Recommended Tightening Torque (N·m)

PDL series for 2D/3D (Internal Coolant Supply)

● Precautions for Mounting Inserts



PDL series: Inserts can be used on either the central or peripheral insert, but only 2 corners are used.
Used peripheral inserts cannot be used as central inserts.
Similarly, central inserts cannot be used as peripheral inserts.

Recommended Cutting Conditions (for 2D) (PDL series)

		Work Material		Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f (feed rate) (mm/rev) (Min. - **Optimum** - Max.) ø16.0	ø20.0, ø25.0	ø32.0	ø40.0
2D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-**180**-240	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.05-**0.08**-0.12
			S15C	125	L	ACP300	130-**170**-220	0.04-**0.08**-0.12	0.04-**0.08**-0.12	0.04-**0.08**-0.13	0.05-**0.10**-0.15
			S45C	190	G	ACP300	100-**150**-200	0.08-**0.13**-0.24	0.08-**0.13**-0.24	0.08-**0.14**-0.26	0.09-**0.16**-0.29
			S45C Hardened	250	G	ACP100	100-**170**-240	0.05-**0.09**-0.14	0.05-**0.09**-0.14	0.05-**0.09**-0.14	0.05-**0.10**-0.17
			S75C	270	G	ACP100	120-**180**-240	0.06-**0.10**-0.17	0.06-**0.10**-0.17	0.06-**0.10**-0.17	0.07-**0.12**-0.19
			S75C Hardened	300	G	ACP100	85-**150**-210	0.05-**0.09**-0.14	0.05-**0.09**-0.14	0.05-**0.09**-0.14	0.05-**0.10**-0.15
		Low-alloy Steel	SCM,SNCM	180	L	ACP300	100-**140**-180	0.05-**0.08**-0.14	0.05-**0.08**-0.14	0.05-**0.08**-0.16	0.06-**0.09**-0.17
			SCM, SNCM Hardened	275	G	ACP100	100-**170**-240	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.07-**0.11**-0.16
			SCM, SNCM Hardened	300	G	ACP100	90-**150**-210	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.07-**0.11**-0.16
			SCM, SNCM Hardened	350	G	ACP100	75-**120**-165	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.06-**0.10**-0.14	0.07-**0.11**-0.16
		High-alloy Steel	SKD,SKT,SKH	200	G	ACP100	120-**180**-240	0.08-**0.12**-0.17	0.08-**0.12**-0.17	0.08-**0.12**-0.18	0.09-**0.12**-0.21
			SKD, SKT, SKH (Sintered)	325	G	ACP100	100-**140**-180	0.06-**0.10**-0.15	0.06-**0.10**-0.15	0.06-**0.11**-0.15	0.07-**0.11**-0.16
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACM300	100-**140**-180	0.06-**0.11**-0.18	0.06-**0.11**-0.18	0.06-**0.12**-0.19	0.07-**0.13**-0.22
			SUS403/Others (Martensitic (hardened))	240	M	ACM300	90-**120**-150	0.06-**0.11**-0.18	0.06-**0.11**-0.18	0.06-**0.12**-0.19	0.07-**0.13**-0.22
			SUS304, SUS316 (Austenitic)	180	M	ACM300	100-**140**-180	0.06-**0.11**-0.18	0.06-**0.11**-0.18	0.06-**0.12**-0.19	0.07-**0.13**-0.22
	K	Cast Iron			H	ACK300	120-**160**-200	0.09-**0.20**-0.32	0.10-**0.22**-0.36	0.11-**0.24**-0.39	0.12-**0.26**-0.44
		Ductile Cast Iron			H	ACK300	90-**120**-150	0.09-**0.20**-0.32	0.10-**0.22**-0.36	0.11-**0.24**-0.39	0.12-**0.26**-0.44
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		200	G	ACP300	25- **50**- 70	0.06-**0.11**-0.18	0.06-**0.11**-0.18	0.06-**0.12**-0.19	0.07-**0.13**-0.22
	N	Aluminum Alloy			G	DL1500	200-**260**-320	0.06-**0.11**-0.17	0.06-**0.11**-0.17	0.06-**0.12**-0.18	0.07-**0.13**-0.20
		Copper Alloy			G	DL1500	180-**230**-280	0.06-**0.11**-0.17	0.06-**0.11**-0.17	0.06-**0.12**-0.18	0.07-**0.13**-0.20

For the P and K grades for which ACP300 and ACK300 inserts are the first recommendation, ACP100 inserts are the second recommendation.
In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

Recommended Cutting Conditions (for 3D) (PDL series)

		Work Material		Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	f (feed rate) (mm/rev) (Min. - **Optimum** - Max.) ø16.0	ø20.0, ø25.0	ø32.0	ø40.0
3D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-**180**-240	0.05-**0.07**-0.10	0.05-**0.07**-0.10	0.05-**0.08**-0.11	0.05-**0.08**-0.12
			S15C	125	L	ACP300	130-**170**-220	0.04-**0.07**-0.10	0.04-**0.07**-0.10	0.04-**0.08**-0.11	0.05-**0.09**-0.12
			S45C	190	G	ACP300	100-**150**-200	0.08-**0.12**-0.20	0.08-**0.12**-0.20	0.08-**0.13**-0.22	0.09-**0.14**-0.24
			S45C Hardened	250	G	ACP100	100-**170**-240	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.05-**0.08**-0.12	0.05-**0.09**-0.14
			S75C	270	G	ACP100	120-**180**-240	0.06-**0.09**-0.14	0.06-**0.09**-0.14	0.06-**0.10**-0.14	0.07-**0.11**-0.17
			S75C Hardened	300	G	ACP100	85-**150**-210	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.05-**0.09**-0.14
		Low-alloy Steel	SCM,SNCM	180	L	ACP300	100-**140**-180	0.05-**0.07**-0.12	0.05-**0.07**-0.12	0.05-**0.08**-0.13	0.06-**0.08**-0.15
			SCM, SNCM Hardened	275	G	ACP100	100-**170**-240	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.07-**0.10**-0.12
			SCM, SNCM Hardened	300	G	ACP100	90-**150**-210	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.07-**0.10**-0.12
			SCM, SNCM Hardened	350	G	ACP100	75-**120**-165	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.07-**0.10**-0.12
		High-alloy Steel	SKD,SKT,SKH	200	G	ACP100	120-**180**-240	0.08-**0.11**-0.14	0.08-**0.12**-0.15	0.08-**0.12**-0.16	0.09-**0.14**-0.18
			SKD, SKT, SKH (Sintered)	325	G	ACP100	100-**140**-180	0.06-**0.09**-0.11	0.06-**0.09**-0.11	0.06-**0.09**-0.11	0.07-**0.10**-0.12
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACM300	100-**140**-180	0.06-**0.10**-0.15	0.06-**0.10**-0.15	0.06-**0.11**-0.16	0.07-**0.12**-0.18
			SUS403/Others (Martensitic (hardened))	240	M	ACM300	90-**120**-150	0.06-**0.10**-0.15	0.06-**0.10**-0.15	0.06-**0.11**-0.16	0.07-**0.12**-0.18
			SUS304, SUS316 (Austenitic)	180	M	ACM300	100-**140**-180	0.06-**0.10**-0.15	0.06-**0.10**-0.15	0.06-**0.11**-0.16	0.07-**0.12**-0.18
	K	Cast Iron			H	ACK300	120-**160**-200	0.09-**0.18**-0.27	0.10-**0.20**-0.30	0.11-**0.22**-0.32	0.12-**0.24**-0.36
		Ductile Cast Iron			H	ACK300	90-**120**-150	0.09-**0.18**-0.27	0.10-**0.20**-0.30	0.11-**0.22**-0.32	0.12-**0.24**-0.36
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		200	G	ACP300	25- **50**- 70	0.06-**0.10**-0.15	0.06-**0.10**-0.15	0.06-**0.11**-0.16	0.07-**0.12**-0.18
	N	Aluminum Alloy			G	DL1500	200-**260**-320	0.06-**0.11**-0.17	0.06-**0.11**-0.17	0.06-**0.12**-0.18	0.07-**0.13**-0.20
		Copper Alloy			G	DL1500	180-**230**-280	0.06-**0.11**-0.17	0.06-**0.11**-0.17	0.06-**0.12**-0.18	0.07-**0.13**-0.20

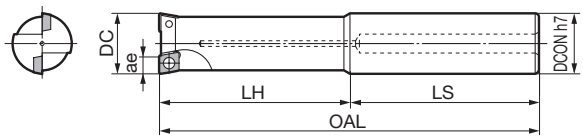
For the P and K grades for which ACP300 and ACK300 inserts are the first recommendation, ACP100 inserts are the second recommendation.
In that case, it is recommended to set the cutting speed vc to 130% and the feed rate f to 75% of the figures in the table above.

PCT series for 3D/5D (Internal Coolant Supply)

Carbon Steel/ Alloy Steel up to 0.26% | Carbon Steel/ Alloy Steel from 0.29% | Hardened Steel up to 45HRC | Stainless Steel | Ti Alloy | Cast Iron | Ductile Cast Iron | Aluminum Alloy | Copper Alloy

CVD Coat | PVD Coat | AURORA Coat DLC | Coolant Hole | 3D | 5D | Indexable

Fig 1



Holder for L/D = 3D Diameter ø16.0 to 40.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	ae max	Neck Length LH	Overall Length OAL	Shank LS	Shank Dia. DCON	Number of Flutes	Applicable Inserts	Fig
16.0	●	**PCT 160D3S16**	4.0	53	123	70	16	**2**	WDXT052504	1
20.0	●	**200D3S20**	5.0	65	145	80	20	**2**	WDXT063006	1
25.0	●	**250D3S25**	6.5	80	160	80	25	**2**	WDXT073506	1
32.0	●	**320D3S32**	8.5	101	191	90	32	**2**	WDXT094008	1
40.0	●	**400D3S42**	11.0	125	225	100	42	**3**	WDXT125012	1

Holder for L/D = 5D Diameter ø16.0 to 40.0mm

Dimensions (mm)

Dia. DC	Stock	Cat. No.	ae max	Neck Length LH	Overall Length OAL	Shank LS	Shank Dia. DCON	Number of Flutes	Applicable Inserts	Fig
16.0	●	**PCT 160D5S16**	4.0	85	155	70	16	**2**	WDXT052504	1
20.0	●	**200D5S20**	5.0	105	185	80	20	**2**	WDXT063006	1
25.0	●	**250D5S25**	6.5	130	210	80	25	**2**	WDXT073506	1
32.0	●	**320D5S32**	8.5	165	255	90	32	**2**	WDXT094008	1
40.0	●	**400D5S42**	11.0	205	305	100	42	**3**	WDXT125012	1

Insert

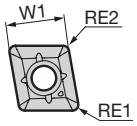
Dimensions (mm)

Grade Classification		Coated Carbide				
Process	High-speed/Light Cutting	PK				N
	General-purpose		P	M		
	Roughing		P		K	

Cat. No.	ACP100	ACP300	ACM300	ACK300	DL1500	Width W1	Thickness S	Corner Radius RE1	Corner Radius RE2	Applicable Holder	Fig
WDXT 052504-L	●	●		●		5.0	2.5	0.4	0.4	PCT160D3S16 / PCT160D5S16	1
052504-G	●	●		●	●	5.0	2.5	0.4	0.4		2
052504-H	●	●		●		5.0	2.5	0.4	0.4		3
052504-M			●			5.0	2.5	0.4	1.0		4
WDXT 063006-L	●	●		●		6.0	3.0	0.6	0.6	PCT200D3S20 / PCT200D5S20	1
063006-G	●	●		●	●	6.0	3.0	0.6	0.6		2
063006-H	●	●		●		6.0	3.0	0.6	0.6		3
063006-M			●			6.0	3.0	0.6	1.4		4
WDXT 073506-L	●	●		●		7.5	3.5	0.6	0.6	PCT250D3S25 / PCT250D5S25	1
073506-G	●	●		●	●	7.5	3.5	0.6	0.6		2
073506-H	●	●		●		7.5	3.5	0.6	0.6		3
073506-M			●			7.5	3.5	0.6	1.6		4
WDXT 094008-L	●	●		●		9.6	4.0	0.8	0.8	PCT320D3S32 / PCT320D5S32	1
094008-G	●	●		●	●	9.6	4.0	0.8	0.8		2
094008-H	●	●		●		9.6	4.0	0.8	0.8		3
094008-M			●			9.6	4.0	0.8	2.4		4
WDXT 125012-L	●	●		●		12.4	5.0	1.2	1.2	PCT400D3S42 / PCT400D5S42	1
125012-G	●	●		●	●	12.4	5.0	1.2	1.2		2
125012-H	●	●		●		12.4	5.0	1.2	1.2		3
125012-M			●			12.4	5.0	1.2	3.2		4

Fig 1

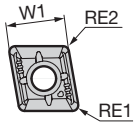
L type



L type: For low feed with chip control

Fig 2

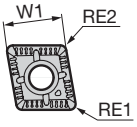
G type



G type: General-purpose

Fig 3

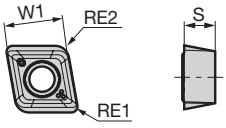
H type



H type: Strong edged

Fig 4

M type



M type: Dedicated for Stainless Steel

PCT series: 2 corners can be used for the peripheral inserts only. When using the M type chipbreaker, the ae max is 20% shorter.
(Insert is the same as the WDX series)

Identification Code

PCT 250 D3 S25

- PCT
- 250 — Dia. DC (ø25.0)
- D3 — Flute Length (L/D) (3D)
- S25 — Shank Dia. DCON (ø25.0)

WDXT 07 35 06 -G

- WDXT
- 07 — Width across Flats (7.5)
- 35 — Thickness x 10 (3.5)
- 06 — Corner Radius x 10 (0.6)
- -G — Breaker type

Parts

Applicable Holder	Flat Insert Screw	N·m	Wrench	Wrench
PCT160D3S16 / PCT160D5S16	BFTX0204N	0.5	TRX06	-
PCT200D3S20 / PCT200D5S20	BFTY02206	1.0	-	TRD07
PCT250D3S25 / PCT250D5S25	BFTX02506N	1.5	-	TRD08
PCT320D3S32 / PCT320D5S32	BFTX03584	3.5	-	TRD15
PCT400D3S42 / PCT400D5S42	BFTX0511N	5.0	-	TRD20

N·m Recommended Tightening Torque (N·m)

PCT series for 3D/5D (Internal Coolant Supply)

Recommended Cutting Conditions (for 3D) (PCT series)

		Work Material		Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	fz (feed rate) (mm/t) (Min. - **Optimum** - Max.) ø16.0	ø20.0, ø25.0	ø32.0	ø40.0
3D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-**180**-240	0.05-**0.07**-0.10	0.05-**0.07**-0.10	0.05-**0.07**-0.10	0.05-**0.08**-0.10
			S15C	125	L	ACP300	130-**170**-220	0.04-**0.07**-0.09	0.04-**0.07**-0.09	0.04-**0.07**-0.09	0.05-**0.08**-0.10
			S45C	190	G	ACP300	100-**150**-200	0.08-**0.11**-0.17	0.08-**0.11**-0.17	0.08-**0.12**-0.18	0.09-**0.14**-0.21
			S45C Hardened	250	G	ACP100	100-**170**-240	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11	0.05-**0.08**-0.11
			S75C	270	G	ACP100	120-**180**-240	0.06-**0.08**-0.11	0.06-**0.08**-0.11	0.06-**0.09**-0.13	0.07-**0.11**-0.14
			S75C Hardened	300	G	ACP100	85-**150**-210	0.05-**0.07**-0.09	0.05-**0.07**-0.09	0.05-**0.08**-0.10	0.05-**0.08**-0.11
		Low-alloy Steel	SCM,SNCM	180	L	ACP300	100-**140**-180	0.05-**0.07**-0.10	0.05-**0.07**-0.10	0.05-**0.07**-0.11	0.06-**0.08**-0.12
			SCM, SNCM Hardened	275	G	ACP100	100-**170**-240	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11
			SCM, SNCM Hardened	300	G	ACP100	90-**150**-210	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11
			SCM, SNCM Hardened	350	G	ACP100	75-**120**-165	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11
		High-alloy Steel	SKD,SKT,SKH	200	G	ACP100	120-**180**-240	0.06-**0.10**-0.13	0.07-**0.11**-0.14	0.07-**0.11**-0.15	0.08-**0.12**-0.16
			SKD, SKT, SKH (Sintered)	325	G	ACP100	100-**140**-180	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.10	0.05-**0.08**-0.11
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACM300	100-**140**-180	0.06-**0.10**-0.13	0.06-**0.10**-0.13	0.06-**0.10**-0.14	0.07-**0.11**-0.15
			SUS403/Others (Martensitic (hardened))	240	M	ACM300	90-**120**-150	0.06-**0.10**-0.13	0.06-**0.10**-0.13	0.06-**0.10**-0.14	0.07-**0.11**-0.15
			SUS304, SUS316 (Austenitic)	180	M	ACM300	100-**140**-180	0.06-**0.10**-0.13	0.06-**0.10**-0.13	0.06-**0.10**-0.14	0.07-**0.11**-0.15
	K	Cast Iron			H	ACK300	120-**160**-200	0.09-**0.17**-0.23	0.10-**0.19**-0.26	0.11-**0.21**-0.28	0.12-**0.23**-0.31
		Ductile Cast Iron			H	ACK300	90-**120**-150	0.09-**0.17**-0.23	0.10-**0.19**-0.26	0.11-**0.21**-0.28	0.12-**0.23**-0.31
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		200	G	ACP300	25- **50**- 70	0.06-**0.10**-0.13	0.06-**0.10**-0.13	0.06-**0.10**-0.14	0.07-**0.11**-0.15
	N	Aluminum Alloy			G	DL1500	200-**260**-320	0.05-**0.10**-0.15	0.05-**0.10**-0.15	0.06-**0.11**-0.16	0.06-**0.12**-0.18
		Copper Alloy			G	DL1500	180-**230**-280	0.05-**0.10**-0.15	0.05-**0.10**-0.15	0.06-**0.11**-0.16	0.06-**0.12**-0.18

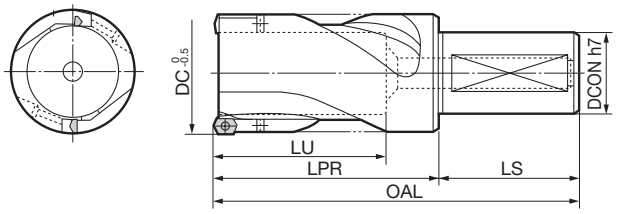
For the P and K grades for which ACP300 and ACK300 inserts are the first recommendation, ACP100 inserts are the second recommendation.
In that case, it is recommended to set the cutting speed vc to 130% and the feed rate fz to 75% of the figures in the table above.

Recommended Cutting Conditions (for 5D) (PCT series)

		Work Material		Workpiece Hardness HB	Recommended Chipbreaker	Recommended Insert Grade	vc Cutting Speed (m/min)	fz (feed rate) (mm/t) (Min. - **Optimum** - Max.) ø16.0	ø20.0, ø25.0	ø32.0	ø40.0
5D	P	Steel, Carbon Steel	SS400	125	G	ACP300	120-**180**-240	0.05-**0.06**-0.09	0.05-**0.06**-0.09	0.05-**0.06**-0.09	0.05-**0.07**-0.09
			S15C	125	L	ACP300	130-**170**-220	0.04-**0.06**-0.08	0.04-**0.06**-0.08	0.04-**0.06**-0.08	0.05-**0.07**-0.09
			S45C	190	G	ACP300	100-**150**-200	0.07-**0.10**-0.15	0.07-**0.10**-0.15	0.08-**0.11**-0.17	0.09-**0.12**-0.19
			S45C Hardened	250	G	ACP100	100-**170**-240	0.04-**0.07**-0.08	0.04-**0.07**-0.08	0.05-**0.07**-0.09	0.05-**0.08**-0.11
			S75C	270	G	ACP100	120-**180**-240	0.05-**0.08**-0.11	0.05-**0.08**-0.11	0.06-**0.08**-0.11	0.07-**0.09**-0.13
			S75C Hardened	300	G	ACP100	85-**150**-210	0.04-**0.07**-0.08	0.04-**0.07**-0.08	0.05-**0.07**-0.09	0.05-**0.08**-0.10
		Low-alloy Steel	SCM,SNCM	180	L	ACP300	100-**140**-180	0.05-**0.06**-0.09	0.05-**0.06**-0.09	0.05-**0.06**-0.10	0.05-**0.07**-0.11
			SCM, SNCM Hardened	275	G	ACP100	100-**170**-240	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.05-**0.07**-0.10
			SCM, SNCM Hardened	300	G	ACP100	90-**150**-210	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.05-**0.07**-0.10
			SCM, SNCM Hardened	350	G	ACP100	75-**120**-165	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.05-**0.07**-0.10
		High-alloy Steel	SKD,SKT,SKH	200	G	ACP100	120-**180**-240	0.05-**0.08**-0.12	0.06-**0.09**-0.12	0.06-**0.09**-0.13	0.07-**0.10**-0.14
			SKD, SKT, SKH (Sintered)	325	G	ACP100	100-**140**-180	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09	0.04-**0.06**-0.09
	M	Stainless Steel	SUS403/Others (Martensitic/Ferritic)	200	M	ACM300	100-**140**-180	0.05-**0.09**-0.11	0.05-**0.09**-0.11	0.06-**0.09**-0.12	0.06-**0.10**-0.14
			SUS403/Others (Martensitic (hardened))	240	M	ACM300	90-**120**-150	0.05-**0.09**-0.11	0.05-**0.09**-0.11	0.06-**0.09**-0.12	0.06-**0.10**-0.14
			SUS304, SUS316 (Austenitic)	180	M	ACM300	100-**140**-180	0.05-**0.09**-0.11	0.05-**0.09**-0.11	0.06-**0.09**-0.12	0.06-**0.10**-0.14
	K	Cast Iron			H	ACK300	120-**160**-200	0.08-**0.15**-0.21	0.09-**0.17**-0.23	0.09-**0.18**-0.25	0.11-**0.20**-0.28
		Ductile Cast Iron			H	ACK300	90-**120**-150	0.08-**0.15**-0.21	0.09-**0.17**-0.23	0.09-**0.18**-0.25	0.11-**0.20**-0.28
	S	Exotic Alloy (Heat-Resistant Alloy, Super Alloy, Titanium Alloy, etc.)		200	G	ACP300	25- **50**- 70	0.05-**0.09**-0.11	0.05-**0.09**-0.11	0.06-**0.09**-0.12	0.06-**0.10**-0.14
	N	Aluminum Alloy			G	DL1500	200-**260**-320	0.05-**0.10**-0.15	0.05-**0.10**-0.15	0.06-**0.11**-0.16	0.06-**0.12**-0.18
		Copper Alloy			G	DL1500	180-**230**-280	0.05-**0.10**-0.15	0.05-**0.10**-0.15	0.06-**0.11**-0.16	0.06-**0.12**-0.18

For the P and K grades for which ACP300 and ACK300 inserts are the first recommendation, ACP100 inserts are the second recommendation.
In that case, it is recommended to set the cutting speed vc to 130% and the feed rate fz to 75% of the figures in the table above.

Fig 1



Holder

Dimensions (mm)

Dia. DC	Stock	Cat. No.	Effective Length LU	Overhang Length LPR	Overall Length OAL	Shank LS	Shank Dia. DCON	Fig
50 to 65		**TCS 050 to 065**	115 to 145	140 to 180	205 to 245	65	40	1
66 to 80		**066 to 080**	145 to 175	180 to 215	245 to 280	65	40	1
81 to 85		**081 to 085**	175 to 185	215 to 230	290 to 305	75	50	1
86 to 95		**086 to 095**	185 to 205	230 to 255	305 to 330	75	50	1
96 to 105		**096 to 105**	205 to 225	255 to 280	330 to 355	75	50	1
106 to 110		**106 to 110**	225 to 235	280 to 290	355 to 365	75	50	1

Other than the above, manufacturing up to DC = 200mm is possible.
Specify all dimensions and the mounting part shape when ordering.

Insert

Dimensions (mm)

Grade Classification		Coated Carbide	Cemented Carbide
Process	High-speed/Light Cutting		
	General-purpose		P
	Roughing		

Cat. No.	AC325	A30N	Applicable Holder	Fig
WPG 10R			For outer blade	1
10L			For inner blade	1

Fig 1

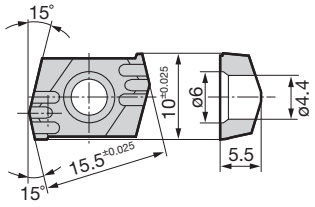


Figure shows WPG10R

Parts

Applicable Holders	Cartridges Stock	Cartridges For outer blade	Cap Screw	Set Screw	Cartridges Stock	Cartridges For inner blade	Cap Screw	Axial Adjustment Screw	Flat Insert Screw	N·m	Wrench
TCS 050 to 055		TU050055K1	BX 0408	BT 0306		TU050055K2	BX 0408	AJM4FT	BFTX 0409N	**3.0**	TRX 15
TCS 056 to 065		TU055065K1	BX 0410	BT 0306		TU055065K2	BX 0410	AJM4FT	BFTX 0409N	**3.0**	TRX 15
TCS 066 to 075		TU065075K1	BX 0414	BT 0306		TU065075K2	BX 0414	AJM4FT	BFTX 0409N	**3.0**	TRX 15
TCS 076 to 085		TU075085K1	BX 0418	BT 0306		TU075085K2	BX 0418	AJM4FT	BFTX 0409N	**3.0**	TRX 15
TCS 086 to 095		TU085095K1	BX 0418	BT 0306		TU085105K2	BX 0425	AJM4FT	BFTX 0409N	**3.0**	TRX 15
TCS 096 to 105		TU095105K1	BX 0425	BT 0306		TU085105K2	BX 0425	AJM4FT	BFTX 0409N	**3.0**	TRX 15
TCS 106 to 115		TU105135K1	BX 0430	BT 0306		TU105125K2	BX 0425	AJM4FT	BFTX 0409N	**3.0**	TRX 15

Recommended Cutting Conditions

(vc: Cutting Speed m/min, f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Mild Steel Alloy Steel (Below 320HB)	Mild Steel Alloy Steel General Steel (Below 250HB)	Die Steel (250HB)	Ductile Cast Iron	Cast Iron
ø110	vc	70 - **90** - 110	90 - **110** - 130	50 - **70** - 80	100 - **120** - 140	100 - **120** - 140
	f	0.05 - **0.1** - 0.15	0.05 - **0.1** - 0.15	0.05 - **0.1** - 0.15	0.1 - **0.15** - 0.2	0.15 - **0.2** - 0.25

Min. - **Optimum** - Max.

N·m Recommended Tightening Torque (N·m)

MEMO

SSR series

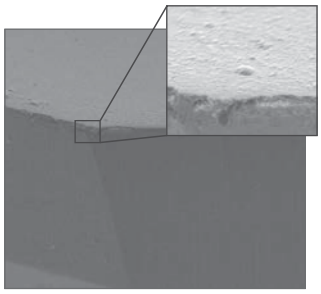
■ Features

- High efficiency and high-precision reaming achieved through excellent cutting edge quality and gradual right-hand helix flutes
- Dedicated coating for reamers enables machining with long, stable tool life

● Stable Hole Diameter

· Optimised back taper reduces frictional resistance and hole diameter is stable due to machined finish

SSR series



Conventional Tool A

● Smooth Chip Evacuation

· A balanced design combining sharpness and cutting edge strength with gradual right-hand helix flutes

Work Material	: S50C Chips
Tool	: Diameter ø8mm
Cutting Conditions	: vc = 120m/min f = 1.2mm/rev ap = 0.1mm

Work Material	: S50C Chips
Tool	: Diameter ø8mm
Cutting Conditions	: vc = 20m/min f = 0.09mm/rev ap = 0.1mm

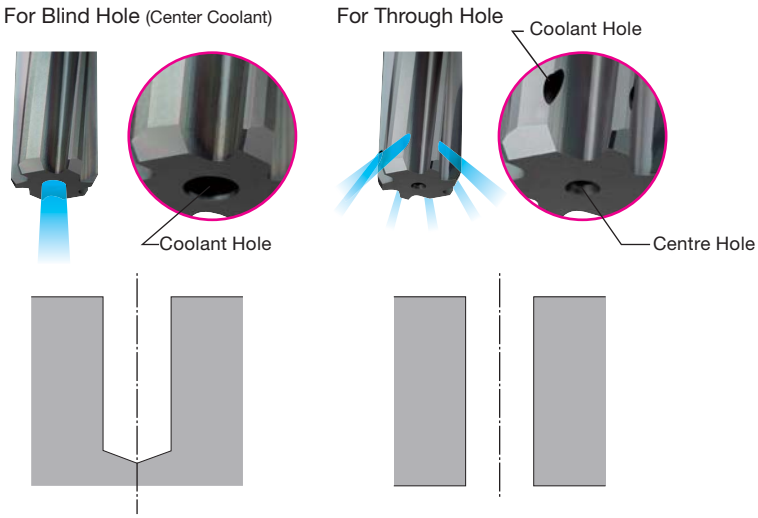
● High-precision Reaming

· Excellent cutting edge quality free of microchipping realizes good hole surface quality

● Long, Stable Tool Life: Dedicated Coating for Reamers

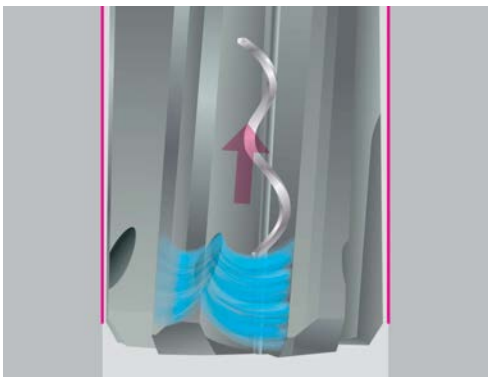
· High quality, high hardness and high strength coating layer for excellent wear resistance and thermal resistance

● Coolant Mechanism by Application



Unique coolant supply mechanism which does not hamper chip evacuation

(for through hole)

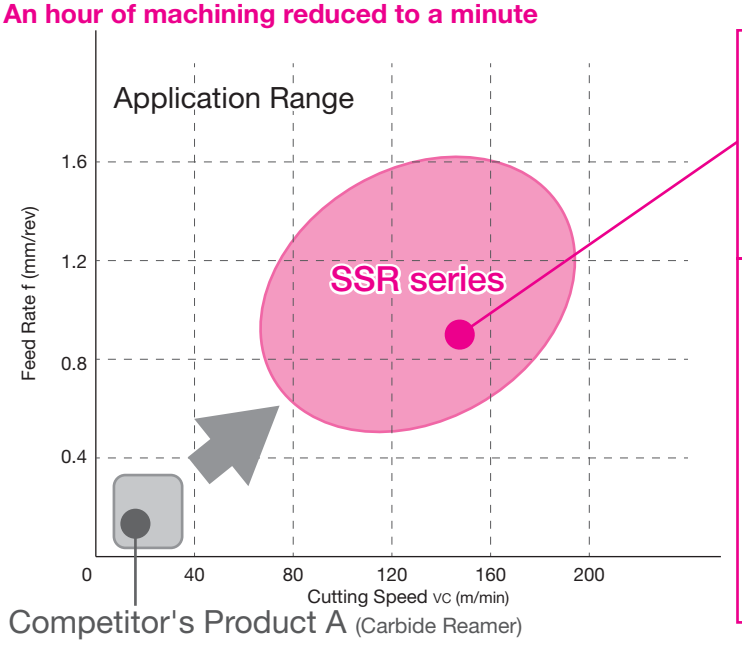


Coolant is supplied to the cutting edge from the flank side through the inner wall of the hole achieving smooth chip evacuation without obstruction

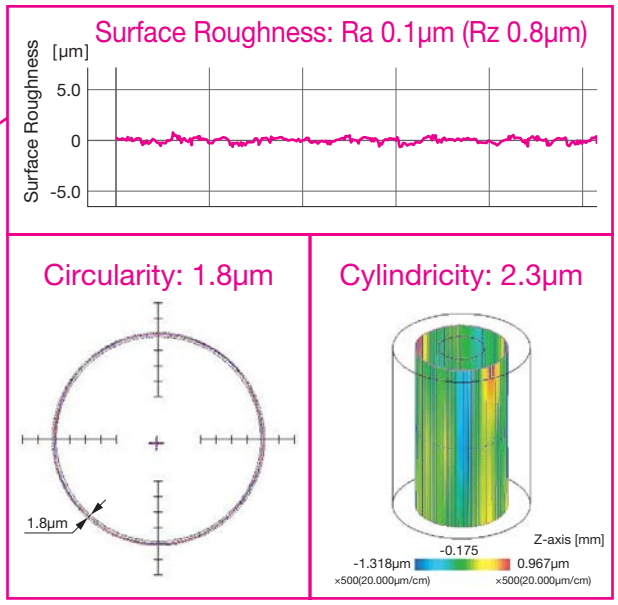
■ Cutting Performance

● Machining Efficiency Comparison

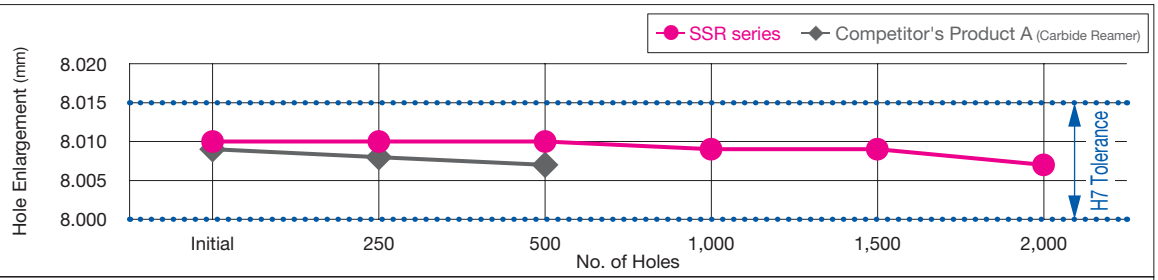
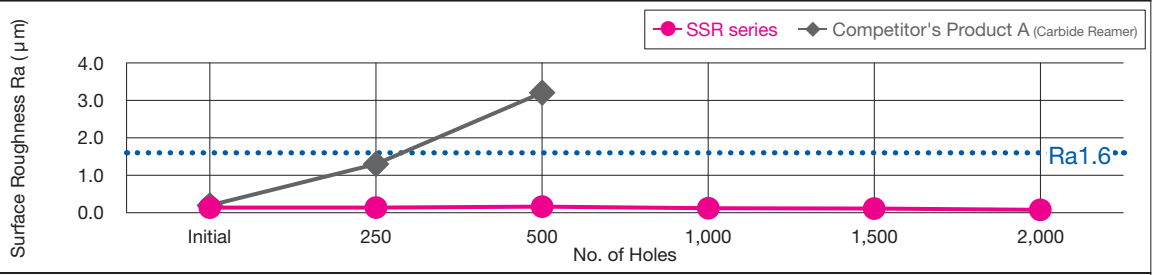
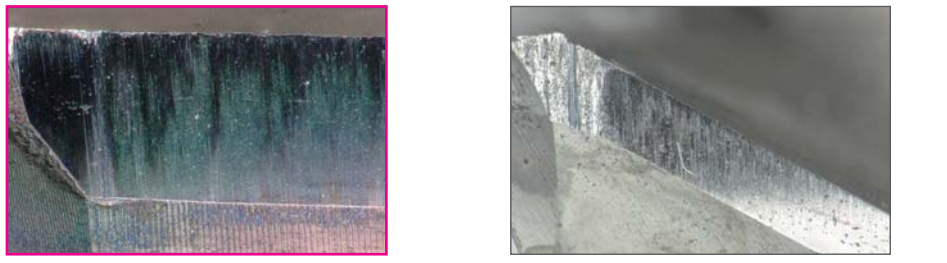
Realizes 60 times or higher machining efficiency
An hour of machining reduced to a minute



● Reaming Precision



● Tool Life Comparison

Hole Diameter Shift	
Surface Roughness Shift (Ra)	
Cutting Edge Failure	

Machine : BT30 (Internal Coolant Supply) Work Material: S50C Tool: SSR08000H7S (ø8mm H7 tolerance hole) H = 16mm)
Cutting Conditions : SSR series vc = 150m/min f = 0.90mm/rev vf = 5,374mm/min ap = 0.1mm (Depth of Cut/Radius)
Competitor's Product A vc = 15m/min f = 0.15mm/rev vf = 89.6mm/min ap = 0.1mm (Depth of Cut/Radius)

SSR series For H7 Tolerance Hole (Through Hole)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron

PVD Coat | Coolant Hole

*Refer to N37 for the tolerance of h6 and N37 for H7

Fig 1

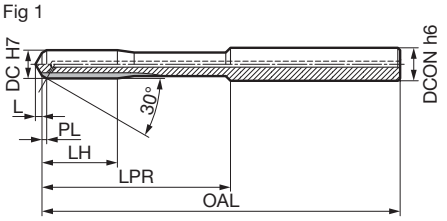
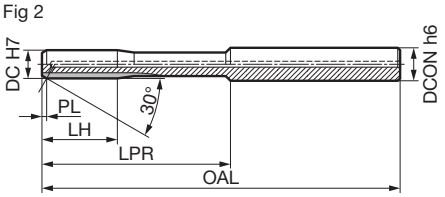


Fig 2



Diameter ø3.0 to 12.0mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Tip L	Number of Flutes	Fig
3.0	+0.008 +0.004	●	**SSR 03000H7T**	68	4	40	12	0.5	0.7	4	1
3.5		●	**SSR 03500H7T**	68	4	40	12	0.5	0.9	4	1
4.0		●	**04000H7T**	76	5	40	12	0.5	1.0	4	1
4.5	+0.010	●	**04500H7T**	76	5	40	12	0.5	1.2	4	1
5.0	+0.005	●	**05000H7T**	76	6	40	12	0.5	1.3	4	1
5.5		●	**05500H7T**	76	6	40	12	0.5	1.5	4	1
6.0		●	**06000H7T**	76	7	40	16	1.0	—	4	2
6.5		●	**SSR 06500H7T**	76	7	40	16	1.0	—	4	2
7.0		●	**07000H7T**	101	8	65	16	1.0	—	6	2
7.5		●	**07500H7T**	101	8	65	16	1.0	—	6	2
8.0	+0.012	●	**08000H7T**	101	9	65	19	1.0	—	6	2
8.5	+0.006	●	**08500H7T**	101	9	65	19	1.0	—	6	2
9.0		●	**09000H7T**	101	10	65	19	1.0	—	6	2
9.5		●	**09500H7T**	101	10	65	19	1.0	—	6	2
10.0		●	**10000H7T**	130	11	85	22	1.0	—	6	2
10.5		●	**SSR 10500H7T**	130	11	85	22	1.0	—	6	2
11.0	+0.015	●	**11000H7T**	130	12	85	22	1.0	—	6	2
11.5	+0.008	●	**11500H7T**	130	12	85	22	1.0	—	6	2
12.0		●	**12000H7T**	130	13	85	22	1.0	—	6	2

Grade: ACR40

Recommended Cutting Conditions J156

Identification Code

SSR — Series Code

03500 — Dia.

H7T — Hole Tolerance for Through Hole

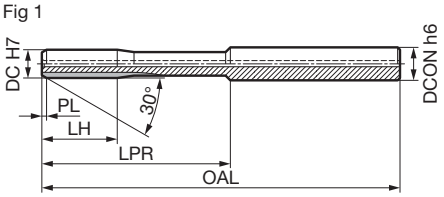
SSR series For H7 Tolerance Hole (Blind Hole)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron

PVD Coat | Coolant Hole

*Refer to N37 for the tolerance of h6 and N37 for H7

Fig 1



Diameter ø3.0 to 12.0mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Number of Flutes	Fig
3.0	+0.008 +0.004	●	**SSR 03000H7S**	68	4	40	12	0.5	4	1
3.5		●	**SSR 03500H7S**	68	4	40	12	0.5	4	1
4.0		●	**04000H7S**	76	5	40	12	0.5	4	1
4.5	+0.010	●	**04500H7S**	76	5	40	12	0.5	4	1
5.0	+0.005	●	**05000H7S**	76	6	40	12	0.5	4	1
5.5		●	**05500H7S**	76	6	40	12	0.5	4	1
6.0		●	**06000H7S**	76	7	40	16	1.0	4	1
6.5		●	**SSR 06500H7S**	76	7	40	16	1.0	4	1
7.0		●	**07000H7S**	101	8	65	16	1.0	6	1
7.5		●	**07500H7S**	101	8	65	16	1.0	6	1
8.0	+0.012	●	**08000H7S**	101	9	65	19	1.0	6	1
8.5	+0.006	●	**08500H7S**	101	9	65	19	1.0	6	1
9.0		●	**09000H7S**	101	10	65	19	1.0	6	1
9.5		●	**09500H7S**	101	10	65	19	1.0	6	1
10.0		●	**10000H7S**	130	11	85	22	1.0	6	1
10.5		●	**SSR 10500H7S**	130	11	85	22	1.0	6	1
11.0	+0.015	●	**11000H7S**	130	12	85	22	1.0	6	1
11.5	+0.008	●	**11500H7S**	130	12	85	22	1.0	6	1
12.0		●	**12000H7S**	130	13	85	22	1.0	6	1

Grade: ACR40

Recommended Cutting Conditions J156

Identification Code

SSR Series Code

03500 Dia.

H7S Hole Tolerance for Blind Hole

SSR series (Through Hole)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron

PVD Coat | Coolant Hole

*Refer to N36 for the tolerance of h6

Fig 1

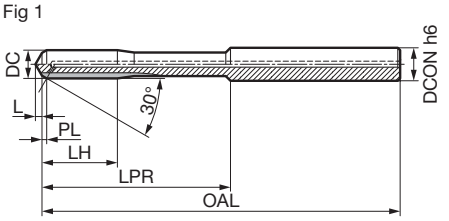
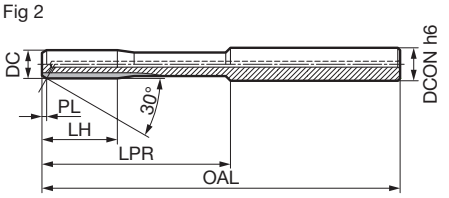


Fig 2



Diameter ø2.97 to 8.99mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Tip L	Number of Flutes	Fig
2.97	+0.005 0	●	SSR 02970JT	68	4	40	12	0.5	0.7	4	1
2.98		●	02980JT	68	4	40	12	0.5	0.7	4	1
2.99		●	02990JT	68	4	40	12	0.5	0.7	4	1
3.00	+0.005 0	●	SSR 03000JT	68	4	40	12	0.5	0.7	4	1
3.01		●	03010JT	68	4	40	12	0.5	0.8	4	1
3.02		●	03020JT	68	4	40	12	0.5	0.8	4	1
3.03		●	03030JT	68	4	40	12	0.5	0.8	4	1
3.97		●	03970JT	76	5	40	12	0.5	1.0	4	1
3.98		●	03980JT	76	5	40	12	0.5	1.0	4	1
3.99		●	03990JT	76	5	40	12	0.5	1.0	4	1
4.00	+0.005 0	●	SSR 04000JT	76	5	40	12	0.5	1.0	4	1
4.01		●	04010JT	76	5	40	12	0.5	1.0	4	1
4.02		●	04020JT	76	5	40	12	0.5	1.0	4	1
4.03		●	04030JT	76	5	40	12	0.5	1.0	4	1
4.97		●	04970JT	76	6	40	12	0.5	1.3	4	1
4.98		●	04980JT	76	6	40	12	0.5	1.3	4	1
4.99		●	04990JT	76	6	40	12	0.5	1.3	4	1
5.00	+0.005 0	●	SSR 05000JT	76	6	40	12	0.5	1.3	4	1
5.01		●	05010JT	76	6	40	12	0.5	1.3	4	1
5.02		●	05020JT	76	6	40	12	0.5	1.3	4	1
5.03		●	05030JT	76	6	40	12	0.5	1.3	4	1
5.97		●	05970JT	76	7	40	16	1.0	—	4	2
5.98		●	05980JT	76	7	40	16	1.0	—	4	2
5.99		●	05990JT	76	7	40	16	1.0	—	4	2
6.00	+0.005 0	●	SSR 06000JT	76	7	40	16	1.0	—	4	2
6.01		●	06010JT	76	7	40	16	1.0	—	4	2
6.02		●	06020JT	76	7	40	16	1.0	—	4	2
6.03		●	06030JT	76	7	40	16	1.0	—	4	2
6.97		●	06970JT	101	8	65	16	1.0	—	6	2
6.98		●	06980JT	101	8	65	16	1.0	—	6	2
6.99		●	06990JT	101	8	65	16	1.0	—	6	2
7.00	+0.005 0	●	SSR 07000JT	101	8	65	16	1.0	—	6	2
7.01		●	07010JT	101	8	65	16	1.0	—	6	2
7.02		●	07020JT	101	8	65	16	1.0	—	6	2
7.03		●	07030JT	101	8	65	16	1.0	—	6	2
7.97		●	07970JT	101	9	65	19	1.0	—	6	2
7.98		●	07980JT	101	9	65	19	1.0	—	6	2
7.99		●	07990JT	101	9	65	19	1.0	—	6	2
8.00	+0.005 0	●	SSR 08000JT	101	9	65	19	1.0	—	6	2
8.01		●	08010JT	101	9	65	19	1.0	—	6	2
8.02		●	08020JT	101	9	65	19	1.0	—	6	2
8.03		●	08030JT	101	9	65	19	1.0	—	6	2
8.97		●	08970JT	101	10	65	19	1.0	—	6	2
8.98		●	08980JT	101	10	65	19	1.0	—	6	2
8.99		●	08990JT	101	10	65	19	1.0	—	6	2

Grade: ACR40

Recommended Cutting Conditions J156

Diameter ø9.00 to 12.00mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Tip L	Number of Flutes	Fig
9.00	+0.005 0	●	SSR 09000JT	101	10	65	19	1.0	—	6	2
9.01		●	09010JT	101	10	65	19	1.0	—	6	2
9.02		●	09020JT	101	10	65	19	1.0	—	6	2
9.03		●	09030JT	101	10	65	19	1.0	—	6	2
9.97		●	09970JT	130	11	85	22	1.0	—	6	2
9.98		●	09980JT	130	11	85	22	1.0	—	6	2
9.99		●	09990JT	130	11	85	22	1.0	—	6	2
10.00	+0.005 0	●	SSR 10000JT	130	11	85	22	1.0	—	6	2
10.01		●	10010JT	130	11	85	22	1.0	—	6	2
10.02		●	10020JT	130	11	85	22	1.0	—	6	2
10.03		●	10030JT	130	11	85	22	1.0	—	6	2
10.97		●	10970JT	130	12	85	22	1.0	—	6	2
10.98		●	10980JT	130	12	85	22	1.0	—	6	2
10.99		●	10990JT	130	12	85	22	1.0	—	6	2
11.00	+0.005 0	●	SSR 11000JT	130	12	85	22	1.0	—	6	2
11.01		●	11010JT	130	12	85	22	1.0	—	6	2
11.02		●	11020JT	130	12	85	22	1.0	—	6	2
11.03		●	11030JT	130	12	85	22	1.0	—	6	2
11.97		●	11970JT	130	13	85	22	1.0	—	6	2
11.98		●	11980JT	130	13	85	22	1.0	—	6	2
11.99		●	11990JT	130	13	85	22	1.0	—	6	2
12.00		●	12000JT	130	13	85	22	1.0	—	6	2

Grade: ACR40

Recommended Cutting Conditions J156

Identification Code

SSR 03000 **JT**

- SSR: Series Code
- 03000: Dia.
- JT: For Through Hole

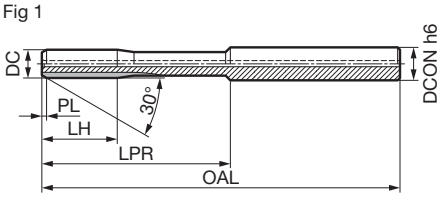
SSR series (Blind Hole)

Carbon Steel/ Alloy Steel up to 0.28% | Carbon Steel/ Alloy Steel from 0.29% | Tempered Steel | Hardened Steel up to 45HRC | Cast Iron | Ductile Cast Iron

PVD Coat | Coolant Hole

*Refer to N36 for the tolerance of h6

Fig 1



Diameter ø2.97 to 8.99mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Number of Flutes	Fig
2.97	+0.005 0	●	SSR 02970JS	68	4	40	12	0.5	4	1
2.98		●	02980JS	68	4	40	12	0.5	4	1
2.99		●	02990JS	68	4	40	12	0.5	4	1
3.00	+0.005 0	●	SSR 03000JS	68	4	40	12	0.5	4	1
3.01		●	03010JS	68	4	40	12	0.5	4	1
3.02		●	03020JS	68	4	40	12	0.5	4	1
3.03		●	03030JS	68	4	40	12	0.5	4	1
3.97		●	03970JS	76	5	40	12	0.5	4	1
3.98		●	03980JS	76	5	40	12	0.5	4	1
3.99		●	03990JS	76	5	40	12	0.5	4	1
4.00	+0.005 0	●	SSR 04000JS	76	5	40	12	0.5	4	1
4.01		●	04010JS	76	5	40	12	0.5	4	1
4.02		●	04020JS	76	5	40	12	0.5	4	1
4.03		●	04030JS	76	5	40	12	0.5	4	1
4.97		●	04970JS	76	6	40	12	0.5	4	1
4.98		●	04980JS	76	6	40	12	0.5	4	1
4.99		●	04990JS	76	6	40	12	0.5	4	1
5.00	+0.005 0	●	SSR 05000JS	76	6	40	12	0.5	4	1
5.01		●	05010JS	76	6	40	12	0.5	4	1
5.02		●	05020JS	76	6	40	12	0.5	4	1
5.03		●	05030JS	76	6	40	12	0.5	4	1
5.97		●	05970JS	76	7	40	16	1.0	4	1
5.98		●	05980JS	76	7	40	16	1.0	4	1
5.99		●	05990JS	76	7	40	16	1.0	4	1
6.00	+0.005 0	●	SSR 06000JS	76	7	40	16	1.0	4	1
6.01		●	06010JS	76	7	40	16	1.0	4	1
6.02		●	06020JS	76	7	40	16	1.0	4	1
6.03		●	06030JS	76	7	40	16	1.0	4	1
6.97		●	06970JS	101	8	65	16	1.0	6	1
6.98		●	06980JS	101	8	65	16	1.0	6	1
6.99		●	06990JS	101	8	65	16	1.0	6	1
7.00	+0.005 0	●	SSR 07000JS	101	8	65	16	1.0	6	1
7.01		●	07010JS	101	8	65	16	1.0	6	1
7.02		●	07020JS	101	8	65	16	1.0	6	1
7.03		●	07030JS	101	8	65	16	1.0	6	1
7.97		●	07970JS	101	9	65	19	1.0	6	1
7.98		●	07980JS	101	9	65	19	1.0	6	1
7.99		●	07990JS	101	9	65	19	1.0	6	1
8.00	+0.005 0	●	SSR 08000JS	101	9	65	19	1.0	6	1
8.01		●	08010JS	101	9	65	19	1.0	6	1
8.02		●	08020JS	101	9	65	19	1.0	6	1
8.03		●	08030JS	101	9	65	19	1.0	6	1
8.97		●	08970JS	101	10	65	19	1.0	6	1
8.98		●	08980JS	101	10	65	19	1.0	6	1
8.99		●	08990JS	101	10	65	19	1.0	6	1

Grade: ACR40

Recommended Cutting Conditions J156

Diameter ø9.00 to 12.00mm

Dimensions (mm)

Dia. DC	Dia. Tolerance	Stock	Cat. No.	Overall Length OAL	Shank Dia. DCON	Neck Length LPR	Cutting Edge Length LH	Engagement Length PL	Number of Flutes	Fig
9.00	+0.005 0	●	SSR 09000JS	101	10	65	19	1.0	6	1
9.01		●	09010JS	101	10	65	19	1.0	6	1
9.02		●	09020JS	101	10	65	19	1.0	6	1
9.03		●	09030JS	101	10	65	19	1.0	6	1
9.97		●	09970JS	130	11	85	22	1.0	6	1
9.98		●	09980JS	130	11	85	22	1.0	6	1
9.99		●	09990JS	130	11	85	22	1.0	6	1
10.00	+0.005 0	●	SSR 10000JS	130	11	85	22	1.0	6	1
10.01		●	10010JS	130	11	85	22	1.0	6	1
10.02		●	10020JS	130	11	85	22	1.0	6	1
10.03		●	10030JS	130	11	85	22	1.0	6	1
10.97		●	10970JS	130	12	85	22	1.0	6	1
10.98		●	10980JS	130	12	85	22	1.0	6	1
10.99		●	10990JS	130	12	85	22	1.0	6	1
11.00	+0.005 0	●	SSR 11000JS	130	12	85	22	1.0	6	1
11.01		●	11010JS	130	12	85	22	1.0	6	1
11.02		●	11020JS	130	12	85	22	1.0	6	1
11.03		●	11030JS	130	12	85	22	1.0	6	1
11.97		●	11970JS	130	13	85	22	1.0	6	1
11.98		●	11980JS	130	13	85	22	1.0	6	1
11.99		●	11990JS	130	13	85	22	1.0	6	1
12.00		●	12000JS	130	13	85	22	1.0	6	1

Grade: ACR40

Recommended Cutting Conditions J156

Identification Code

SSR 03000 **JS**

- SSR — Series Code
- 03000 — Dia.
- JS — For Blind Hole

■ Recommended Cutting Conditions

Work Material		Carbon Steel for Mechanical Structures Alloy Steel for Mechanical Structures General Structural Steel		Cast Iron		Ductile Cast Iron		Hardened Steel Up to 45HRC		Depth of Cut ap (mm/radius)
Cutting Speed		80 to 180m/min		60 to 140m/min		60 to 180m/min		20 to 60m/min		
Diameter DC (mm)	Number of Flutes	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	Spindle Speed (min^{-1})	Feed Rate (mm/rev)	
ø3	4	8,400-19,100	0.5-0.8	6,300-14,800	0.5-0.8	6,300-19,100	0.5-0.8	2,100-6,300	0.12-0.3	0.05-0.075
ø4	4	6,300-14,300	0.5-1.0	4,700-11,100	0.5-1.0	4,700-14,300	0.5-1.0	1,500-4,700	0.16-0.3	
ø5	4	5,000-11,400	0.6-1.0	3,800-8,900	0.6-1.0	3,800-11,400	0.6-1.0	1,200-3,800	0.16-0.4	
ø6	4	4,200-9,500	0.6-1.0	3,100-7,400	0.6-1.0	3,100-9,500	0.6-1.0	1,000-3,100	0.2-0.4	
ø7	6	3,600-8,100	0.6-1.8	2,700-6,300	0.6-1.8	2,700-8,100	0.6-1.8	900-2,700	0.25-0.6	0.05-0.10
ø8	6	3,100-7,100	0.6-1.8	2,300-5,500	0.6-1.8	2,300-7,100	0.6-1.8	800-2,300	0.25-0.6	
ø9	6	2,800-6,300	0.6-1.8	2,100-4,900	0.6-1.8	2,100-6,300	0.6-1.8	700-2,100	0.3-0.6	
ø10	6	2,500-5,700	0.6-1.8	1,900-4,400	0.6-1.8	1,900-5,700	0.6-1.8	630-1,900	0.3-0.6	
ø11	6	2,300-5,200	0.6-2.0	1,700-4,000	0.6-2.0	1,700-5,200	0.6-2.0	570-1,700	0.3-0.8	0.10-0.15
ø12	6	2,100-4,700	0.6-2.0	1,500-3,700	0.6-2.0	1,500-4.700	0.6-2.0	530-1,500	0.3-0.8	

1. The recommended conditions above are for cases where a water soluble coolant is used.
2. Supply sufficient water soluble coolant to the blade.
3. When performing intermittent cutting, reduce the feed rate for the interrupted part by about 30%.
4. Use with external coolant supply is also possible, but chip evacuation may suffer.
5. For machining with oil-based coolant and oil-based MQL, use the low speed side.

■ Precautions for Use

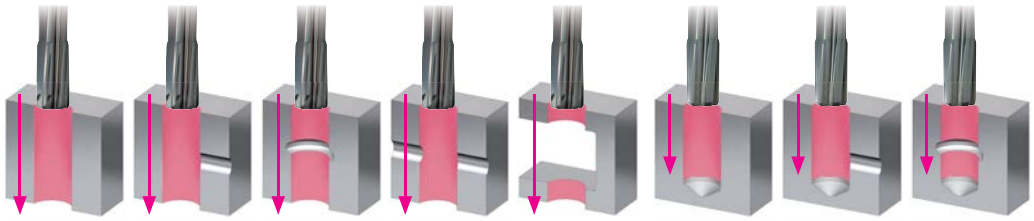
● Runout

Machining with poor runout negatively affects hole accuracy and tool life.

Mount on a high-accuracy tool holder and collet, etc., in order to minimize cutting edge runout as far as possible. (10µm or less is required.)

For the tool holder, holders with hydraulic chuck, shrink-fit, or runout adjustment mechanism are recommended.

● Applicable Hole Shapes



Through Hole | Blind Hole

*There is no bottom cutting edge, so bottom finishing is not possible.

● Coolant

Internal coolant supply is recommended.

We recommend coolant pressure of 1.5MPa or higher, for chip evacuation purposes.

Use of external coolant supply may reduce chip evacuation performance and damage machined surface quality.

● Pull-out Hole

When reaming blind holes connected to through holes, use through hole type reamers. (Not usable for blind holes)

Also check that the process does not create problems for chip evacuation performance.

Not usable for blind holes

■ Troubleshooting

Failure	Countermeasures
Enlarged hole diameter	· Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) · Decrease cutting speed. · Increase feed rate. · Reduce stock removal. · Check cutting edge for damage. · Change reamer diameter. · Increase coolant concentration.
Tapered hole	· Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) · Decrease cutting speed. · Reduce feed rate. · Review pre-reaming process. (Prepared hole deviation) · Review workpiece clamping method. · Compare hole diameters when the workpiece is clamped and unclamped. · Correct chip evacuation. (Increase coolant supply pressure) · Adjust coolant concentration.
Chatter marks on machined surface	· Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) · Decrease cutting speed. · Increase feed rate. · Review workpiece clamping method. · Change cutting edge approach angle to a made-to-order design.
Poor finished surface roughness	· Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) · Increase cutting speed. · Check cutting edge for damage. · Check whether cutting conditions are within the recommended range. · Increase coolant concentration.

Failure	Countermeasures
Return mark	· Reduce runout as much as possible. (Use holder with hydraulic chuck, shrink-fit, or runout adjustment mechanism) · Check cutting edge for damage. · Reduce stock removal. · Decrease return rate after reaming.
Irregular cutting noise	· Check cutting edge for damage. · Increase the stock removal. · Decrease the coolant concentration. · Change cutting edge approach angle to a made-to-order design.
Smaller hole diameter	· Increase cutting speed. · Reduce feed rate. · Check cutting edge for damage. · Increase the stock removal. · Decrease the coolant concentration.

■ Application Examples

Steel S45C Automotive Component		Sumitomo	Competitor's Product
Horizontal Machining Centre	Diameter (mm)	7	7
	Number of Flutes	6	3
	vc (m/min)	110	50
	f (mm/rev)	0.55	0.36
	vf (mm/min)	2,752	819
	ap (mm)	0.05	0.15
	Coolant	Wet	Wet
	Results	3x or more machining efficiency, 4x tool life achieved	
Required Precision Hole Dia.: ø7 $^{+0.020}_{0}$ (Drilled hole depth: 23mm) Surface Roughness: Ra 1.0µm			

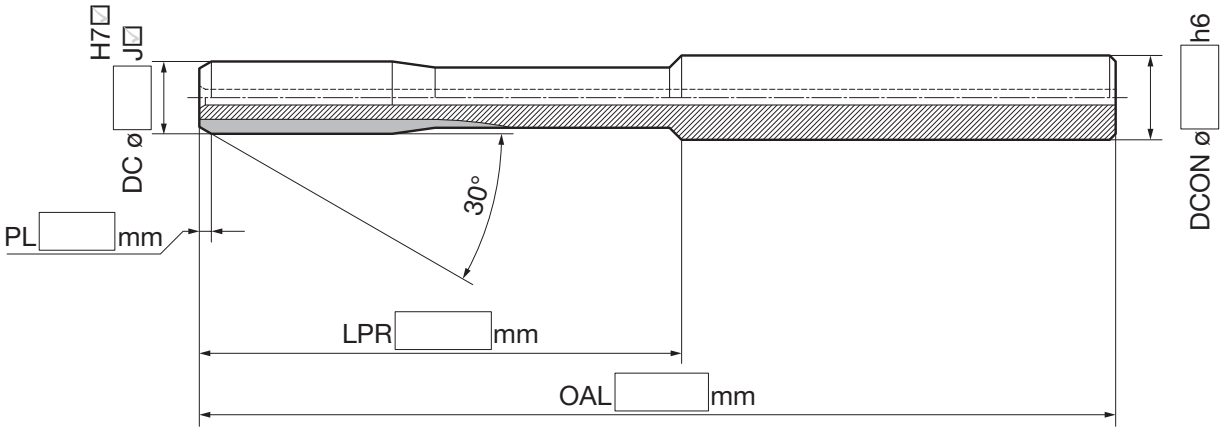
Cast Iron FCV420 Hydraulic Component		Sumitomo	Competitor's Product
Vertical Machining Centre	Diameter (mm)	11	11
	Number of Flutes	6	6
	vc (m/min)	110	15
	f (mm/rev)	0.66	0.12
	vf (mm/min)	2,101	52
	ap (mm)	0.1	0.1
	Coolant	Wet	Wet
	Results	40x or more machining efficiency, 2.3x tool life achieved Machining cycle time reduced from 17.3 seconds to 0.4 seconds	
Required Precision Hole Dia.: ø11 $^{+0.018}_{0}$ (Drilled hole depth: 15mm) Surface Roughness: Ra 1.6µm			

Steel S45C Automotive Component		Sumitomo	Competitor's Product
NC Lathe	Diameter (mm)	5.5	5.5
	Number of Flutes	4	4
	vc (m/min)	90	90
	f (mm/rev)	1.0	1.0
	vf (mm/min)	5,211	5,211
	ap (mm)	0.1	0.1
	Coolant	Wet	Wet
	Results	Tool life doubled	
Required Precision Hole Dia.: ø5.5 $^{+0.030}_{0}$ (Drilled hole depth: 35mm) Surface Roughness: Rz 6.3µm			

Steel SCM440 (45HRC) Automotive Component		Sumitomo	Competitor's Product
NC Lathe	Diameter (mm)	8	8
	Number of Flutes	6	6
	vc (m/min)	40	20
	f (mm/rev)	0.14	0.09
	vf (mm/min)	223	72
	ap (mm)	0.15	0.15
	Coolant	Wet	Wet
	Results	3x or more machining efficiency, 2.9x tool life achieved	
Required Precision Hole Dia.: ø8 $^{+0.030}_{0}$ (Drilled hole depth: 33mm) Surface Roughness: Ra 1.6µm			

*For diameters of ø12mm or larger, use the SumiReamer SR series.

SumiReamer SSR series Made-To-Order Request Sheet



■ Equipment Information

Manufacturer :

Type : ☐ MC ☐ NC Lathe ☐ Multi-tasking Machine

Tool Folder : ☐ BT ☐ HSK ☐ Other

Coolant : ☐ Water-soluble ☐ Oil-based ☐ MQL

Coolant Supply : ☐ Internal Coolant Supply ☐ External Coolant Supply

■ Workpiece Information

Part Name :

Work Material :

Work Material Hardness :

Hole type : ☐ Through Hole ☐ Blind Hole

Interrupted Cutting : ☐ Yes ☐ No

Hole Depth :

■ Workpiece Shape

■ Required Precision

Hole Dia. Tolerance :

Surface Roughness :

Circularity :

Cylindricity :

Other :

■ Current Tool

Number of Flutes :

Cutting Conditions : vc = m/min f = mm/rev ap = mm

Tool Life :

Tool Life Criteria :

After filling in the required dimensions and other information, contact our nearest sales office or distributor.

Feel free to contact us with other requests as well.

Company Name/Contact

■ Remarks

MEMO

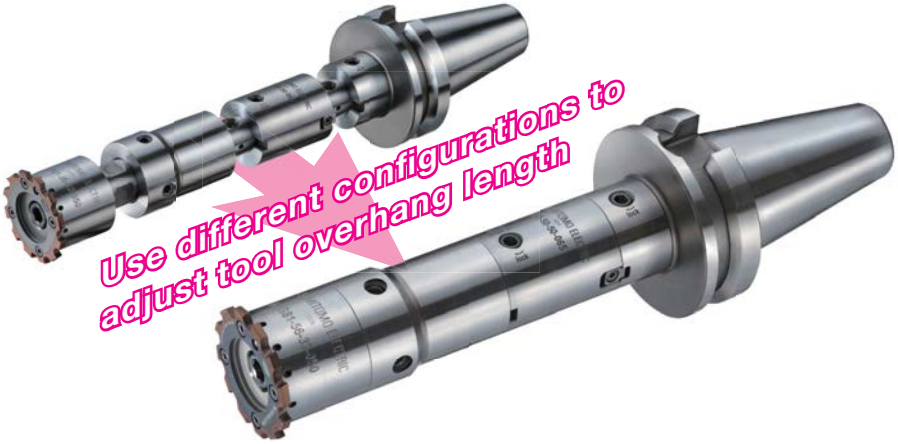
SR series

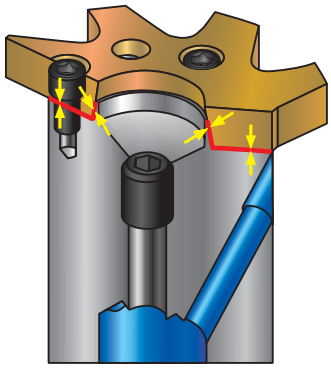
■ Features

- ● Achieving high efficiency with high speed and high feed capabilities! (vc=50 to 500m/min, f=0.4 to 1.2mm/rev)
- · Compatible with a wide range of cutting conditions, allowing management of cutting conditions and coolant supply
- · Designed with minimal cutting edge length, eliminating galling and blemishes for improved quality
- · Adoption of indexable cutting edge design improves reliability of quality and tool life, eliminating inconsistency in tool life of regrind tools
- · Cutting edge diameters from ø11.9 to ø140.6mm available

● Easy insert replacement

● Flexible tool overhang lengths possible by combining the modular extension/ arbor and shank with insert runout adjustment mechanism





A taper supports the insert on two faces (based on the HSK standard) for repeatability within 4 µm using random inserts

■ Application Examples

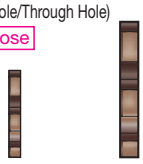
Workpiece	Cylinder barrel	Connecting rod	Sliding yoke	Front axle	Special holder with guide pads Control valve
Work Material	FCD600	Forged S55C	S45C	Forged S58C	Forged S55C
Holder Cat. No. Insert Cat. No.	**SRD19-12-115** SRG17.0H7-A01-T1212R1	**SRD36-25-170** SRG29.0H7-A01-F0512R1	**SRD19-12-115** SRG16.02Q+3-3-C01-F0512R1	**SRD29-20-240** SRL28.0H7-B01-F0512R1	Special holder with guide pads SRL14.0H7-B01-F0512R1
Max. Work Dia. (mm)	ø17.0	ø29.0	ø16.02	ø28.0	ø14.0
Hole Dia. Tolerance	H7	H7	H7	H7	H7
Surface Roughness (µm)	Rz10.0	Ra0.8	Ra3.2	Ra3.2	Ra1.6
Circularity (µm)	5	2	–	5	5
Cylindricity (µm)	5	4	–	5	5
Number of Flutes	6	8	6	8	6
vc (m/min)	148	120	150	60	100
n (min^{-1})	2,772	1,318	2,982	682	2,230
fz (mm/t)	0.20	0.15	0.10	0.075	0.10
vf (m/min)	3,326	1,582	1,789	409	1,368
ap (mm)	0.10	0.15	0.15	0.15	0.15
Wet / Dry	Wet	Wet	Wet	Wet	Wet
Tool Life, etc.	57.9m	30.52m	–	15.8m	–

■ SumiReamer SR series Configurations

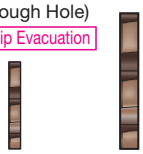
(1)

Insert
J162

● SRG type (Blind Hole/Through Hole)
General-purpose



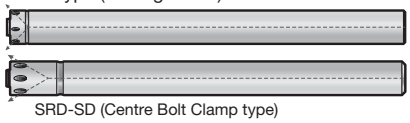
● SRL type (Through Hole)
Emphasis on Chip Evacuation



Diameter:ø11.900 to ø140.600mm

Holders
J164

● SRD type (Through Hole)



SRD-SD (Centre Bolt Clamp type)

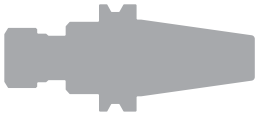
● SRB type (Blind Hole)

SRB-SD (Centre Bolt Clamp type)

Applicable insert diameter range : ø11.900 to ø35.600mm
Shank length : 100 to 274mm

Arbor

● BT/A type



Taper Size: 40 to 50

● HSK type

Taper Size: 50 to 100

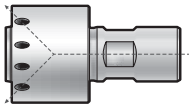
Use arbors available on the market that have runout adjustment mechanism.

(2)

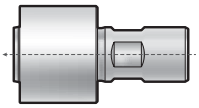
Insert Runout Adjustment Mechanism

Head
J166

● SRKG type (Through Hole)



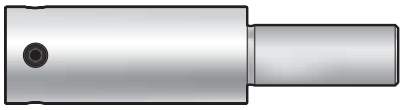
● SRKB type (Blind Hole)



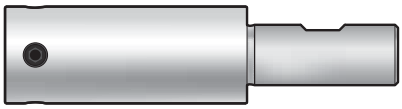
Applicable insert diameter range:
ø35.601 to ø140.600mm
Head length: 30 to 60mm

Shank
J166

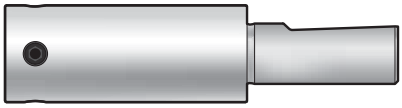
● SRA type



ZS (Cylindrical Shank) type: ZS-20/25/32/40



WD (Weldon Shank) type: WD-20/25/32/40

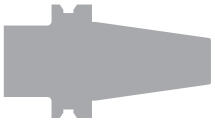


WN (Whistle Notch Shank) type: WN-20/25/32/40

Applicable insert diameter range : ø35.601 to ø140.600mm
Shank length : 80 to 160mm

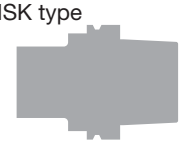
Arbor

● BT/A type



Taper Size: 40 to 50

● HSK type



Taper Size: 50 to 100

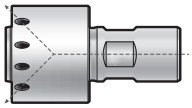
Use arbors available on the market.

(3)

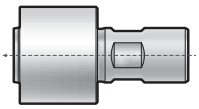
Insert Runout Adjustment Mechanism

Head
J166

● SRKG type (Through Hole)



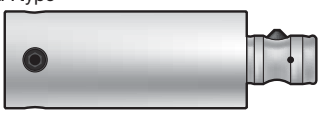
● SRKB type (Blind Hole)



Applicable insert diameter range:
ø35.601 to ø140.600mm
Head length: 30 to 60mm

Shank
J166

● SRA type



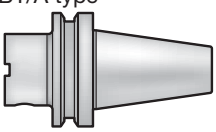
BM (Beta Module Shank) type: BM-32/40/50/63

Applicable insert diameter range : ø35.601 to ø140.600mm
Shank length : 55 to 160mm

⚠Check Sizes
When using a BM (Beta Module) type shank, choose a matching standard size.

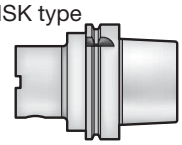
Arbor
J167

● BT/A type



Taper Size: 40 to 50

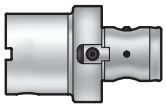
● HSK type



Taper Size: 50 to 100

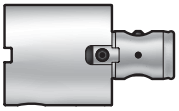
Extensions
J167

● B12 type



Shank Length: 45 to 75mm

● B13 type



Shank Length: 35 to 180mm

Multiple extensions can be connected together
When extending the overhang, it is recommended to reduce the number of extensions in consideration for rigidity.

Insert for SumiReamer SR series

● SRG type General-purpose Straight Flutes: Blind and Through Hole

Fig 1

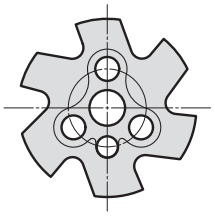
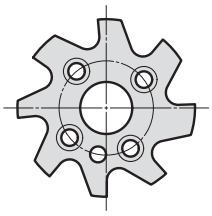
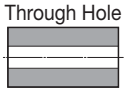
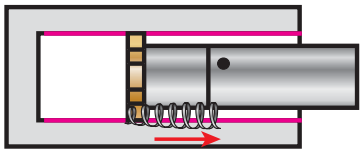


Fig 2



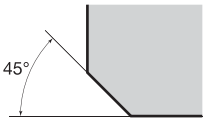


Conceptual Image of Chip Evacuation



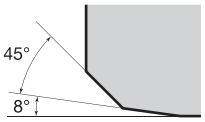
Chips Evacuated Toward Front

A01 type



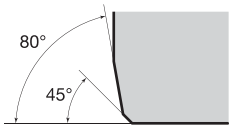
Standard type

C01 type



Surface Roughness Emphasised

S02 type



Good Straightness

Insert (SRG type)

Dimensions (mm)

Diameter DC	Diameter Tolerance	Stock	Cat. No. (A01 type) F05,T12	Stock	Cat. No. (C01 type) F05,T12	Stock	Cat. No. (S02 type) F05,T12	Work Hole Dia. Tolerance	CW	Number of Teeth	Fig
12.0	+0.017 +0.011	●	SRG 12.0H7-A01-□□□12R1	●	SRG 12.0H7-C01-□□□12R1	●	SRG 12.0H7-S02-□□□12R1	H7 +0.018 0	4.3	6	1
13.0		●	13.0H7-A01-□□□12R1	●	13.0H7-C01-□□□12R1	●	13.0H7-S02-□□□12R1		4.3	6	1
14.0		●	14.0H7-A01-□□□12R1	●	14.0H7-C01-□□□12R1	●	14.0H7-S02-□□□12R1		4.3	6	1
15.0		●	15.0H7-A01-□□□12R1	●	15.0H7-C01-□□□12R1	●	15.0H7-S02-□□□12R1		4.3	6	1
16.0		●	16.0H7-A01-□□□12R1	●	16.0H7-C01-□□□12R1	●	16.0H7-S02-□□□12R1		4.3	6	1
17.0		●	17.0H7-A01-□□□12R1	●	17.0H7-C01-□□□12R1	●	17.0H7-S02-□□□12R1		4.3	6	1
18.0		●	18.0H7-A01-□□□12R1	●	18.0H7-C01-□□□12R1	●	18.0H7-S02-□□□12R1		4.3	6	1
19.0	+0.019 +0.013	●	SRG 19.0H7-A01-□□□12R1	●	SRG 19.0H7-C01-□□□12R1	●	SRG 19.0H7-S02-□□□12R1	H7 +0.021 0	4.3	6	1
20.0		●	20.0H7-A01-□□□12R1	●	20.0H7-C01-□□□12R1	●	20.0H7-S02-□□□12R1		4.3	6	1
21.0		●	21.0H7-A01-□□□12R1	●	21.0H7-C01-□□□12R1	●	21.0H7-S02-□□□12R1		4.3	6	1
22.0		●	22.0H7-A01-□□□12R1	●	22.0H7-C01-□□□12R1	●	22.0H7-S02-□□□12R1		4.3	6	1
23.0		●	23.0H7-A01-□□□12R1	●	23.0H7-C01-□□□12R1	●	23.0H7-S02-□□□12R1		4.3	6	1
24.0		●	SRG 24.0H7-A01-□□□12R1	●	SRG 24.0H7-C01-□□□12R1	●	SRG 24.0H7-S02-□□□12R1		4.3	8	2
25.0		●	25.0H7-A01-□□□12R1	●	25.0H7-C01-□□□12R1	●	25.0H7-S02-□□□12R1		4.3	8	2
26.0		●	26.0H7-A01-□□□12R1	●	26.0H7-C01-□□□12R1	●	26.0H7-S02-□□□12R1		4.3	8	2
27.0		●	27.0H7-A01-□□□12R1	●	27.0H7-C01-□□□12R1	●	27.0H7-S02-□□□12R1		4.3	8	2
28.0		●	28.0H7-A01-□□□12R1	●	28.0H7-C01-□□□12R1	●	28.0H7-S02-□□□12R1		4.3	8	2
29.0		●	29.0H7-A01-□□□12R1	●	29.0H7-C01-□□□12R1	●	29.0H7-S02-□□□12R1		4.3	8	2
30.0		●	30.0H7-A01-□□□12R1	●	30.0H7-C01-□□□12R1	●	30.0H7-S02-□□□12R1		4.3	8	2

Ordering Method: For the catalogue number, please indicate F05 (PVD grade) or T12 (Coated Cermet) in the □□□ when ordering. (e.g. SRG12.0H7-A01-F0512R1).
(It is also possible to order uncoated cermet/DLC grades.)

* Actual reamed hole diameter is near the upper limit of H7 tolerance.

SumiReamer SR series Insert Cat. No. Identification Code

Specifying Inserts Using Work Hole Diameter Tolerance
The actual desired diameter will be near the upper limit of the median work hole tolerance, and will differ depending on diameter, tolerance range and grade. Contact us for more details.

SR (1) G (2) 18.2 (3) + 20 - 10 (4) - A01 (5) - F05 (6) 12R 1 (7)

(1) SR series
(2) G = Straight, L = Left-hand helix
(3) Work Material Hole Diameter (mm)
(4) Tolerance (μm) +/- or standard (e.g. H7)
(5) Approach Angle Code
(6) Grade Symbol
(7) Coating Code

Specifying Inserts Using Desired Diameter
By adding a "Q" after the diameter, it is possible to specify exact desired reamer dimensions. Uncoated items are available within ±2 μm, and coated items within ±3 μm.

SR (1) L (2) 18.2 (3) Q + 3 - 3 (4) - A01 (5) - F05 (6) 12R 1 (7)

(1) SR series
(2) G = Straight, L = Left-hand helix
(3) Median Desired Cutting Edge Diameter (mm)
(4) Tolerance (μm) +/-
(5) Approach Angle Code
(6) Grade Symbol
(7) Coating Code

Insert for SumiReamer SR series

● SRL type Chip Evacuation Performance Emphasised type Left-hand Helix: For Through Hole

Fig 1

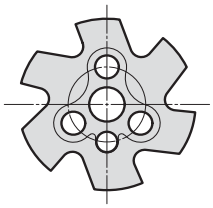
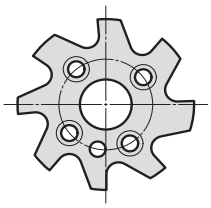
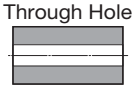


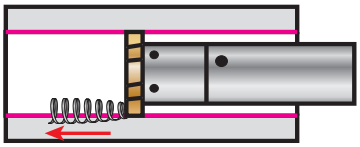
Fig 2



Through Hole

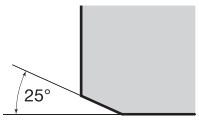


Conceptual Image of Chip Evacuation



Chips Evacuated Toward Back

B01 type



For Steel Through Hole

Insert (SRL type)

Dimensions (mm)

Diameter DC	Diameter Tolerance	Stock	Cat. No. (B01 type) F05,T12	Work Hole Dia. Tolerance	CW	Number of Teeth	Fig
12.0	+0.017 +0.011	●	SRL 12.0H7-B01- □□□12R1	H7 +0.018 0	4.3	6	1
13.0		●	13.0H7-B01- □□□12R1		4.3	6	1
14.0		●	14.0H7-B01- □□□12R1		4.3	6	1
15.0		●	15.0H7-B01- □□□12R1		4.3	6	1
16.0		●	16.0H7-B01- □□□12R1		4.3	6	1
17.0		●	17.0H7-B01- □□□12R1		4.3	6	1
18.0		●	18.0H7-B01- □□□12R1		4.3	6	1
19.0	+0.019 +0.013	●	SRL 19.0H7-B01- □□□12R1	H7 +0.021 0	4.3	6	1
20.0		●	20.0H7-B01- □□□12R1		4.3	6	1
21.0		●	21.0H7-B01- □□□12R1		4.3	6	1
22.0		●	22.0H7-B01- □□□12R1		4.3	6	1
23.0		●	23.0H7-B01- □□□12R1		4.3	6	1
24.0		●	SRL 24.0H7-B01- □□□12R1		4.3	8	2
25.0		●	25.0H7-B01- □□□12R1		4.3	8	2
26.0		●	26.0H7-B01- □□□12R1		4.3	8	2
27.0		●	27.0H7-B01- □□□12R1		4.3	8	2
28.0		●	28.0H7-B01- □□□12R1		4.3	8	2
29.0		●	29.0H7-B01- □□□12R1		4.3	8	2
30.0		●	30.0H7-B01- □□□12R1		4.3	8	2

● Made-to-order items

Dimensions (mm)

Diameter DC	CW	Number of Teeth
ø11.900to ø15.600	4.3	6
ø15.601to ø18.600	4.3	6
ø18.601to ø23.600	4.3	6
ø23.601to ø28.600	4.3	8
ø28.601to ø35.600	4.3	8
ø35.601to ø43.600	4.3	8
ø43.601to ø51.600	4.3	10
ø51.601to ø60.600	4.3	10
ø60.601to ø80.600	4.3	12
ø80.601to ø100.600	4.3	12
ø100.601to ø120.600	5.3	12
ø120.601to ø140.600	5.3	12

SRG type (Special) and SRL type (Special) are made-to-order items.
When ordering, refer to "SR series Insert Cat. No. Identification Code" on page J162.
* Cermet grades (T1200A and T1212R1) are only available up to ø100.600mm.

Ordering Method: For the catalogue number, please indicate F05 (PVD grade) or T12 (Coated Cermet) in the □□□ when ordering. (e.g. SRG12.0H7-A01-F0512R1).
(It is also possible to order uncoated cermet/DLC grades.)

*Actual reamed hole diameter is near the upper limit of H7 tolerance.

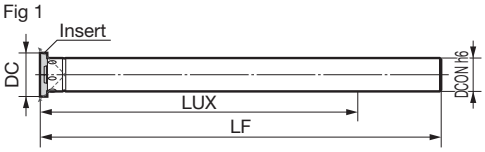
Recommended Cutting Conditions

ISO	Work Material	Insert	Grade	Grade Composition	Depth of Cut ap (mm/radius) Below ø20	ø20 to ø35	ø35 and above	Cutting Speed vc (m/min)	Feed Rate fz (mm/t)
P	Carbon Steel	SRG type	F0512R1	Micro-grained Carbide + PVD	0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	80 to 220	0.10 to 0.25
		SRL type			0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	100 to 220	0.15 to 0.35
		SRG type	T1200A	Cermet	0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	120 to 250	0.10 to 0.25
		SRL type			0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	120 to 250	0.15 to 0.35
	Alloy Steel	SRG type	F0512R1	Micro-grained Carbide + PVD	0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	60 to 180	0.06 to 0.20
		SRL type			0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	60 to 180	0.10 to 0.22
		SRG type	T1200A	Cermet	0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	70 to 200	0.08 to 0.20
		SRL type			0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	70 to 200	0.12 to 0.25
	Die Steel	SRG type	F0512R1	Micro-grained Carbide + PVD	0.05 to 0.10	0.08 to 0.15	0.10 to 0.20	15 to 60	0.06 to 0.20
	Tool Steels	SRG type	F0512R1	Micro-grained Carbide + PVD	0.05 to 0.10	0.08 to 0.15	0.10 to 0.20	15 to 30	0.04 to 0.15
M	Stainless Steel	SRG type	F0512R1	Micro-grained Carbide + PVD	0.05 to 0.10	0.08 to 0.15	0.08 to 0.20	15 to 60	0.06 to 0.20
K	Cast Iron	SRG type	F0512R1	Micro-grained Carbide + PVD	0.05 to 0.18	0.08 to 0.20	0.10 to 0.25	80 to 250	0.10 to 0.30
	Ductile Cast Iron	SRG type	T1212R1	Coated Cermet	0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	80 to 250	0.10 to 0.30
N	Non-Ferrous Alloys	SRG type	F0510C	Micro-grained Carbide + DLC	0.05 to 0.12	0.08 to 0.15	0.10 to 0.25	250 to 500	0.10 to 0.30

*For fitting tolerances, refer to Chapter N References.

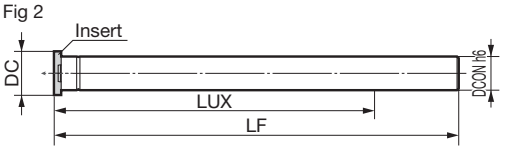
● SRD type (Through Hole)

Fig 1



● SRB type (Blind Hole)

Fig 2



Steel Shank Holder (ø11.900 to 35.600mm)

Dimensions (mm) Parts

Diameter DC Range		Holder Cat. No. SRD Stock	SRD Cat. No.	SRD Fig	SRB Stock	SRB Cat. No.	SRB Fig	Shank Dia. DCON	Shoulder Length LF	Neck Length LUX	Group No.	N·m
Short	ø11.900 to ø15.600	●	SRD 16-10-100	1	●	SRB 16-10-100	2	10	100	60	(1)	0.9
	ø15.601 to ø18.600	●	19-12-115	1	●	19-12-115	2	12	115	70	(1)	0.9
	ø18.601 to ø23.600	●	24-16-128	1	●	24-16-128	2	16	128	80	(2)	1.5
	ø23.601 to ø28.600	●	29-20-145	1	●	29-20-145	2	20	145	95	(2)	1.5
	ø28.601 to ø35.600	●	36-25-170	1	●	36-25-170	2	25	170	110	(2)	1.5
Long	ø11.900 to ø15.600		SRD 16-10-160	1		SRB 16-10-160	2	10	160	120	(1)	0.9
	ø15.601 to ø18.600		19-12-185	1		19-12-185	2	12	185	140	(1)	0.9
	ø18.601 to ø23.600		24-16-208	1		24-16-208	2	16	208	160	(2)	1.5
	ø23.601 to ø28.600		29-20-240	1		29-20-240	2	20	240	190	(2)	1.5
	ø28.601 to ø35.600		36-25-274	1		36-25-274	2	25	274	214	(2)	1.5

*Refer to the table at the bottom of J165 for the catalogue numbers of cap screws and wrenches applicable for each product.

Carbide Shank Holder (ø11.900 to 35.600mm)

Dimensions (mm) Parts

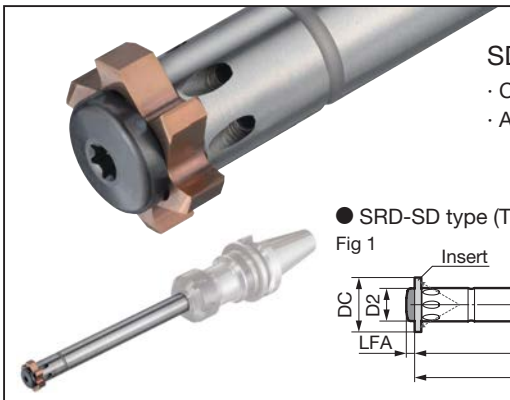
Diameter DC Range		Holder Cat. No. SRD Stock	SRD Cat. No.	SRD Fig	SRB Stock	SRB Cat. No.	SRB Fig	Shank Dia. DCON	Shoulder Length LF	Neck Length LUX	Group No.	N·m
Long	ø11.900 to ø15.600		SRD 16-10-160HM	1		SRB 16-10-160HM	2	10	160	120	(1)	0.9
	ø15.601 to ø18.600		19-12-185HM	1		19-12-185HM	2	12	185	140	(1)	0.9
	ø18.601 to ø23.600		24-16-208HM	1		24-16-208HM	2	16	208	160	(2)	1.5
	ø23.601 to ø28.600		29-20-240HM	1		29-20-240HM	2	20	240	190	(2)	1.5
	ø28.601 to ø35.600		36-25-274HM	1		36-25-274HM	2	25	274	214	(2)	1.5

*Refer to the table at the bottom of J165 for the catalogue numbers of cap screws and wrenches applicable for each product.

N·m Recommended Tightening Torque (N·m)

*For fitting tolerances, refer to Chapter N References.

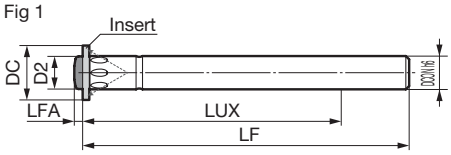
Precautions for Use J169



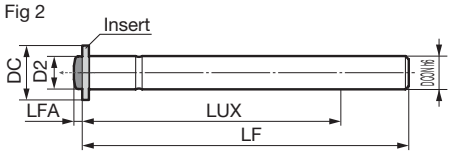
SD type (Centre Bolt Clamp type)

· Can be clamped using one centre bolt to improve work efficiency
· Applicable to high-torque (high-load) reaming

● SRD-SD type (Through Hole)
Fig 1



● SRB-SD type (Blind Hole)
Fig 2



Steel Shank Holder SRD-SD type /SRB-SD type (Centre Bolt Clamp type)

Dimensions (mm) Parts

Diameter DC Range		Holder Cat. No. SRD type (Through Hole) Stock	Cat. No.	Fig	SRB type (Blind Hole) Stock	Cat. No.	Fig	Shank Dia. DCON	Shoulder Length LF	Neck Length LUX	Bolt D2	Bolt LFA	Group No. SRD	Group No. SRB	N·m
Short	ø11.900 to ø15.600	●	SRD 16-10-100SD	1	●	SRB 16-10-100SD	2	10	100	60	9.8	2.5	(3)	(3)	4.0
	ø15.601 to ø18.600	●	19-12-115SD	1	●	19-12-115SD	2	12	115	70	11.8	3.0	(4)	(7)	6.0
	ø18.601 to ø23.600	●	24-16-128SD	1	●	24-16-128SD	2	16	128	80	15.8	4.0	(5)	(8)	16.0
	ø23.601 to ø28.600	●	29-20-145SD	1	●	29-20-145SD	2	20	145	95	15.8	4.0	(5)	(8)	16.0
	ø28.601 to ø35.600	●	36-25-170SD	1	●	36-25-170SD	2	25	170	110	24.5	4.0	(6)	(9)	18.0
Long	ø11.900 to ø15.600	●	SRD 16-10-160SD	1	●	SRB 16-10-160SD	2	10	160	120	9.8	2.5	(3)	(3)	4.0
	ø15.601 to ø18.600	●	19-12-185SD	1	●	19-12-185SD	2	12	185	140	11.8	3.0	(4)	(7)	6.0
	ø18.601 to ø23.600	●	24-16-208SD	1	●	24-16-208SD	2	16	208	160	15.8	4.0	(5)	(8)	16.0
	ø23.601 to ø28.600	●	29-20-240SD	1	●	29-20-240SD	2	20	240	190	15.8	4.0	(5)	(8)	16.0
	ø28.601 to ø35.600	●	36-25-274SD	1	●	36-25-274SD	2	25	274	214	24.5	4.0	(6)	(9)	18.0

*Refer to the table at the bottom of J165 for the catalogue numbers of cap screws and wrenches applicable for each product.

Carbide Shank Holder SRD-SD type /SRB-SD type (Centre Bolt Clamp type)

Dimensions (mm) Parts

Diameter DC Range		Holder Cat. No. SRD type (Through Hole) Stock	Cat. No.	Fig	SRB type (Blind Hole) Stock	Cat. No.	Fig	Shank Dia. DCON	Shoulder Length LF	Neck Length LUX	Bolt D2	Bolt LFA	Group No. SRD	Group No. SRB	N·m
Long	ø11.900 to ø15.600		SRD 16-10-160HMSD	1		SRB 16-10-160HMSD	2	10	160	120	9.8	2.5	(3)	(3)	4.0
	ø15.601 to ø18.600		19-12-185HMSD	1		19-12-185HMSD	2	12	185	140	11.8	3.0	(4)	(7)	6.0
	ø18.601 to ø23.600		24-16-208HMSD	1		24-16-208HMSD	2	16	208	160	15.8	4.0	(5)	(8)	16.0
	ø23.601 to ø28.600		29-20-240HMSD	1		29-20-240HMSD	2	20	240	190	15.8	4.0	(5)	(8)	16.0
	ø28.601 to ø35.600		36-25-274HMSD	1		36-25-274HMSD	2	25	274	214	24.5	4.0	(6)	(9)	18.0

*Refer to the table at the bottom of J165 for the catalogue numbers of cap screws and wrenches applicable for each product.

Fig 1

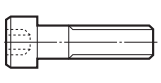


Fig 2

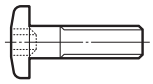


Fig 3

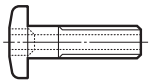


Fig 4

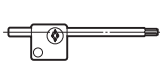
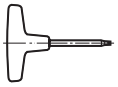


Fig 5



Torque Wrench

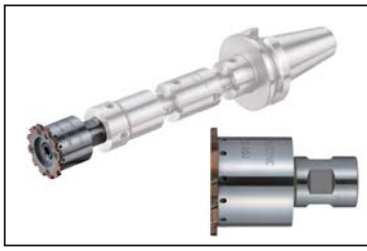
Wrench Cat. No.	Applicable Holder Cat. No.	Torx	Torque Setting
G00-40-11	SR□ 16 / SR□ 19	T 6	0.9N·m
G00-40-12	SR□ 24 - SR□ 61	T 8	1.5N·m
G00-40-13	SR□ 81 / SR□ 101	T 15	3.5N·m

All in stock.

D,B,KG,A

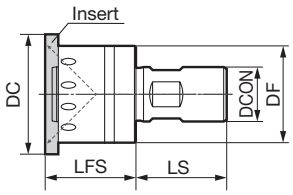
Cap Screws and Wrench

Group No.	Cat. No. Cap Screw	Fig	Wrench	Fig	Torx	N·m
(1)	C00-90-00	1	G00-02-01	4	T 6	0.9
(2)	C00-90-01	1	G00-02-02	4	T 8	1.5
(3)	C00-90-22	2	G00-20-27	5	T15	4.0
(4)	C00-90-23	2	G00-20-28	5	T20	6.0
(5)	C00-90-24	2	G00-20-29	5	T30	16.0
(6)	C00-90-25	2	G00-20-29	5	T30	18.0
(7)	C00-90-23B	3	G00-20-28	5	T20	6.0
(8)	C00-90-24B	3	G00-20-29	5	T30	16.0
(9)	C00-90-25B	3	G00-20-29	5	T30	18.0



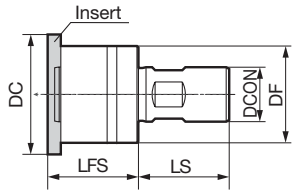
● SRKG type (Through Hole)

Fig 1



● SRKB type (Blind Hole)

Fig 2



Head (ø35.601 to 140.6mm)

Dimensions (mm) Parts

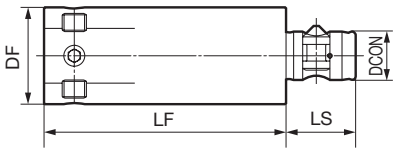
Diameter DC Range	Head Cat. No.						Diameter	Shank Dia.	Length	Shank	For mounting insert		For centre locking			
	Stock	SRKG	Fig	Stock	SRKB	Fig	DF	DCON	LFS	LS	Group No.	N·m	Group No. SRKG	N·m	Group No. SRKB	N·m
ø35.601 to ø43.600		SRKG 44-32-18-030	1		SRKB 44-32-18-030	2	32	18	30	30	(1)	1.5	(3)	35.0	(8)	35.0
ø43.601 to ø51.600		52-39-20-035	1		52-39-20-035	2	39	20	35	30	(1)	1.5	(4)	35.0	(9)	35.0
ø51.601 to ø60.600		61-46-25-040	1		61-46-25-040	2	46	25	40	35	(1)	1.5	(5)	55.0	(10)	55.0
ø60.601 to ø80.600		81-56-32-050	1		81-56-32-050	2	56	32	50	40	(2)	3.5	(6)	85.0	(11)	85.0
ø80.601 to ø100.600		101-76-40-060	1		101-76-40-060	2	76	40	60	50	(2)	3.5	(7)	120.0	(12)	120.0
ø100.601 to ø120.600		SRKG 121-76-40-060	1		SRKB 121-76-40-060	2	76	40	60	50	(2)	3.5	(7)	120.0	(12)	120.0
ø120.601 to ø140.600		141-76-40-060	1		141-76-40-060	2	76	40	60	50	(2)	3.5	(7)	120.0	(12)	120.0

*Refer to the table at the bottom of J167 for the catalogue numbers of cap screws and wrenches applicable for each product.

● SRA type

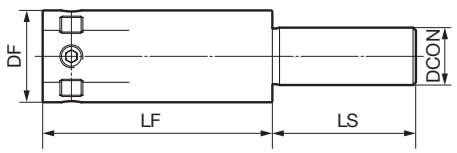
BM (Beta Module Shank) type

Fig 1



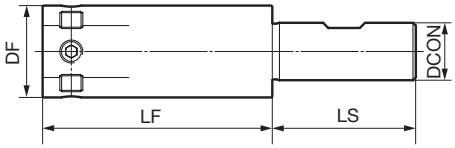
ZS (Cylindrical Shank) type

Fig 2



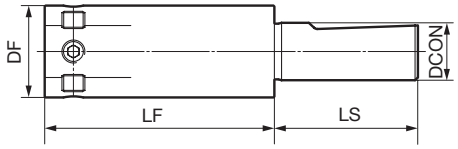
WD (Weldon Shank) type

Fig 3



WN (Whistle Notch Shank) type

Fig 4



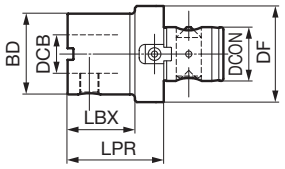
Shank (with Insert Runout Adjustment Mechanism)

Dimensions (mm) Parts

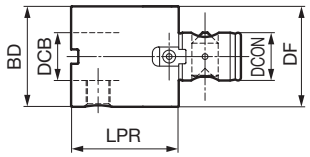
Shank type	Diameter DC Range	Shank Cat. No.		Diameter	Shank Dia.	Length	Shank	Fig	Cap Screw	Wrench	Clamp	Bolt
		Stock	SRA	DF	DCON	LF	LS					
BM	ø35.601 to ø43.600		SRA 44-32-BM32-055	32	BM-32	55	8.5	1	C00-90-08	G00-02-05	Z00-32-21	Z00-32-23
			44-32-BM32-080	32	BM-32	80	8.5	1				
	ø43.601 to ø51.600		SRA 52-39-BM40-060	39	BM-40	60	26.0	1	C00-90-10	G00-02-06	Z00-40-21	Z00-40-23
			52-39-BM40-100	39	BM-40	100	26.0	1				
	ø51.601 to ø60.600		SRA 61-46-BM50-070	46	BM-50	70	31.0	1	C00-90-10	G00-02-06	Z00-40-21	Z00-40-23
			61-46-BM50-120	46	BM-50	120	31.0	1				
	ø60.601 to ø80.600		SRA 81-56-BM50-080	56	BM-50	80	31.0	1	C00-90-12	G00-02-07	Z00-50-21	Z00-50-23
			81-56-BM50-140	56	BM-50	140	31.0	1				
	ø80.601 to ø140.600		SRA 101-76-BM63-100	76	BM-63	100	38.0	1	C00-90-16	G00-02-08	Z00-63-21	Z00-63-23
			101-76-BM63-160	76	BM-63	160	38.0	1				
ZS	ø35.601 to ø43.600		SRA 44-32-ZS20-080	32	ZS-20	80	50.0	2	C00-90-08	G00-02-05	—	—
	ø43.601 to ø51.600		SRA 52-39-ZS25-100	39	ZS-25	100	56.0	2	C00-90-10	G00-02-06	—	—
	ø51.601 to ø60.600		SRA 61-46-ZS32-120	46	ZS-32	120	60.0	2			—	—
	ø60.601 to ø80.600		SRA 81-56-ZS40-080	56	ZS-40	80	70.0	2	C00-90-12	G00-02-07	—	—
			81-56-ZS40-140	56	ZS-40	140	70.0	2				
	ø80.601 to ø140.600		SRA 101-76-ZS40-100	76	ZS-40	100	70.0	2	C00-90-16	G00-02-08	—	—
			101-76-ZS40-160	76	ZS-40	160	70.0	2				
WD	ø35.601 to ø43.600		SRA 44-32-WD20-080	32	WD-20	80	50.0	3	C00-90-08	G00-02-05	—	—
	ø43.601 to ø51.600		SRA 52-39-WD25-100	39	WD-25	100	56.0	3	C00-90-10	G00-02-06	—	—
	ø51.601 to ø60.600		SRA 61-46-WD32-120	46	WD-32	120	60.0	3	C00-90-10	G00-02-06	—	—
	ø60.601 to ø80.600		SRA 81-56-WD40-080	56	WD-40	80	70.0	3	C00-90-12	G00-02-07	—	—
			81-56-WD40-140	56	WD-40	140	70.0	3				
	ø80.601 to ø140.600		SRA 101-76-WD40-100	76	WD-40	100	70.0	3	C00-90-16	G00-02-08	—	—
			101-76-WD40-160	76	WD-40	160	70.0	3				
WN	ø35.601 to ø43.600		SRA 44-32-WN20-080	32	WN-20	80	50.0	4	C00-90-08	G00-02-05	—	—
	ø43.601 to ø51.600		SRA 52-39-WN25-100	39	WN-25	100	56.0	4	C00-90-10	G00-02-06	—	—
	ø51.601 to ø60.600		SRA 61-46-WN32-120	46	WN-32	120	60.0	4	C00-90-10	G00-02-06	—	—
	ø60.601 to ø80.600		SRA 81-56-WN40-080	56	WN-40	80	70.0	4	C00-90-12	G00-02-07	—	—
			81-56-WN40-140	56	WN-40	140	70.0	4				
	ø80.601 to ø140.600		SRA 101-76-WN40-100	76	WN-40	100	70.0	4	C00-90-16	G00-02-08	—	—
			101-76-WN40-160	76	WN-40	160	70.0	4				

N·m Recommended Tightening Torque (N·m)

● B12 type
Fig 1



● B13 type
Fig 2



Extension B12 type

Dimensions (mm)

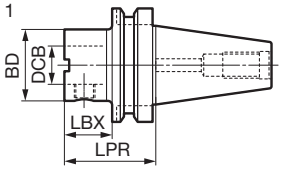
Cat. No.	Stock	Diameter BD	Drill Dia. DCB	Diameter DF	Shank Dia. DCON	Overhang Length LPR	Body LBX	Weight (kg)	Fig
B12-40-32-045		32	BM-32	42	BM-40	45	30	0.3	1
B12-50-40-050		42	BM-40	50	BM-50	50	35	0.5	1
B12-63-32-050		32	BM-32	63	BM-63	50	30	0.9	1
40-055		42	BM-40	63	BM-63	55	35	1.1	1
B12-80-40-060		42	BM-40	80	BM-80	60	35	2.2	1
63-060		63	BM-63	80	BM-80	60	35	2.4	1
B12-100-40-060		42	BM-40	100	BM-100	60	35	3.1	1
63-060		63	BM-63	100	BM-100	60	35	3.3	1
80-075		80	BM-80	100	BM-100	75	50	3.5	1

B13 type

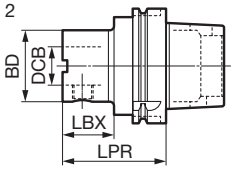
Dimensions (mm)

Cat. No.	Stock	Diameter BD	Drill Dia. DCB	Diameter DF	Shank Dia. DCON	Overhang Length LPR	Body LBX	Weight (kg)	Fig
B13-32-32-035		32	BM-32	32	BM-32	35	—	0.2	2
070		32	BM-32	32	BM-32	70	—	0.4	2
B13-40-40-045		42	BM-40	42	BM-40	45	—	0.4	2
070		42	BM-40	42	BM-40	70	—	0.7	2
B13-50-50-065		50	BM-50	50	BM-50	65	—	1.0	2
100		50	BM-50	50	BM-50	100	—	1.5	2
B13-63-63-060		63	BM-63	63	BM-63	60	—	1.3	2
125		63	BM-63	63	BM-63	100	—	2.9	2
B13-80-80-080		80	BM-80	80	BM-80	80	—	2.9	2
160		80	BM-80	80	BM-80	160	—	4.9	2
B13-100-100-080		100	BM-100	100	BM-100	80	—	4.9	2
180		100	BM-100	100	BM-100	180	—	10.9	2

● BT/A type
Fig 1



● HSK type
Fig 2



Arbor (BETA Module)

BT/A type

Dimensions (mm)

Cat. No.	Stock	Taper Size	Diameter BD	Drill Dia. DCB	Overhang Length LPR	Body LBX	Weight (kg)	Fig
BT10-40A-32-060		40	32	BM-32	60	33	0.9	1
40-028		40	42	BM-40	28	1	0.9	1
40-060		40	42	BM-40	60	33	1.2	1
50-060		40	50	BM-50	60	33	1.3	1
63-055		40	63	BM-63	55	28	1.4	1
BT10-50A-32-070		50	32	BM-32	70	32	3.7	1
40-070		50	42	BM-40	70	32	3.9	1
50-070		50	50	BM-50	70	32	4.1	1
63-080		50	63	BM-63	80	42	4.3	1
80-100		50	80	BM-80	100	62	5.5	1
100-110		50	100	BM-100	110	72	7.0	1

HSK type (Coolant tube sold separately)

Dimensions (mm)

Cat. No.	Stock	Taper Size	Diameter BD	Drill Dia. DCB	Overhang Length LPR	Body LBX	Weight (kg)	Fig
BH10-50A-40-065		50	42	BM-40	65	39	0.7	2
BH10-63A-32-060		63	32	BM-32	60	34	1.0	2
40-065		63	42	BM-40	65	23	1.1	2
50-070		63	50	BM-50	70	44	1.5	2
63-080		63	63	BM-63	80	38	1.5	2
BH10-100A-40-080		100	42	BM-40	80	35	2.3	2
50-080		100	50	BM-50	80	35	2.5	2
63-080		100	63	BM-63	80	35	2.8	2
80-090		100	80	BM-80	90	45	3.8	2
100-100		100	100	BM-100	100	55	4.0	2

Parts

Fig 1

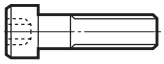


Fig 2

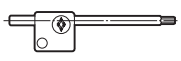
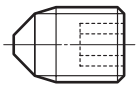


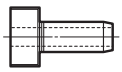
Fig 3

Group No.	Cat. No. Cap Screw	Fig	Cat. No. Wrench	Fig	Torx/ Hex	N·m
(1)	C00-90-02	1	G00-20-02	2	T 8	1.5
(2)	C00-90-04	1	G00-20-03	2	T15	3.5
(3)	C00-26-23G	1	G00-02-07	3	6	35.0
(4)	C00-26-38G	1	G00-02-07	3	6	35.0
(5)	C00-24-26G	1	G00-02-08	3	8	55.0
(6)	C00-26-37G	1	G00-02-09	3	10	85.0
(7)	C00-24-31G	1	G00-02-16	3	14	120.0
(8)	C00-26-23B	1	G00-02-07	3	6	35.0
(9)	C00-26-38B	1	G00-02-07	3	6	35.0
(10)	C00-24-26B	1	G00-02-08	3	8	55.0
(11)	C00-26-37B	1	G00-02-09	3	10	85.0
(12)	C00-24-31B	1	G00-20-16	3	14	120.0



Clamp Screw

Size	Cat. No.
25	Z00-25-24
32	Z00-32-24
40	Z00-40-24
63	Z00-63-24
80	Z00-80-24
100	Z00-100-24



Coolant Tubes

Taper Size	Cat. No.
50	H00-50-01
63	H00-63-01
100	H00-100-01

For the HSK type arbor.

N·m Recommended Tightening Torque (N·m)

■ SR series Usage Instructions (Adjusting Runout)

The runout at the cutting edge of a reamer should be zero (0.005mm or less recommended) to obtain optimum reaming precision. To correct runout in the holder or the machine's spindle, use of holders with a runout adjustment mechanism, hydro chucks and shrink-fitting is recommended. Various methods can be used to measure runout on a SumiReamer SR series reamer. With good runout repeatability, it is recommended that inserts be replaced without removing the shank holder from the spindle.

● Runout Adjustment

A. **Simple measurement method (measure holder short taper)**
The short taper on the holder where the insert is mounted provides the easiest and most accurate measurement before mounting the insert.

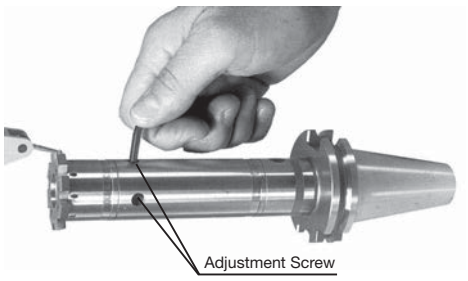
B. **Precise method for measuring runout (measure insert arc-shaped land)**
Measuring the land immediately after the outer diameter of the insert eliminates all mounting error.
This allows the most accurate runout measurement.

C. **Simple measurement method (measure holder outer diameter)**
The high-precision machined outer diameter of the shank holder provides a good estimate of the runout measurement.

*A has the greatest runout accuracy, followed by B and then C.

● Runout adjustment using shank with runout adjustment mechanism (>ø35.6mm)

(1) Tighten the centre set screw to torque value A in the table below, then attach the insert and measure the runout of the cutting edge.
(2) Verify the cutting edge where runout peaks and adjust with the adjustment screw.
(3) Repeat this adjustment for each tooth as necessary.
(4) Remove the adjusted insert, tighten the centre set screw to torque value B in the table below and then re-attach the insert.

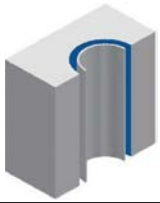
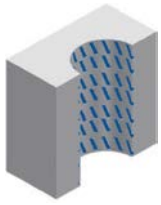
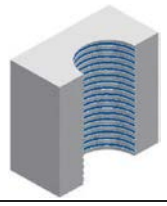


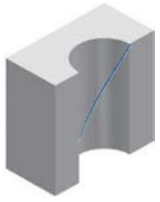
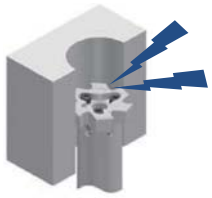
Recommended Tightening Torque for Centre Set Screw (N·m)

Head Size	Cap Screw	Size	A	B
SRK□44	C00-26-23G/B	M8×60	25	32
SRK□52	C00-26-38G/B	M8×70	25	32
SRK□61	C00-24-26G/B	M10×80	40	55
SRK□81	C00-26-37G/B	M12×100	65	85
SRK□101	C00-24-31G/B	M16×100	95	120

G, B

■ Troubleshooting

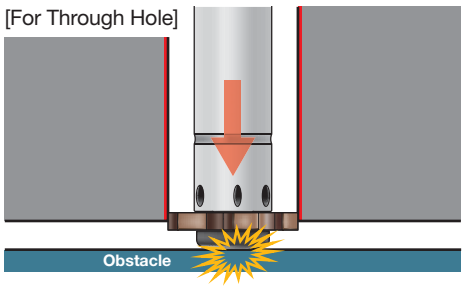
Failure	Countermeasures
Enlarged hole diameter 	· Reduce runout as much as possible. (use a holder with a diameter correction mechanism) · Decrease cutting speed. · Increase the feed rate. · Increase coolant concentration. · Reduce stock removal. · Check cutting edge for damage. (whether there are built-up edges) · Change insert diameter.
Tapered hole	· Reduce runout as much as possible. (use a holder with a diameter correction mechanism) · Decrease cutting speed. · Decrease the feed rate. · Adjust coolant concentration. · Review pre-machining process. · Review workpiece clamping method. · Compare the hole diameters when the workpiece is clamped and when it is unclamped. · Check and correct the direction of chip evacuation.
Chatter marks on machined surface 	· Reduce runout as much as possible. (use a holder with a diameter correction mechanism) · Change the approach angle of the insert cutting edge. · Review workpiece clamping method. · Decrease cutting speed. · Increase the feed rate.
Poor finished surface roughness 	· Check cutting edge for damage. · Reduce runout as much as possible. (use a holder with a diameter correction mechanism) · Check whether cutting conditions are within the recommended range. · Change to internal coolant supply. · Increase coolant concentration.

Failure	Countermeasures
Return mark 	· Reduce runout as much as possible. (use a holder with a diameter correction mechanism) · Check cutting edge for damage. (whether there are built-up edges) · Reduce stock removal. · Change to an insert with a sharper cutting edge shape. · Decrease the return (lifting) feed.
Irregular cutting noise 	· Decrease the coolant concentration. · Increase the stock removal. · Check cutting edge for damage. · Change the approach angle of the insert cutting edge.
Smaller hole diameter	· Replace the insert. · Decrease the coolant concentration. · Increase the stock removal. · Increase cutting speed. · Decrease the feed rate.

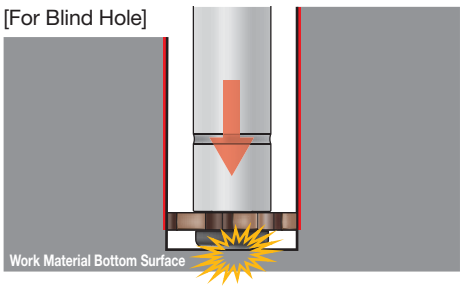
● Precautions for SD series (Centre Bolt Clamp type)

This product can be used for both through-hole and stop-hole reaming. However, the head of the centre bolt protrudes from the end of the body, so ensure clearance by referring to the protrusion of the centre bolt (LFA) shown in the dimension table.

[For Through Hole]



[For Blind Hole]



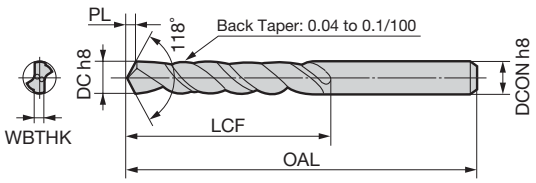
SD series

Cast Iron | Ductile Cast Iron | Aluminum Alloy

Uncoated Carbide | 6to15 D

*Refer to N36 for the tolerance of h8

Fig 1



Cat. No.	Stocked Size	Dia. (Shank Dia.) DC(DCON)	Flute Length LCF	Overall Length OAL	Tip PL	Web Thickness WBTHK	Fig
SD 080 to 090		**0.80 to 0.89**	12	30	0.3	0.2	1
SD 091 to 140		**0.90 to 1.39**	16	30	0.4	0.2 to 0.3	1
SD 141 to 190		**1.40 to 1.90**	20	35	0.5	0.4	1
SD 191 to 240		**1.91 to 2.40**	23	41	0.6	0.5	1
SD 241 to 300		**2.41 to 3.00**	26	46	0.8	0.6	1
SD 301 to 350		**3.01 to 3.50**	29	51	1.0	0.7	1
SD 351 to 400		**3.51 to 4.00**	31	56	1.1	0.8	1
SD 401 to 450		**4.01 to 4.50**	35	61	1.4	0.9	1
SD 451 to 550		**4.51 to 5.50**	40	67	1.5	1.0	1
SD 551 to 600		**5.51 to 6.00**	42	72	1.7	1.1	1
SD 601 to 650		**6.01 to 6.50**	45	77	1.9	1.2	1
SD 651 to 700		**6.51 to 7.00**	48	82	2.0	1.3	1
SD 701 to 750		**7.01 to 7.50**	48	82	2.2	1.4	1
SD 751 to 800		**7.51 to 8.00**	52	87	2.3	1.5	1

Ordering numbers should be handled according to this example: ø4.6mm drill → SD460.
Grade: H1

Recommended Cutting Conditions for SD series

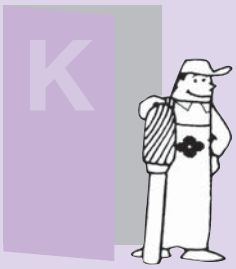
(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	Die Steel (About 250HB)	Cast Iron	Non-Ferrous Alloy
ø5.0	n	500	1,900	3,200
	vc	5 - **8** - 10	10 - **30** - 40	20 - **50** - 80
	f	0.03 - **0.04** - 0.05	0.1 - **0.15** - 0.2	0.1 - **0.15** - 0.2
ø13.0	n	370	1,000	2,000
	vc	10 - **15** - 20	20 - **40** - 60	30 - **80** - 100
	f	0.05 - **0.06** - 0.07	0.1 - **0.15** - 0.2	0.1 - **0.15** - 0.2

Min. - **Optimum** - Max.

Carbide Materials
Brazed Tools
K1 to K11

K



Carbide Material Features and Applications K2
Plate Blanks K4
Rod Blanks K5
Special Rod Blanks K6
JIS type Inserts for Carbide Tool Holders K8
JIS type Carbide Tool Holders K9

Stock Markings and Symbols

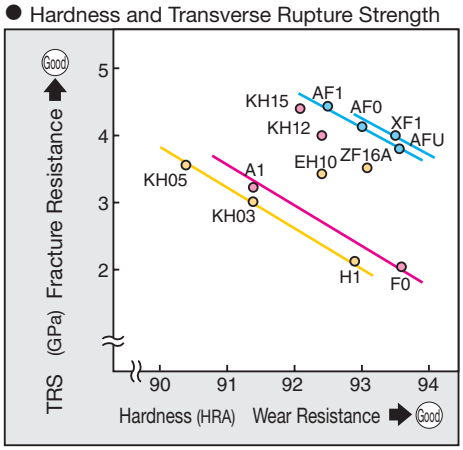
● ● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
– mark: Not available

Carbide Material Features and Applications

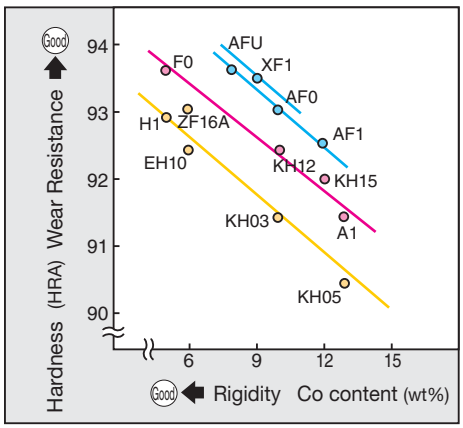
- Stringent selection of high purity and high quality raw materials
- Consistent quality and shorter delivery with the latest production facilities and techniques
- Fully equipped with the latest quality assurance system
- Constant R&D to develop the latest grades

■ Grade Map

● Hardness and Transverse Rupture Strength



● Co Content vs Hardness



■ Grade Properties and Features

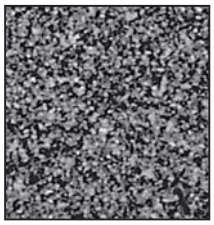
Classification	Grade	Properties					Features	Applications
		Grain Size *1 (μm)	Co Content (wt%)	Transverse Rupture Strength *2 (GPa)	Hardness (HRA)	Hardness HV (GPa)		
Ultra-fine Grained Carbide	**XF1**	0.2	9.0	4.0	93.5	20.4	Ultra-fine grained carbide with the world's finest grains	Microdrills, Very Small Diameter Drills
	AF1	0.5	12.0	4.4	92.5	17.3	World's toughest ultra-fine grained carbide	PCB Microdrills, Mini-tools, Punches
	AF0	0.5	10.0	4.1	93.0	18.1	Tough, wear-resistant ultra-fine grained carbide	Material Dedicated for Microdrills and Routers
	AFU	0.5	8.0	3.8	93.6	19.4	Wear-resistant ultra-fine grained carbide	PCB Drills, Endmills for High-Hardness Materials
Micro-fine Grained Carbide	**A1**	0.7	13.0	4.2	91.4	15.6	Tough micro-fine grained carbide	Endmills, Taps, Drills for Cast Iron, Punches
	KH12	0.7	10.0	4.0	92.4	17.0	Micro-fine grained carbide with excellent wear resistance and toughness	Endmills, Drills for Steel
	KH15	0.7	12.0	4.4	92.0	16.3	Micro-fine grained carbide with a balance of hardness and strength	Endmills for Exotic Alloys
	F0	0.7	5.0	3.6	93.6	20.1	Micro-fine grained carbide with superior wear resistance	PCB Drills, Routers
Micro-grained Carbide	**KH03**	1.0	10.0	3.8	91.4	15.2	Micro-grained carbide with excellent strength and toughness	Molds/Dies, Drills, Endmills
	KH05	1.0	13.0	3.5	90.4	13.6	Tough micro-grained carbide	Molds/Dies
	H1	1.0	5.0	3.3	93.2	17.7	Micro-grained carbide with superior wear resistance	Drills for Cast Iron and High-Hardness, Reamers
	EH10	1.2	6.0	3.4	92.4	17.3	Micro-grained carbide with a balance of hardness and strength	Drills for Exotic Alloy, Reamers
	ZF16A	1.0	6.0	3.5	93.0	17.6	Wear and chipping resistant micro-grained carbide for high-speed machining	Material Dedicated for PCB Drills

*1 Grain size shown is the average grain size of the WC (tungsten carbide) material. *2 Transverse rupture strength differs between round bars and plates.

Carbide Material Features and Applications

■ Structure

● Ultra-fine Grained Carbide

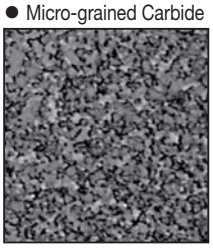


AF1
Average Grain Size: 0.5μm

● Micro-fine Grained Carbide

KH12
Average Grain Size: 0.7μm

● Micro-grained Carbide



KH03
Average Grain Size: 1.0μm

■ Recommended Grades by Application and Work Material (◎: Best, ○: Good)

Grade	Applications					Work Material								
	Endmills	Drills	Reamers	PCB Drills/ Routers	Non-cutting Tool Use	Mild Steel	General Steel	Hardened Steel	Stainless Steel	Titanium Alloy	Inconel	Cast Iron	Aluminum Alloy	Copper Alloy
XF1	●	●				○	○	◎	◎		◎			
				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
AF1	●	●			●	○	○							
				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
AF0				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
AFU	●					○	○	◎						
				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
A1	●	●			●	○	○		○					
			●			○	○							
KH12	●	●				◎	◎	○	○	○	○	○	○	○
KH15	●					◎	◎	○	◎	◎	◎			
F0				●		Refer to page K7 for the recommended grades for PCB drills and routers.								
KH03	●					○	○	○	○	◎	◎			
		●				◎	◎	○	○	◎	◎	◎		
KH05					●	Cannot be used as cutting tool material.								
H1	●	●										◎	◎	◎
			●			○	○	○	○			◎	◎	◎
EH10	●	●						○	○	◎	◎	◎	◎	◎
			●			○	○	○	○	◎	◎	◎	○	○
ZF16A				●		Refer to page K7 for the recommended grades for PCB drills and routers.								

Plate Blanks

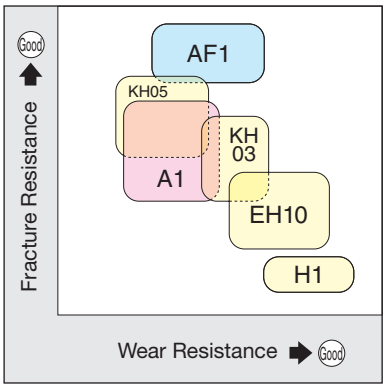
A comprehensive stocked range of grades in carbide plate blanks for mold and die materials, as well as carbide rods for drill or reamer materials.

■ Grades

- **Ultra-fine Grained Carbide AF1**
  With grains finer than that of conventional grades, an excellent balance of high toughness and high hardness as well as superior edge sharpness is achieved.
- **Micro-fine Grained Carbide A1**
  Micro-fine grained carbide A1 is a best-selling general-purpose grade with high wear resistance and toughness.
- **Micro-grained Carbide H1**
  Reliable grade for machining non-ferrous metals.
- **Basic Carbide EH10**
  Highly evaluated grade for general machining of cast iron and exotic alloys. Perfect for drills and reamers.
- **KH series**
  · KH03: Has strength (transverse rupture strength) and hardness similar to A1, with greatly improved chipping resistance that is comparable to ultra-fine grained grades.
  · KH05: With a higher cemented carbide binder content than KH03, this grade has even greater strength (transverse rupture strength) and chipping resistance.

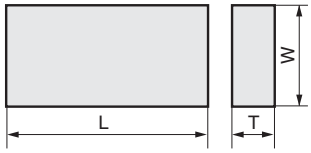
■ Properties and Applications

Grade	Hardness		Transverse Rupture Strength	Applications	
	HRA	HV(GPa)	TRS(GPa)		
A1	91.4	15.6	3.3	Endmills	IT Mold Punches
AF1	92.5	17.3	4.4	Small Drills	
KH03	91.4	15.2	3.3	Molds/Dies	
KH05	90.4	13.6	3.5		
EH10	92.4	17.3	3.4	Drills, Reamers	
H1	93.2	17.7	2.4		



Ultra-fine grained carbide (AF1) is specially developed for the manufacturing of carbide mold parts (punches) with a variety of sizes in stock.

Fig 1



■ Stock

Dimensions (mm)

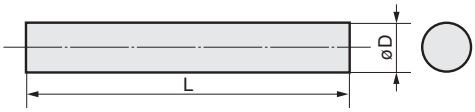
Cat. No.	T		L		W		Grade				Fig
	Nominal Size	Tolerance	Nominal Size	Tolerance	Nominal Size	Tolerance	A1	AF1	KH03	KH05	
0B10060012	1.2	+0.5 +0.2	100	+1.5 0	60	+1.0 0	●	●	●	●	1
0B10060015	1.5						●	●	●	●	1
0B10060020	2.0						●	●	●	●	1
0B10060025	2.5						●	●	●	●	1
0B10060030	3.0						●	●	●	●	1
0B10060040	4.0						●	●	●	●	1
0B15060020	2.0	+0.5 +0.2	150	+1.5 0	60	+1.0 0	●	●	●	●	1
0B15060025	2.5						●	●	●	●	1
0B15060030	3.0						●	●	●	●	1
0B15060035	3.5						●	●	●	●	1
0B15060040	4.0						●	●	●	●	1
0B15060045	4.5						●	●	●	●	1
0B15060050	5.0						●	●	●	●	1
0B15060055	5.5						●	●	●	●	1
0B15060060	6.0						●	●	●	●	1
0B15060070	7.0						●	●	●	●	1
0B15060080	8.0						●	●	●	●	1
0B15060090	9.0						●	●	●	●	1
0B15060100	10.0						●	●	●	●	1

Plates with top and bottom faces ground can be made to order.

Rod Blanks

IGETALLOY grades ideal for applications such as endmills, drills and reamers where edge strength, toughness and wear resistance are essential.

Fig 1



Stock

● Length L = 310

Dimensions (mm)

Cat. No.	ø D		L		Grade				Fig
	Nominal Size	Tolerance	Nominal Size	Tolerance	A1	AF1	EH10	H1	
AR010310	1.0	+0.3 +0.2	310	+6.0 0	*	*	*	*	1
AR015310	1.5				*	*	*	*	1
AR020310	2.0				*	*	*	*	1
AR025310	2.5				*	*	*	*	1
AR030310	3.0	+0.5 +0.3			*	*	*	*	1
AR035310	3.5				*	*	*	*	1
AR040310	4.0				*	*	*	*	1
AR045310	4.5				*	*	*	*	1
AR050310	5.0				*	*	*	*	1
AR055310	5.5				*	*	*	*	1
AR060310	6.0				*	*	*	*	1
AR065310	6.5				*	*	*	*	1
AR070310	7.0				*	*	*	*	1
AR075310	7.5				*	*	*	*	1
AR080310	8.0				*	*	*	*	1
AR090310	9.0	+0.6 +0.3			*	*	*	*	1
AR100310	10.0				*	*	*	*	1
AR110310	11.0				*	*	*	*	1
AR120310	12.0				*	*	*	*	1
AR130310	13.0								1
AR140310	14.0				*	*	*	*	1
AR150310	15.0								1
AR160310	16.0	+0.7 +0.3			*	*	*	*	1
AR170310	17.0								1
AR180310	18.0				*	*	*	*	1
AR190310	19.0								1
AR200310	20.0				*	*	*	*	1

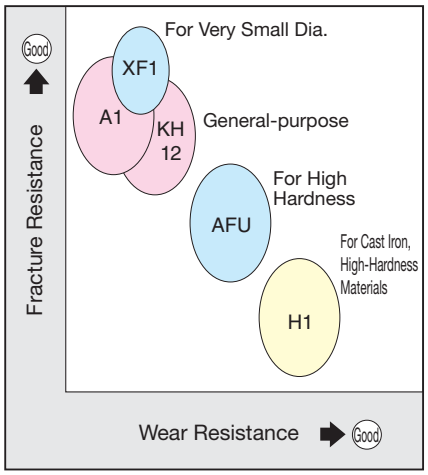
Ground rods can be made to order.

Items marked * are semi-standard stock.
Please inquire about stock availability when ordering.

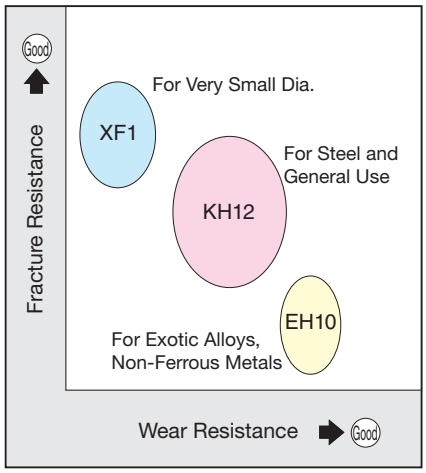
· For length requirements other than L=310mm, refer to "Special Rod Blanks" on page K6 for the available made-to-order specifications.

Special Rod Blanks

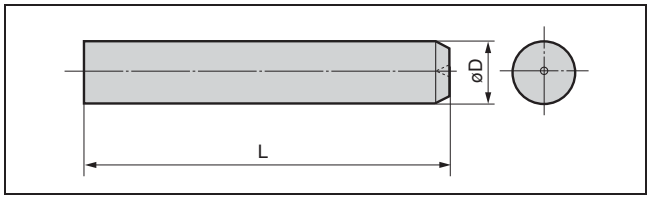
Endmill Blanks



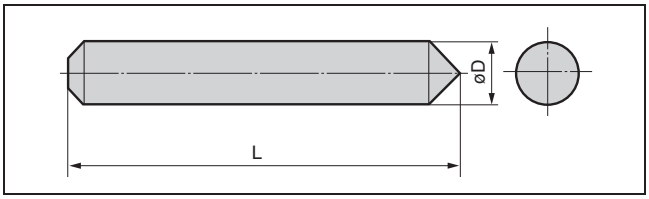
Drill Blanks



Endmill Mill-scale Blank Shapes (Example)



Drill Mill-scale Blank Shapes (Example)



O.D.

Dimensions (mm)

øD	Tolerance
1.0 ≤ D < 3.0	+ 0.3 + 0.2
3.0 ≤ D ≤ 8.0	+ 0.5 + 0.3
8.0 < D ≤ 15.0	+ 0.6 + 0.3
15.0 < D ≤ 25.0	+ 0.7 + 0.3

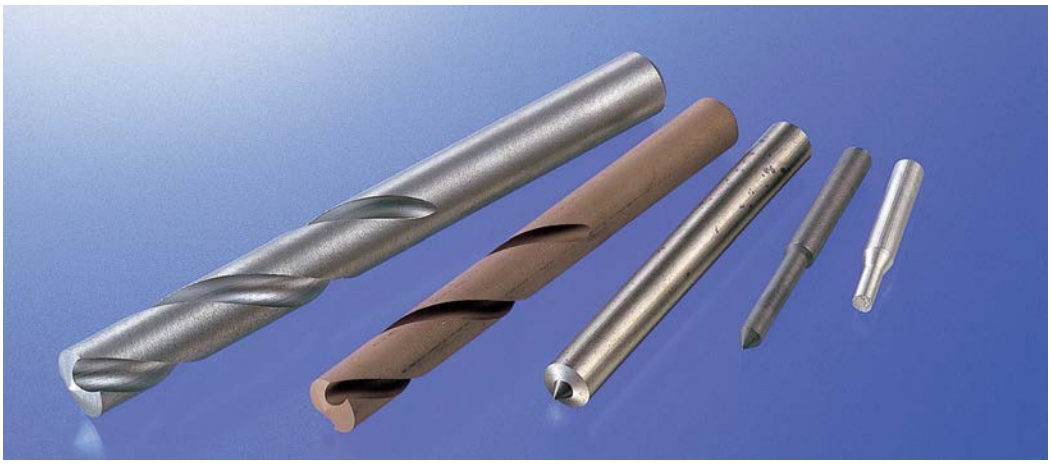
Rods with steps can be made to order.
*XF1 is available up to ≤ ø16.

Overall Length

Dimensions (mm)

L	Tolerance	Warpage
40 ≤ L < 310	Overall Length ± 0.5%	0.15
310 ≤ L ≤ 330	Overall Length + 6.0 0	

Ground rods can be made to order.

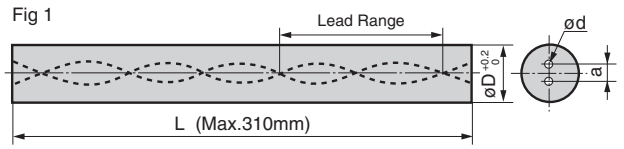


Special Rod Blanks

Drill Blanks with Oil Holes

Shape (Example)

Fig 1

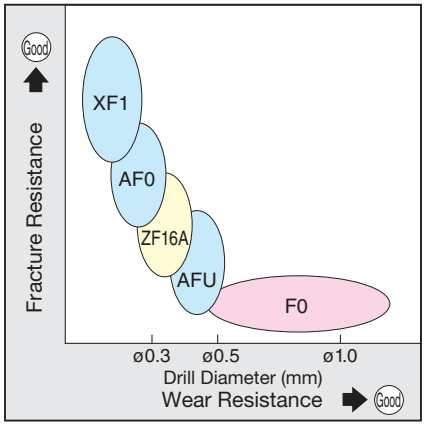


Right-hand Helix 30°, 2 Holes

Dimensions (mm)

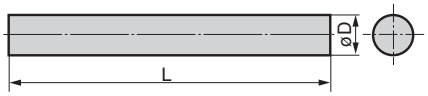
Applications	External øD	Core Diameter øD1	Hole Dia. ød	Oil Hole Pitch a	Lead Range	Grade KH12	Grade KH03	Fig
For Straight Drills	3.6	3.3	0.47±0.05	1.5 $^{0}_{-0.1}$	15.7 to 17.0			1
	4.6	4.3	0.59 $^{+0.05}_{-0.1}$	1.7 $^{0}_{-0.2}$	20.9 to 22.7			1
	5.6	5.3	0.71±0.1	2.4 $^{0}_{-0.3}$	26.2 to 28.4			1
	6.6	6.3	0.83±0.1	2.8±0.2	31.4 to 34.0			1
	7.6	7.3	0.95±0.1	3.2±0.2	36.6 to 39.7			1
	8.6	8.3	1.06±0.1	3.6±0.2	41.9 to 45.4			1
	9.6	9.3	1.18±0.2	4.0±0.2	47.1 to 51.0			1
	10.6	10.3	1.30±0.2	4.4±0.2	52.3 to 56.7			1
	11.6	11.3	1.30±0.2	4.4±0.2	57.5 to 62.4			1
	12.6	12.3	1.42±0.2	4.8±0.2	62.8 to 68.1			1
	13.6	13.3	1.54±0.2	5.2±0.2	68.0 to 73.7			1
	14.6	14.3	1.66±0.2	5.6±0.2	73.2 to 79.4			1
	15.6	15.3	1.77±0.2	6.0±0.2	78.5 to 85.1			1
	16.6	16.3	1.89±0.2	6.4±0.2	83.7 to 90.7			1
	17.6	17.3	1.75±0.2	8.5±0.2	88.9 to 96.3	—		1
	17.6	17.3	2.01±0.2	6.8±0.2	88.9 to 96.3		—	1
	18.6	18.3	2.00±0.2	9.2±0.2	94.1 to 102.0	—		1
	18.6	18.3	2.13±0.2	7.2 ±0.2	94.1 to 102.0		—	1
	19.6	19.3	2.00±0.2	9.7±0.2	99.3 to 107.7	—		1
	19.6	19.3	2.28±0.2	7.6 ±0.2	99.3 to 107.7		—	1
	20.6	20.3	2.00±0.2	9.9±0.2	104.6 to 113.4	—		1
	20.6	20.3	2.36±0.2	8.0±0.2	104.6 to 113.4		—	1
For Stepped Drills	3.6	3.3	0.23±0.05	0.8 $^{-0.1}_{-0.2}$	15.7 to 17.0			1
	3.6	3.3	0.35±0.05	1.2 $^{0}_{-0.2}$	15.7 to 17.0			1
	4.6	4.3	0.35±0.05	1.2 $^{0}_{-0.2}$	20.9 to 22.7			1
	5.6	5.3	0.47±0.05	1.5 $^{0}_{-0.3}$	26.2 to 28.4			1
	6.6	6.3	0.47±0.1	2.0±0.2	31.4 to 34.0			1
	7.6	7.3	0.59±0.1	2.0±0.2	36.6 to 39.7			1
	8.6	8.3	0.71±0.1	2.4±0.2	41.9 to 45.4			1
	9.6	9.3	0.83±0.1	2.8±0.2	47.1 to 51.0			1
	10.6	10.3	0.95±0.1	3.2±0.2	52.3 to 56.7			1
	11.6	11.3	0.95±0.1	3.2±0.2	57.5 to 62.4			1
	12.6	12.3	1.06±0.1	3.6±0.2	62.8 to 68.1			1
	13.6	13.3	1.06±0.1	3.6±0.2	68.0 to 73.7			1
	14.6	14.3	1.18±0.2	4.0±0.2	73.2 to 79.4			1
	15.6	15.3	1.30±0.2	4.4±0.2	78.5 to 85.1			1
	16.6	16.3	1.42±0.2	4.8±0.2	83.7 to 90.7			1

PCB Drill Blanks



Shape (Example)

Fig 2



Solid type

Dimensions (mm)

øD	L	Fig
2.15 ±0.05	32.0 $^{+0.9}_{+0.4}$	2
3.25 ±0.02	38.1 $^{+1.0}_{+0.4}$	2

Other sizes can be made to order.

Composite type (Rough Ground)

Dimensions (mm)

øD	L	Fig
1.0 to 1.8 ±0.05	333 $^{+2.0}_{0}$	2

Consult us about dimensions.
Centreless grinding can be performed.

Grade Application (◎: Best, ○: Good)

·By Tool Diameter

Dimensions (mm)

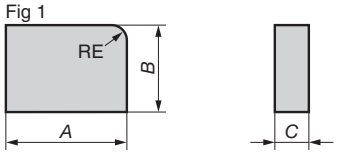
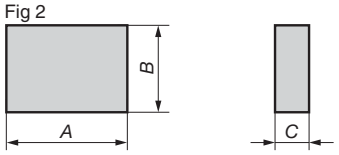
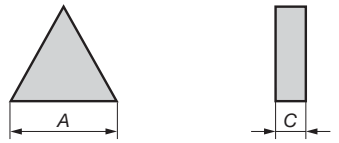
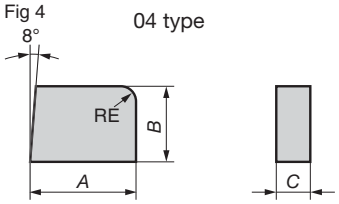
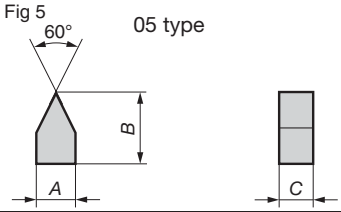
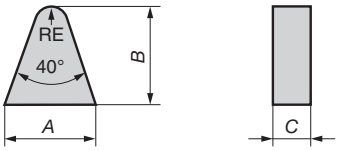
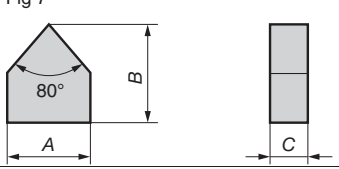
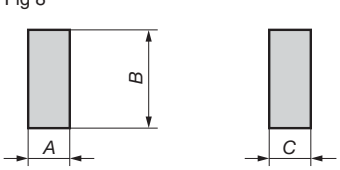
Grade	Very Small Diameter (up to ø0.15)	Small Diameters (up to ø0.45)	General Diameters (ø0.50 up)
XF1	◎	○	
AF0	○	◎	
AFU		◎	
ZF16A		○	○
F0			◎

·By Application

Grade	Hardened Steel	High-speed Machining	Stacked Plates	Routers
XF1		○		○
AF0		○	◎	○
AFU	◎	○	○	
ZF16A	○	◎		
F0	◎		○	◎

JIS type Inserts for Carbide Tool Holders

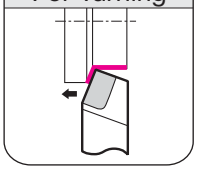
Dimensions (mm)

Shape	Cat. No.	Cemented Carbide: P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E			M (Stainless Steel) M20 U2	M40 A40		K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	A	B	C	RE	Typical Applicable Holders	Fig
01 type Fig 1 	01-0		●	●					●				●	●	●	10	6	3	4	31 type 32 type 45 type 46 type	1
	01-1		●	●					●		●		●	●		13	9	3	5		1
	01-2			●				●	●		●	●		●		16	11	4	5		1
	01-3		●	●				●			●			●	●	19	13	5	5		1
	01-4		●					●	●				●	●	●	22	15	6	8		1
	01-5															25	17	7	8		1
	01-6															30	20	8	8		1
02 type Fig 2 	02-0	●	●	●				●	●		●	●	●	●	●	10	6	3	—	41 type 42 type	2
	02-1	●	●	●				●	●		●		●	●	●	13	9	3	—		2
	02-2	●	●	●	●			●	●		●	●	●	●	●	16	11	4	—		2
	02-3	●	●		●			●	●		●	●	●	●	●	19	13	5	—		2
	02-4	●	●	●				●	●		●	●	●	●	●	22	15	6	—		2
	02-5															25	17	7	—		2
	02-6															30	20	8	—		2
03 type Fig 3 	03-0															10	—	3	—	37 type 38 type 47 type 48 type	3
	03-1										●					12	—	3	—		3
	03-2	●	●	●				●	●				●		●	15	—	4	—		3
	03-3							●					●	●		18	—	5	—		3
	03-4													●		24	—	6	—		3
	03-5															24	—	7	—		3
	03-6															28	—	8	—		3
Fig 4  04 type	04-0							●						●		10	6	3	4	33 type 34 type	4
	04-1		●											●		13	9	3	5		4
	04-2	●	●	●				●			●	●				16	11	4	5		4
	04-3		●						●		●		●			19	13	5	5		4
	04-4	●		●									●	●		22	15	6	8		4
	04-5															25	17	7	8		4
	04-6															30	20	8	8		4
Fig 5  05 type	05-1								●					●		5	8	3	—	49 type 50 type 51 type 52 type	5
	05-2							●			●	●				6	10	4	—		5
	05-3			●										●		7	12	5	—		5
	05-4		●	●					●					●		9	16	6	—		5
	05-5															10	18	7	—		5
	05-6															11	20	8	—		5
Fig 6  06 type	06-0		●					●	●							10	10	3	2	36 type 39 type 40 type	6
	06-1							●	●				●			13	13	3	2.5		6
	06-2	●	●					●			●	●	●	●	●	16	16	4	3		6
	06-3	●	●	●				●	●		●	●	●	●		19	19	5	4		6
	06-4		●	●					●		●	●		●		22	22	6	4		6
	06-5															25	25	7	5		6
	06-6															30	30	8	6		6
Fig 7  07 type	07-0		●								●			●		10	10	3	—	35 type	7
	07-1															13	13	3	—		7
	07-2		●													16	16	4	—		7
	07-3		●								●		●	●		19	19	5	—		7
	07-4											●	●		●	25	20	6	—		7
	07-5															25	22	7	—		7
	07-6															30	25	8	—		7
Fig 8  08 type	08-1			●				●	●		●		●		●	3	8	3	—	43 type	8
	08-3	●	●	●				●	●		●		●	●		4	13	4	—		8
	08-4	●	●	●	●			●	●		●	●	●	●	●	5	15	5	—		8
	08-5												●			6	17	6	—		8
	08-6												●			8	20	8	—		8

JIS type Carbide Tool Holders

Dimensions (mm)

31 type (Right-handed)
32 type (Left-handed)
For Turning



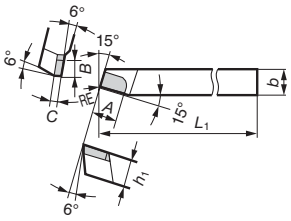
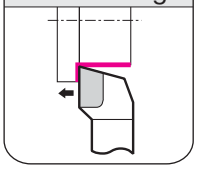
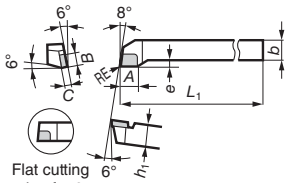


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
31-1			●										13	13	100	—	—	13	9	3	0.5	01-1
31-2			●			●					●		16	16	120	—	—	16	11	4	0.5	01-2
31-3			●	●		●			●	●	●		19	19	140	—	—	19	13	5	0.5	01-3
31-4	*		●			●			●		●	●	25	25	160	—	—	22	15	6	1	01-4
31-5	—												25	30	180	—	—	25	17	7	1	01-5
31-6	—												30	35	200	—	—	30	20	8	1	01-6
32-1			●	●			●						13	13	100	—	—	13	9	3	0.5	01-1
32-2				●			●						16	16	120	—	—	16	11	4	0.5	01-2
32-3			●	●		●					●		19	19	140	—	—	19	13	5	0.5	01-3
32-4	*		●	●			●		●		●		25	25	160	—	—	22	15	6	1	01-4
32-5	—												25	30	180	—	—	25	17	7	1	01-5
32-6	—												30	35	200	—	—	30	20	8	1	01-6

33 type (Right-handed)
34 type (Left-handed)
For Turning



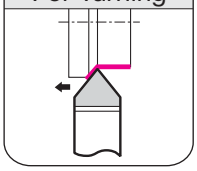


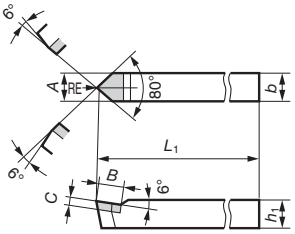
Flat cutting edge for 0 type

Figure shows right-handed tool.

Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
33-0		●	●	●		●	●		●	●	●	●	10	10	80	0	—	10	6	3	0.3	04-0
33-1			●	●		●	●	●	●	●	●	●	13	13	100	4	—	13	9	3	0.5	04-1
33-2	●	●	●	●		●	●	●	●	●	●	●	16	16	120	4	—	16	11	4	0.5	04-2
33-3	●	●	●	●	●	●	●	●	●	●	●	●	19	19	140	5	—	19	13	5	0.5	04-3
33-4	*	●	●	●	●	●	●	●	●	●	●	●	25	25	160	5	—	22	15	6	1	04-4
33-5	—												25	30	180	6	—	25	17	7	1	04-5
33-6	—												30	35	200	6	—	30	20	8	1	04-6
34-0			●	●		●			●	●	●	●	10	10	80	0	—	10	6	3	0.3	04-0
34-1		●	●	●		●	●		●	●	●	●	13	13	100	4	—	13	9	3	0.5	04-1
34-2	●		●	●		●	●		●	●	●		16	16	120	4	—	16	11	4	0.5	04-2
34-3	●		●	●	●	●	●		●	●	●	●	19	19	140	5	—	19	13	5	0.5	04-3
34-4	*		●	●		●	●		●	●	●	●	25	25	160	5	—	22	15	6	1	04-4
34-5	—												25	30	180	6	—	25	17	7	1	04-5
34-6	—												30	35	200	6	—	30	20	8	1	04-6

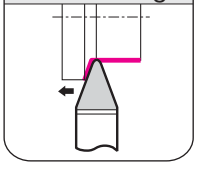
35 type
For Turning

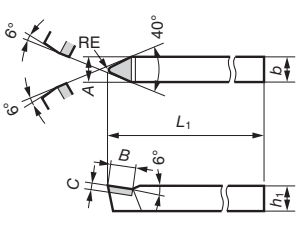




Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
35-0		●	●				●		●	●	●	●	10	10	80	—	—	10	10	3	0.3	07-0
35-1		●	●			●	●		●	●	●	●	13	13	100	—	—	13	13	3	0.5	07-1
35-2		●	●	●		●	●		●	●	●		16	16	120	—	—	16	16	4	0.5	07-2
35-3		●	●	●		●	●		●	●	●	●	19	19	140	—	—	19	19	5	0.5	07-3
35-4	*		●	●		●	●		●		●	●	25	25	160	—	—	22	20	6	1	07-4
35-5	—												25	30	180	—	—	25	22	7	1	07-5
35-6	—												30	35	200	—	—	30	25	8	1	07-6

36 type
For Turning





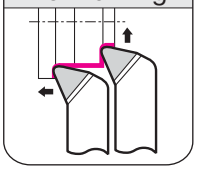
Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) P10 ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) M20 U2	M40 A40	K (Cast Iron) K01 H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
36-0		●	●	●					●	●	●		10	10	80	—	—	10	10	3	2	06-0
36-1		●	●	●		●	●	●	●	●	●	●	13	13	100	—	—	13	13	3	2	06-1
36-2	●	●	●	●		●	●	●	●	●	●	●	16	16	120	—	—	16	16	4	3	06-2
36-3	●	●	●	●	●	●	●	●	●	●	●	●	19	19	140	—	—	19	19	5	4	06-3
36-4	*	●	●	●		●	●		●	●	●	●	25	25	160	—	—	22	22	6	4	06-4
36-5	—												25	30	180	—	—	25	25	7	5	06-5
36-6	—												30	35	200	—	—	30	30	8	5	06-6

Items marked * follow the insert dimensions of the ○○**-3** type (one size smaller) in their category. <Made to order>

JIS type Carbide Tool Holders

Dimensions (mm)

37 type (Right-handed)
38 type (Left-handed)
For Turning



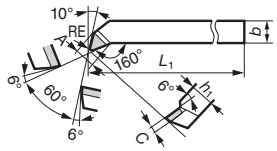
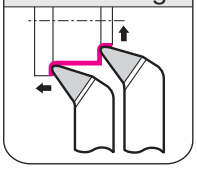


Figure shows right-handed tool.

39 type (Right-handed)
40 type (Left-handed)
For Turning



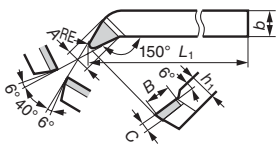
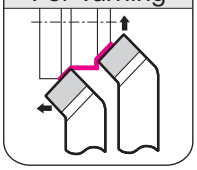


Figure shows right-handed tool.

41 type (Right-handed)
42 type (Left-handed)
For Turning



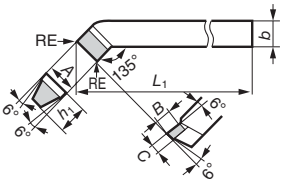
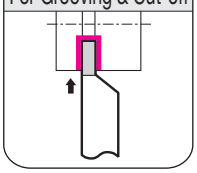
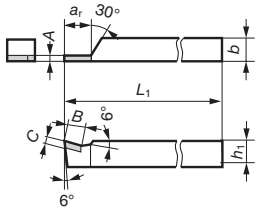


Figure shows right-handed tool.

43 type
For Grooving & Cut-off





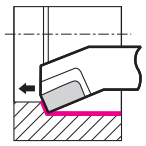
Shape	Cat. No.	Cermet	Cemented Carbide: P (Steel)						Cemented Carbide: M (Stainless Steel)		Cemented Carbide: K (Cast Iron)					Shank					Insert				Applicable Insert
			P10	P20	P30	P40			M20	M40	K01	K01	K10	K20	K20										
		T1200A	ST10P	ST20E	ST30E	ST40E			U2	A40	H3	H2	H1	G10E	G2	b	h_1	L_1	e	a_r	A	B	C	RE	
37 type (Right-handed) 38 type (Left-handed) For Turning	37-1			●									●	●		13	13	100	—	—	12	—	3	0.5	03-1
	37-2		●	●					●			●	●	●		16	16	120	—	—	15	—	4	0.5	03-2
	37-3		●	●	●				●	●		●	●	●		19	19	140	—	—	18	—	5	0.5	03-3
	37-4	*	●	●	●				●			●		●		25	25	160	—	—	24	—	6	1	03-4
	37-5	—														25	30	180	—	—	24	—	7	1	03-5
	37-6	—														30	35	200	—	—	28	—	8	1	03-6
	38-1			●										●		13	13	100	—	—	12	—	3	0.5	03-1
	38-2			●									●	●		16	16	120	—	—	15	—	4	0.5	03-2
	38-3		●	●	●				●				●	●		19	19	140	—	—	18	—	5	0.5	03-3
	38-4	*		●	●								●	●		25	25	160	—	—	24	—	6	1	03-4
	38-5	—														25	30	180	—	—	24	—	7	1	03-5
	38-6	—														30	35	200	—	—	28	—	8	1	03-6
39 type (Right-handed) 40 type (Left-handed) For Turning	39-0		●	●					●	●			●	●		10	10	80	—	—	10	10	3	2	06-0
	39-1		●	●	●				●	●	●	●	●	●	●	13	13	100	—	—	13	13	3	2	06-1
	39-2	●	●	●	●				●	●	●	●	●	●	●	16	16	120	—	—	16	16	4	3	06-2
	39-3	●	●	●	●				●	●	●	●	●	●	●	19	19	140	—	—	19	19	5	4	06-3
	39-4	*	●	●	●				●	●		●	●	●	●	25	25	160	—	—	22	22	6	4	06-4
	39-5	—														25	30	180	—	—	25	25	7	5	06-5
	39-6	—														30	35	200	—	—	30	30	8	5	06-6
	40-0			●												10	10	80	—	—	10	10	3	2	06-0
	40-1		●	●	●					●			●	●	●	13	13	100	—	—	13	13	3	2	06-1
	40-2		●	●	●				●	●			●	●	●	16	16	120	—	—	16	16	4	3	06-2
	40-3		●	●	●				●	●		●	●	●	●	19	19	140	—	—	19	19	5	4	06-3
	40-4	*		●	●				●			●	●	●	●	25	25	160	—	—	22	22	6	4	06-4
	40-5	—														25	30	180	—	—	25	25	7	5	06-5
	40-6	—														30	35	200	—	—	30	30	8	5	06-6
41 type (Right-handed) 42 type (Left-handed) For Turning	41-1		●	●						●				●		13	13	100	—	—	13	9	3	0.5	02-1
	41-2		●	●					●	●		●		●		16	16	120	—	—	16	11	4	0.5	02-2
	41-3		●	●	●				●	●		●	●	●	●	19	19	140	—	—	19	13	5	0.5	02-3
	41-4	*	●	●	●					●			●	●	●	25	25	160	—	—	22	15	6	1	02-4
	41-5	—														25	30	180	—	—	25	17	7	1	02-5
	41-6	—														30	35	200	—	—	30	20	8	1	02-6
	42-1			●										●		13	13	100	—	—	13	9	3	0.5	02-1
	42-2			●						●				●		16	16	120	—	—	16	11	4	0.5	02-2
	42-3		●	●	●				●	●				●		19	19	140	—	—	19	13	5	0.5	02-3
	42-4	*		●	●					●			●	●	●	25	25	160	—	—	22	15	6	1	02-4
	42-5	—														25	30	180	—	—	25	17	7	1	02-5
	42-6	—														30	35	200	—	—	30	20	8	1	02-6
43 type For Grooving & Cut-off	43-1		●	●					●	●		●	●	●		10	16	100	—	13	3	8	3	—	08-1
	43-2		●	●	●				●	●		●	●	●		13	19	120	—	16	3	8	3	—	08-1
	43-3	●	●	●	●				●	●		●	●	●	●	16	22	140	—	19	4	13	4	—	08-3
	43-4	*	●	●	●				●	●		●	●	●	●	19	25	160	—	25	5	15	5	—	08-4
	43-5	—														22	32	180	—	30	6	17	6	—	08-5
	43-6	—														25	38	200	—	40	8	20	8	—	08-6

Items marked * follow the insert dimensions of the ○○**-3** type (one size smaller) in their category. <Made to order>

JIS type Carbide Tool Holders

Dimensions (mm)

45 type (Right-handed)
46 type (Left-handed)
For Internal Boring



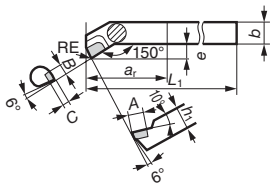
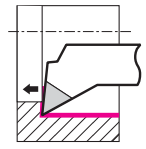


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) U2	M40 A40	K (Cast Iron) H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
45-1													13	13	140	7	50	10	6	3	0.5	01-0
45-2			●										16	16	160	9	60	13	9	3	0.5	01-1
45-3			●										19	19	190	11	80	16	11	4	0.5	01-2
45-4			●										25	25	230	13	100	19	13	5	1	01-3
46-1													13	13	140	7	50	10	6	3	0.5	01-0
46-2													16	16	160	9	60	13	9	3	0.5	01-1
46-3													19	19	190	11	80	16	11	4	0.5	01-2
46-4													25	25	230	13	100	19	13	5	1	01-3

47 type (Right-handed)
48 type (Left-handed)
For Boring



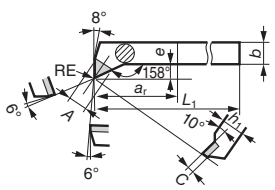
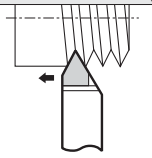


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) U2	M40 A40	K (Cast Iron) H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
47-1		●	●								●		13	13	140	7	50	10	—	3	0.5	03-0
47-2		●	●								●		16	16	160	8	60	12	—	3	0.5	03-1
47-3			●								●		19	19	190	9	80	15	—	4	0.5	03-2
47-4			●								●		25	25	230	10	100	18	—	5	1	03-3
48-1													13	13	140	7	50	10	—	3	0.5	03-0
48-2													16	16	160	8	60	12	—	3	0.5	03-1
48-3													19	19	190	9	80	15	—	4	0.5	03-2
48-4													25	25	230	10	100	18	—	5	1	03-3

49 type (Right-handed)
50 type (Left-handed)
For External Threading



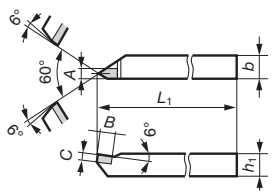
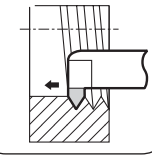


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) U2	M40 A40	K (Cast Iron) H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
49-1			●										13	13	100	—	—	5	8	3	—	05-1
49-2			●										16	16	120	—	—	6	10	4	—	05-2
49-3		●	●	●		●					●		19	19	140	—	—	7	12	5	—	05-3
49-4		●	●	●		●					●		25	25	160	—	—	9	16	6	—	05-4
50-1													13	13	100	—	—	5	8	3	—	05-1
50-2													16	16	120	—	—	6	10	4	—	05-2
50-3													19	19	140	—	—	7	12	5	—	05-3
50-4													25	25	160	—	—	9	16	6	—	05-4

51 type (Right-handed)
52 type (Left-handed)
For Internal Threading



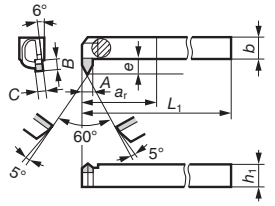
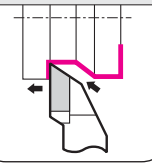
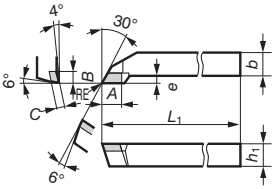


Figure shows right-handed tool.

Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) U2	M40 A40	K (Cast Iron) H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
51-1			●								●		13	13	140	8	50	5	8	3	—	05-1
51-2			●										16	16	160	10	60	6	10	4	—	05-2
51-3			●			●					●		19	19	190	12	80	7	12	5	—	05-3
51-4			●										25	25	230	16	100	9	16	6	—	05-4
52-1													13	13	140	8	50	5	8	3	—	05-1
52-2													16	16	160	10	60	6	10	4	—	05-2
52-3													19	19	190	12	80	7	12	5	—	05-3
52-4													25	25	230	16	100	9	16	6	—	05-4

95 type
For External Profiling





Cat. No.	Cermet T1200A	Cemented Carbide P (Steel) ST10P	P20 ST20E	P30 ST30E	P40 ST40E	M (Stainless Steel) U2	M40 A40	K (Cast Iron) H3	K01 H2	K10 H1	K20 G10E	K20 G2	Shank b	h_1	L_1	e	a_r	Insert A	B	C	RE	Applicable Insert
95-1		●											25	25	160	5	—	20	10	7	1.7	09-E

SUMIBORON L

L1 to L150

Guidance for SUMIBORON Grades	SUMIBORON series L2
	Coated SUMIBORON series L3
	Grade Guidance - Hardened Steel Machining L4
	Grade Guidance - Cast Iron Machining L7
	Grade Guidance - Sintered Component Machining L9
	Grade Guidance - Roll/Hard Facing Alloys/Hardened Stainless Steel Machining ... L10
	Grade Guidance - Titanium Alloy/Heat-Resistant Alloy Machining ... L11
	Coated SUMIBORON Series for Hardened Steel Machining BNC2115/BNC2125/BNC2010/BNC2020/New BNC2105 ..... L12
	Coated SUMIBORON/BNC300/SUMIBORON BN350 ..... L16
	SUMIBORON BN1000/BN2000 ..... L18
	SUMIBORON New BN7125/BN7115 ..... L20
	Coated SUMIBORON/BNC8115/SUMIBORON BNS8125 ..... L22
	Coated SUMIBORON BNC500 ..... L24
	SUMIBORON BINDERLESS NCB100 ..... L26
Inserts	SUMIBORON Insert Identification Code L28
	SUMIBORON BREAK MASTER FV type / LV type / SV type L30
	SUMIBORON One-Use Wiper Inserts WG type / WH type L31
	SUMIBORON Cutting Edge Specification L32
	Stock Table for SUMIBORON Indexable Inserts L34
Holders	SEC-Tool Holders for Solid SUMIBORON L122
	Inserts & Special Holders for High-efficiency Machining L126
	Small Diameter Boring Bars BSME series / Expansion SEXC series L130
	SUMIBORON Small Hole Boring Bars Expansion BNBX type L134
	SUMIBORON Small Hole Boring Bars Expansion BNZ type L135
	SUMIBORON Small Hole Boring Bars Expansion BNB type L136
	SUMIBORON Small Diameter Round Insert Holders TRGT type L137
	SUMIBORON Round Insert Holders PR type L138
	SUMIBORON Tool Holder for Roll Turning BNRN type L139
	SUMIBORON Grooving Tools GWB type L140
	SUMIBORON Grooving Tools BNGG type L141
Cutters/ Endmills	SUMIBORON BN Finish Mill EASY FMU type / FMU-E type L142
	SUMIBORON BN Finish Mill FM type / FMF type L144
	SUMIBORON RM type L145
	Mold Finish Master BNBR type / BNBP type / BNBC type L146

Stock Markings and Symbols

●● mark: Standard stocked item
● mark: To be replaced with the new item featured on the same page
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
* mark: Semi-standard stock (please confirm stock availability)
○ mark: Stock or planned stock (please confirm stock availability)
Blank: Made-to-order item
— mark: Not available

SUMIBORON

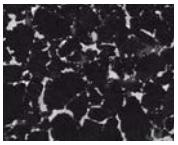
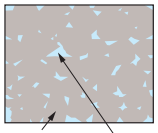
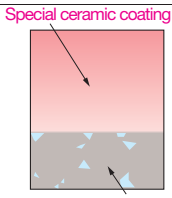
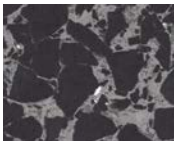
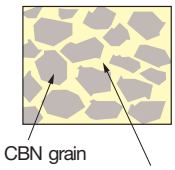
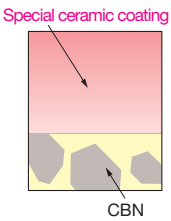
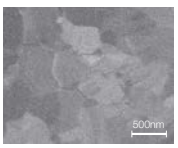
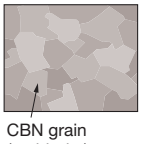
■ General Features

Sintered CBN tool "SUMIBORON", which has CBN (cubic boron nitride) - a hard material second only to diamond - as its main component, is sintered with a metal or special ceramic binder under ultra-high pressure and temperature. SUMIBORON has high hardness, excellent thermal resistance and excellent properties including being unreactive to ferrous metals, enabling exotic alloys, hardened steel or hard cast iron to be machined. Excellent efficiency and longer tool life can also be achieved from high-speed finishing of cast iron. "SUMIBORON" was first successfully developed in Japan by our company in 1977. Our product lineup also includes "Coated SUMIBORON" with a special ceramic coating and "SUMIBORON BINDERLESS" made by directly bonding CBN particles without a binder.

■ Features

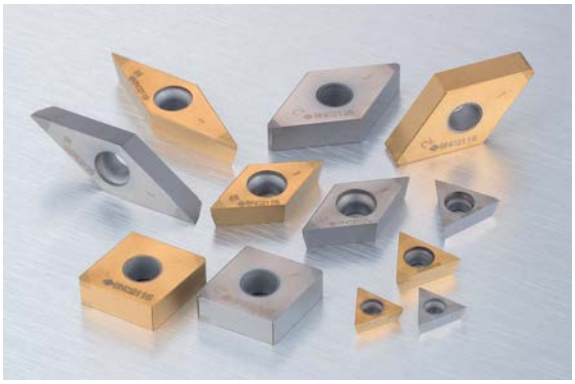
The sintered CBN tool SUMIBORON is mainly used for the machining of ferrous metals due to its low chemical reactivity with iron. There are 4 different classifications of SUMIBORON as follows:

■ Classifications/Applications

	Classifications	Structure	Diagram	Grade	Work Material
(A)	With a high CBN content, where each grain is fused together, this group can be used for the machining of high-hardness materials like cast iron, heat-resistant alloys and sintered alloys.		 CBN grain Metal binder	New BN7125 BN7000 BN700	K (FC) Sintered Alloy S
				BN7115	Sintered Alloy
				BN7500	Sintered Alloy
				BNS8125	K (FC/FCD) S
			 Special ceramic coating CBN	BNC8115	K (FC/FCD) S H
(B)	CBN grains are held together by a special ceramic binder with a strong binding force provides excellent wear resistance and toughness in the machining of hardened steel and cast iron.		 CBN grain Ceramic binder	BN1000 BN2000 BN350 BNX10 BNX20	H
				BN500	K (FC/FCD)
(C)	SUMIBORON with special ceramic coating. The CBN and coating exhibit the hardness, toughness, thermal resistance and oxidation resistance that tool material requires for excellent cutting performance.		 Special ceramic coating CBN	New BNC2105 BNC2115 BNC2125 BNC2010 BNC2020 BNC300 BNC100 BNC160 BNC200	H
				BNC500	K (FCD)
(D)	Containing no binder but a structure of directly bonded nano- to sub-micron CBN particles which provides excellent hardness and thermal conductivity, making them highly efficient with long tool life when machining exotic alloys such as titanium alloys and cobalt-chrome alloys.		 CBN grain (no binder)	NCB100	K (FC) S Cemented Carbide Hard Brittle Material

K Cast Iron S Exotic Alloy H Hardened Steel Sintered Alloy Sintered Alloy Cemented Carbide Cemented Carbide Hard Brittle Material Hard Brittle Material

Coated SUMIBORON series



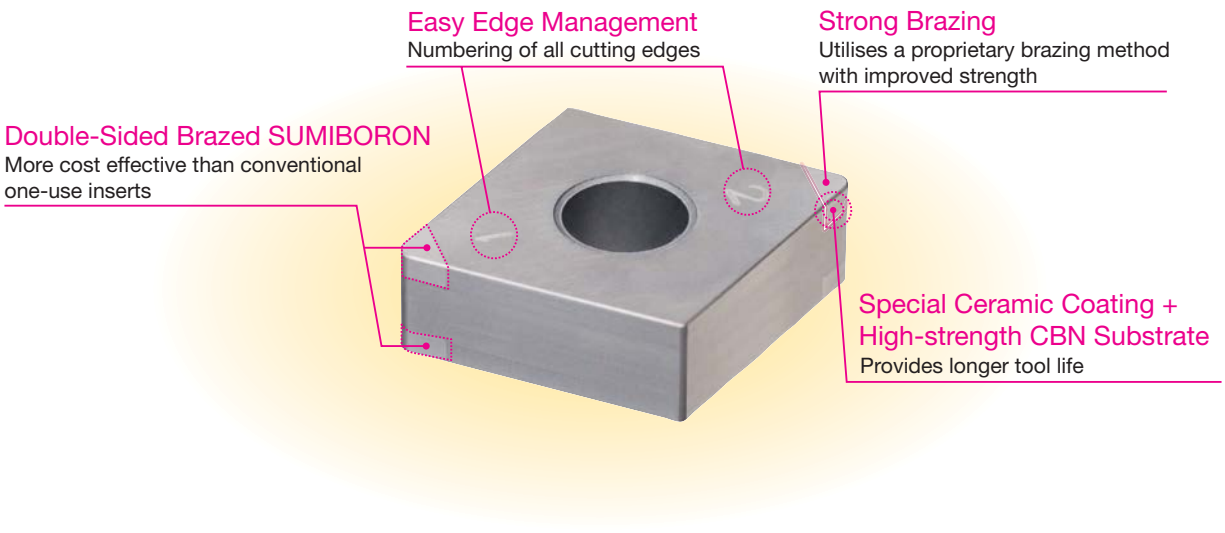
Achieves higher speed, higher efficiency and higher precision
Coated SUMIBORON series

■ General Features

With a highly thermal-resistant and tough CBN substrate coupled with a special ceramic coating, this series caters to a wide variety of applications, with improved precision and longer tool life compared to conventional CBN.

Our extensive range, including more cost-effective, double-sided, multi-cornered one-use inserts, offers a selection of economical and easy-to-use tools.

■ Features



■ Cutting Edge Management

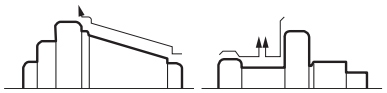
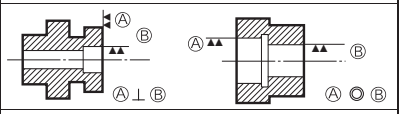
The edge numbers are still visible after machining, which makes the management of used cutting edges easy.

Grade Guidance H Hardened Steel

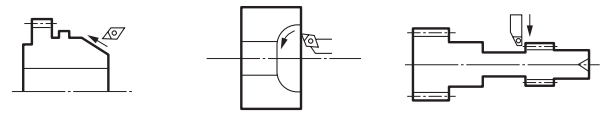
HARDENED STEEL MACHINING

● Advantages of machining hardened steel with SUMIBORON

Below is an analysis of the use of CBN tools compared to grinding. In addition to much lower investment in terms of machine cost and overhead cost due to the fact that a CNC lathe is cheaper than a grinding machine, in terms of surface finish quality, inserts can machine different profiles with the workpiece finishing equivalent to grinding. The chips from the turning process can also be collected and recycled to mitigate the environmental impact of sludge treatment for grinding. The workpieces shown at the bottom right of the table are shapes which will particularly benefit from cutting as opposed to grinding.

	Advantages	Remarks
Cost	Facility investment is low	· Cheaper machines · Reduced processes · Improved machining efficiency with less machining required
	Complex finishing in a single set-up	
Quality	Improved precision	
Environment	Environmentally-friendly	Sludge management → Chip control (Recyclable)

Machining Versatility with CBN



Taper Machining | Internal (Profile) Boring | Grooving/Profiling

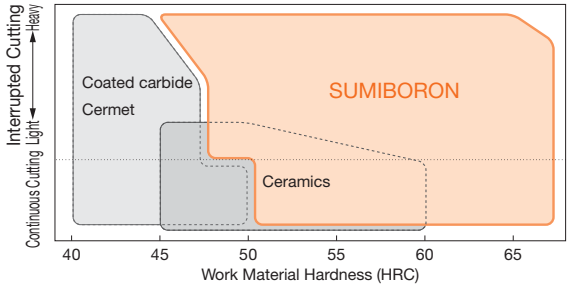
Recommended Grades

Grade	Binder	CBN Content (%)	Grain Size (μm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (μm)	Features
Coated								
NEW BNC2105	TiCN	45 to 50	3	30 to 32	1.1 to 1.2	TiAlN Super Multi-Layered Coating	3	Grade with excellent wear resistant coating and a CBN substrate ideal for high-speed finishing applications.
BNC2115	TiN	60 to 65	3	31 to 33	1.3 to 1.4	TiAlSiN Super Multi-layered Coating	3	Utilizing a coating with exceptional notch wear resistance and a tough CBN substrate to achieve stable and excellent surface finish.
BNC2125	TiN	65 to 70	4	33 to 35	1.5 to 1.6	TiAlBN Super Multi-layered Coating	3	Combination of a tough CBN substrate and a coating that has a balance of wear resistance and toughness, to achieve even more stable machining.
BNC2010	TiCN	50 to 55	2	30 to 32	1.1 to 1.2	TiCN Multi-layered Coating	2	Improved wear resistance from coating and substrate, achieves excellent and consistent surface roughness.
BNC2020	TiN	70 to 75	5	34 to 36	1.4 to 1.5	TiAlN Multi-layered Coating	2	Utilising a tough substrate along with a highly wear-resistant and adhesive coating layer, to achieve long tool life in general-purpose to high-efficiency machining.
BNC300	TiN	60 to 65	1	33 to 35	1.5 to 1.6	TiAlN	1	Suitable for finishing work materials combining continuous and interrupted cutting.
BNC100	TiN	40 to 45	1	29 to 32	1.0 to 1.1	TiAlN/TiCN	3	Suitable for high-speed finishing thanks to highly wear-resistant coating.
BNC160	TiN	60 to 65	3	31 to 33	1.2 to 1.3	TiAlN/TiCN	3	Achieves stable, high-precision finishing of hardened steel.
BNC200	TiN	65 to 70	4	33 to 35	1.4 to 1.5	TiAlN	3	A tough CBN substrate and a coating with high wear resistance provide a long tool life.
BNC8115	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	TiAlN	2	Grade with 100% solid CBN structure using PVD coating with excellent wear resistance to enable roughing operations.
Uncoated								
BN1000	TiCN	40 to 45	1	27 to 31	0.9 to 1.0	-	-	Achieves ultimate wear and fracture resistance. Suitable for high-speed cutting.
BN2000	TiN	50 to 55	2	31 to 34	1.1 to 1.2	-	-	General-purpose grade for hardened steel machining with a high degree of fracture and wear resistance.
BNX20	TiN	55 to 60	3	31 to 33	1.0 to 1.1	-	-	Achieves excellent crater wear resistance. Suitable for high-efficiency cutting under high-temperature conditions.
BN350	TiN	60 to 65	1	33 to 35	1.5 to 1.6	-	-	Achieves ultimate cutting edge strength. Suitable for heavy interrupted cutting.
BNX10	TiCN	40 to 45	3	27 to 31	0.9 to 1.0	-	-	Excellent wear resistance. Suited for high-speed continuous machining.

TRS measured with test piece equivalent to the insert's CBN layer.

Recommended Range

● Work Material Hardness and Recommended Range for SUMIBORON



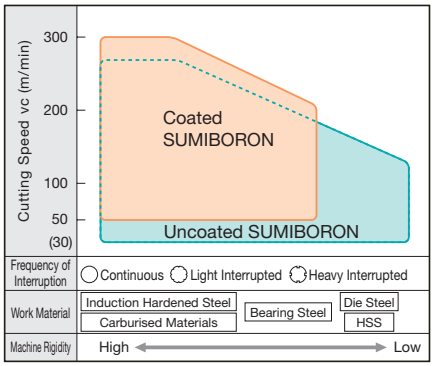
Grade Guidance H

Applications

Coated SUMIBORON: 1st recommendation for hardened steel machining, excellent performance in high-speed, high-efficiency machining.

Uncoated SUMIBORON: Ideal for machining small parts and hardened steel where cutting speed is limited.

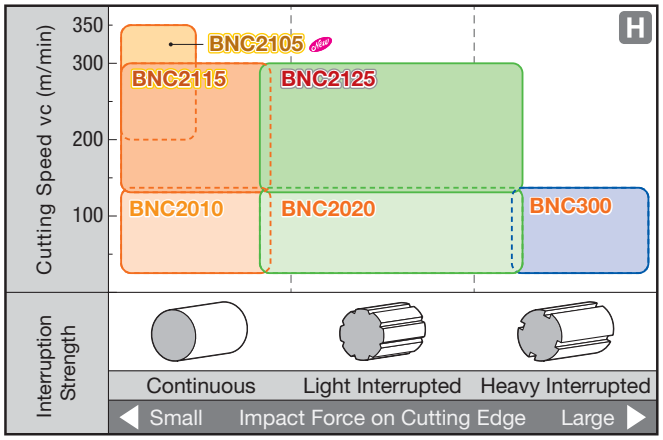
Series	Applications
Coated SUMIBORON	· First recommendation for hardened steel machining · Machining requiring high speed and high accuracy · Machining requiring high efficiency, such as carburised layer removal
Uncoated SUMIBORON	· Machining where cutting speed cannot be increased, such as small product machining · Machining of workpieces containing hard particles such as mold components · Machining with low tool rigidity



Application Range

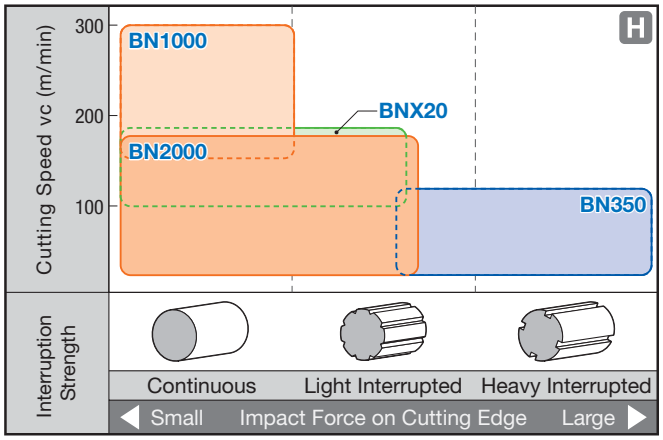
● Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

Coated SUMIBORON



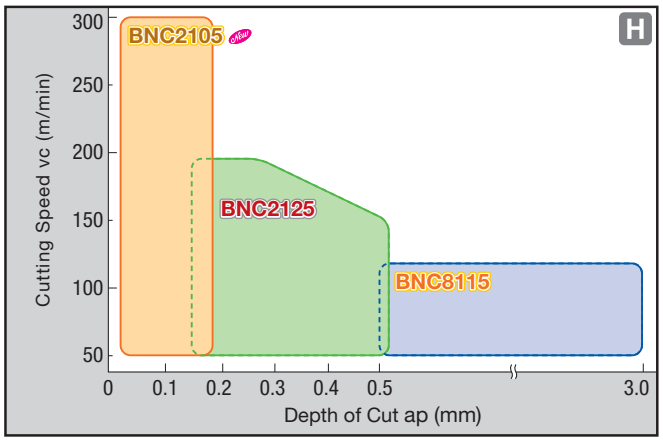
● Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

Uncoated SUMIBORON



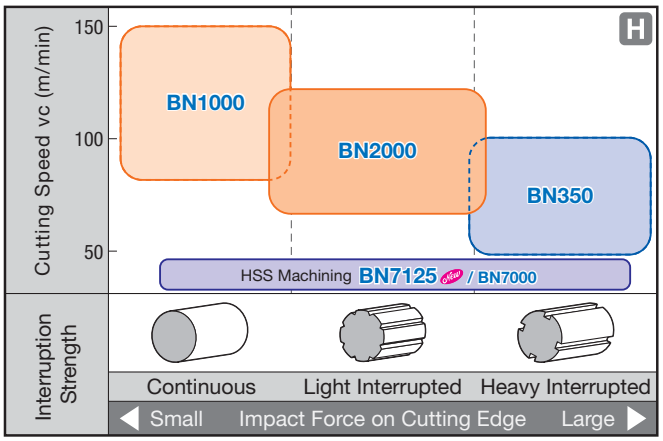
● Bearing Steel (SUJ2, etc.)

Coated SUMIBORON



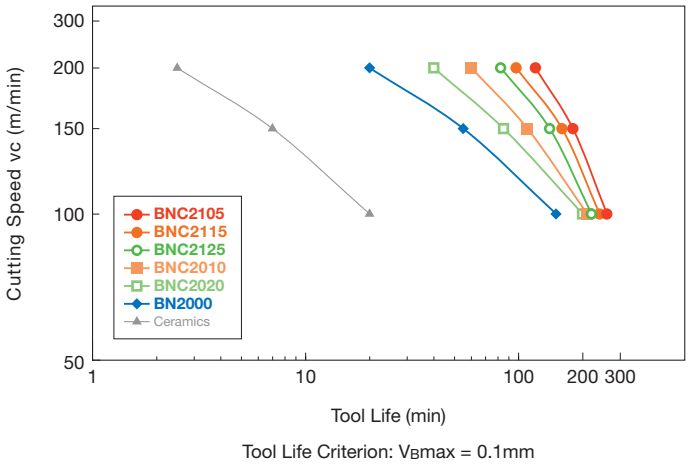
● Die Steel (SKD11/SKD61, etc.), HSS

Uncoated SUMIBORON



Grade Guidance H

Cutting Performance (Continuous Cutting)

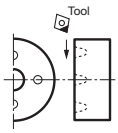


Tool Life Criterion: V_{Bmax} = 0.1mm

Work Material	: SCM415H (58-62HRC)
Tool Cat. No.	: DNGA150408
Cutting Conditions	: f = 0.1mm/rev, ap = 0.2mm Wet

Cutting Performance (Interrupted Cutting)

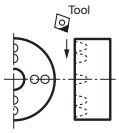
[Light Int. - Chamfered 4-Holed Face (Interrupted Cutting 25%)]



Tool Grade	Tool Life Ratio 50 100
BN2000	
BNC300	
BN350	

Work Material	: SCr420H (58 to 62 HRC)
Tool Cat. No.	: CNGA120408
Cutting Conditions	: vc = 100m/min, f = 0.1mm/rev, ap = 0.2mm, Dry

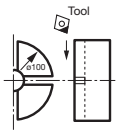
[Medium Int. - Chamfered 8-Holed Face (Interrupted Cutting 50%)]



Tool Grade	Tool Life Ratio 50 100
BN2000	
BNC300	
BN350	

Work Material	: SCr420H (58 to 62 HRC)
Tool Cat. No.	: CNGA120408
Cutting Conditions	: vc = 100m/min, f = 0.1mm/rev, ap = 0.2mm, Dry

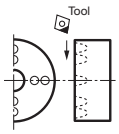
[Heavy Int. - U-Grooved Face (Interrupted Cutting 100%)]



Tool Grade	Tool Life Ratio 50 100
BN2000	
BNC300	
BN350	

Work Material	: SCr420H (58 to 62 HRC)
Tool Cat. No.	: CNGA120408
Cutting Conditions	: vc = 100m/min, f = 0.1mm/rev, ap = 0.2mm, Dry

[High Speed Int. - Chamfered 8-Holed Face (Interrupted Cutting 50%)]



Tool Grade	Tool Life Ratio 50 100
BN2000	
BNC300	
BN350	

Work Material	: SCr420H (58 to 62 HRC)
Tool Cat. No.	: CNGA120408
Cutting Conditions	: vc = 200m/min, f = 0.1mm/rev, ap = 0.2mm, Dry

Grade Guidance K Cast Iron

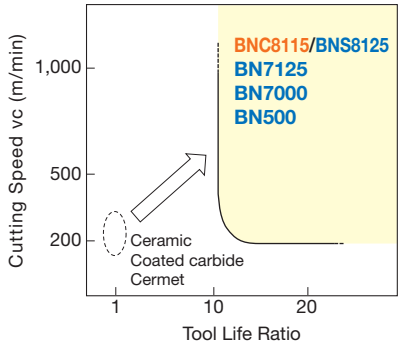
CAST IRON MACHINING

● Advantages of machining cast iron with SUMIBORON

Compared with conventional tools, a longer tool life for high speed machining is realized, machining efficiency is improved and better wear resistance, a sharper edge, excellent surface roughness and dimensional tolerance are achieved.
SUMIBORON is ideal for finishing of gray cast iron and special cast iron through FCD (ductile cast iron) and heat-treated high-grade cast iron such as ADI.

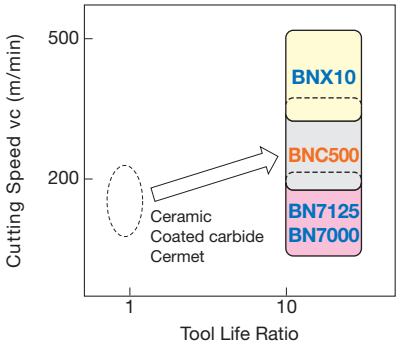
High-speed Machining

● Gray Cast Iron

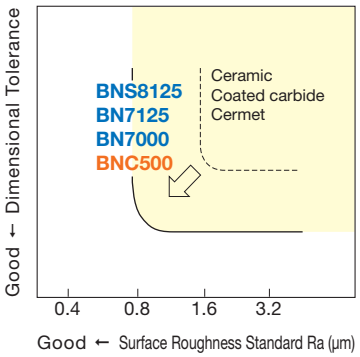


High-speed Machining

● Ductile Cast Iron



High-precision Machining



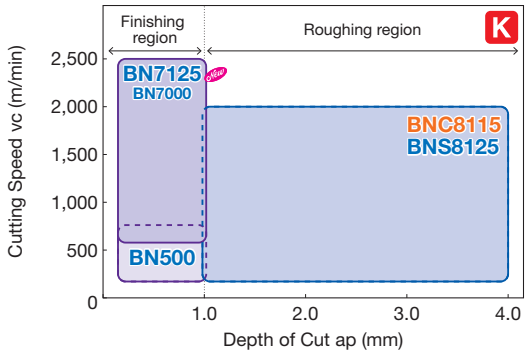
Recommended Grades

	Grade	Binder	CBN Content (%)	Grain Size (μm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (μm)	Features
Uncoated	BNS8125	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	-	-	Grade with 100% solid CBN structure that exhibits excellent wear and fracture resistance.
Uncoated	New BN7125	Co Compound	90 to 95	2	41 to 44	1.9 to 2.0	-	-	General-purpose grade with excellent wear resistance, fracture resistance, and thermal shock resistance, suitable for machining of cast iron and exotic alloys.
Uncoated	BN7000	Co Compound	90 to 95	2	41 to 44	1.8 to 1.9	-	-	Grade exhibiting wear and fracture resistance in cutting of cast iron and exotic alloys.
Uncoated	BN500	TiC	65 to 70	6	32 to 34	1.0 to 1.1	-	-	Grade optimised for cast iron cutting. Provides superior wear and fracture resistance.
Coated	BNC8115	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.15	TiAlN	2	Grade with 100% solid CBN structure, using PVD coating with excellent wear resistance to enable roughing operations.
Coated	BNC500 (For Ductile Cast Iron)	TiC	60 to 65	4	32 to 34	1.1 to 1.2	TiAlN	3	Suitable for machining of hard-to-cut cast iron, thanks to the highly wear-resistant substrate and coating.

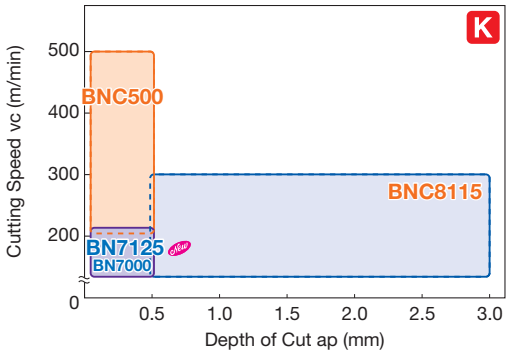
TRS measured with test piece equivalent to the insert's CBN layer.
Refer to pages L9 to L11 for machining of sintered components, rolls, hard facing alloys, hardened stainless steel, titanium alloys, and heat-resistant alloys.

Application Range

● Gray Cast Iron



● Ductile Cast Iron



● Special Cast Iron

Work Material	Hardness (HB)	Work Material Structure	Examples	Cutting Speed vc (m/min) 100 200 300 350 400 500
Ni-resistant Cast Iron	150 to 200	Austenite	Piston ring	BNC500
High-Cr Cast Iron	250 to 350	Austenite	Pump component	BNS8125
FCV (CGI)	400 to 580	Pearlite	Engine blocks Cylinder heads Brake discs	BNC500

Grade Guidance K Cast Iron

Recommended Cutting Conditions

● Turning

Work Material		Recommended Grades	Recommended Cutting Conditions		
Material	Standard (Hardness)		Cutting Speed vc (m/min) 100 – 1,000 – 2,000	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Gray Cast Iron	FC200 to FC300 (HB ≤ 230)	BN7125 / BN7000	500 – 2,000	0.1 to 0.5	≤ 1.0
		BNC8115 / BNS8125	200 – 2,000	0.1 to 1.0	≤ 4.0
		BN500	200 – 700	0.1 to 0.5	≤ 1.0
Alloy Cast Iron	(HB ≥ 200)	BN7125 / BN7000	200 – 800	0.1 to 0.4	≤ 0.5
		BNS8125	200 – 1,000	0.1 to 0.8	≤ 2.0
Ductile Cast Iron	FCD450 to FCD550	BNC8115	80 – 300	0.1 to 0.5	≤ 3.0
		BN7125 / BN7000	80 – 200	0.1 to 0.4	≤ 0.6
		BNC500	150 – 500	0.1 to 0.4	≤ 0.5
	FCD600 to FCD700	BNC500	200 – 400	0.1 to 0.4	≤ 0.5
Vermicular Cast Iron FCV(CGI)	—	BNC500	200 – 500	0.1 to 0.4	≤ 0.4

Cutting Oil: Wet cut (BNC8115/BNS8125 can also be used dry)

● Milling

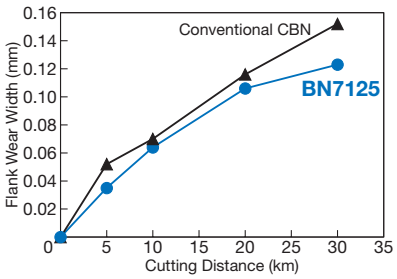
Work Material		Recommended Grades	Recommended Cutting Conditions		
Material	Standard (Hardness)		Cutting Speed vc (m/min) 100 – 1,000 – 2,000	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Gray Cast Iron	FC200 to FC300 (HB ≤ 200)	BN7125 / BN7000	800 – 2,000	0.1 to 0.5	≤ 0.5
		BNS8125	800 – 2,000	0.1 to 1.0	≤ 4.0

Cutting Oil: Dry cut

Cutting Performance

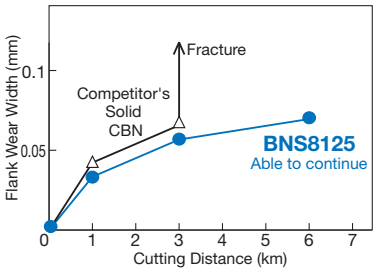
Gray Cast Iron Turning — Recommended Grades: BN7125/BN7000/BNC8115/BNS8125/BN500

● High Speed Continuous Cutting



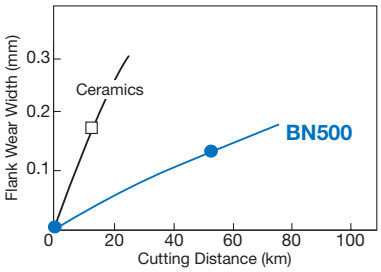
Work Material : FC300 (Pearlite)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions : vc = 800m/min, f = 0.15mm/rev
ap = 0.2mm Wet

● Interrupted Cutting



Work Material : FC300 (Pearlite)
Tool Cat. No. : SNGN090308
Cutting Conditions : vc = 600m/min, f = 0.3mm/rev
ap = 0.5mm Dry

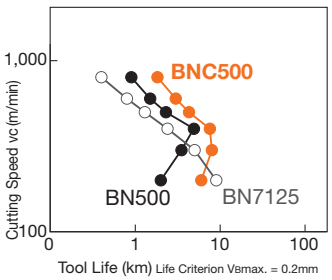
● Continuous Cutting



Work Material : FC300 (Pearlite)
Tool Cat. No. : SNGN120412
Cutting Conditions : vc = 500m/min, f = 0.3mm/rev
ap = 0.15mm Wet

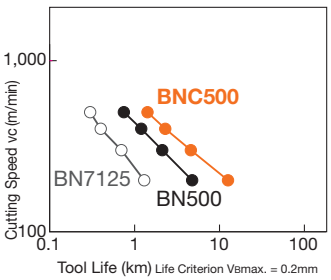
Ductile Cast Iron Turning — Recommended Grades: BNC500

● FCD450



Work Material : FCD450 (Continuous Cutting)
Cutting Conditions : f = 0.2mm/rev, ap = 0.2mm Wet

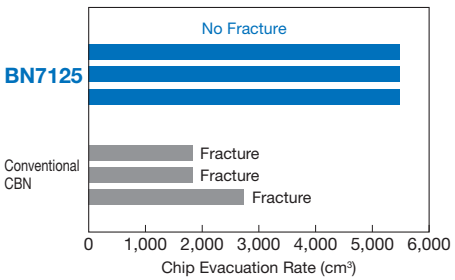
● FCD700



Work Material : FCD700 (Continuous Cutting)
Cutting Conditions : f = 0.2mm/rev, ap = 0.2mm Wet

Gray Cast Iron Milling — Recommended Grades: BNC8115/BNS8125 BN7125/BN7000

● Cast Iron



Work Material : FC250 (Pearlite)
Tool Cat. No. : FMU4100R SNEW1203ADTR
Cutting Conditions : vc = 1,500m/min, fz = 0.13mm/t, ap = 0.3mm, Wet

Grade Guidance Sintered Alloy

SINTERED COMPONENT MACHINING

● Advantages of machining sintered components with SUMIBORON

SUMIBORON, with its excellent wear resistance and cutting edge integrity, suffers less cutting edge wear than cemented carbide or cermet, thereby suppressing burrs and chipping on the workpiece to achieve good machining precision and surface finish.

Sintered Components

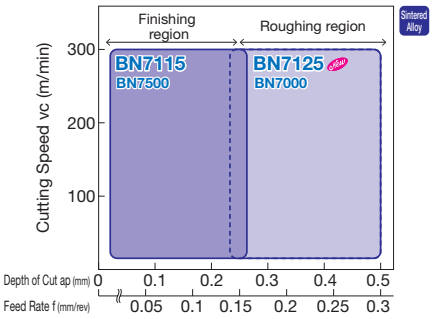
Recommended Grades

Grade	Binder	CBN Content (%)	Grain Size (µm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (µm)	Features
BN7115	Co Compound	90 to 95	1	41 to 44	2.2 to 2.3	-	-	Grade balancing ultimate cutting edge sharpness with fracture resistance, suitable for finishing of sintered alloy.
BN7500	Co Compound	90 to 95	1	41 to 44	2.0 to 2.1	-	-	Grade maintaining good cutting edge sharpness, suitable for finishing of sintered alloy.
New BN7125	Co Compound	90 to 95	2	41 to 44	1.9 to 2.0	-	-	Grade balancing ultimate fracture resistance with wear resistance, suitable for roughing of sintered alloy.
BN7000	Co Compound	90 to 95	2	41 to 44	1.8 to 1.9	-	-	Grade exhibiting improved wear and fracture resistance in roughing of sintered alloy.

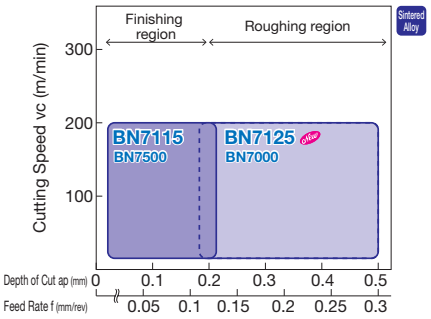
TRS measured with test piece equivalent to the insert's CBN layer.

Application Range

● General Sintered Alloy (50 to 90HRB)

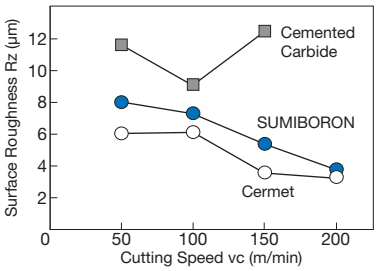


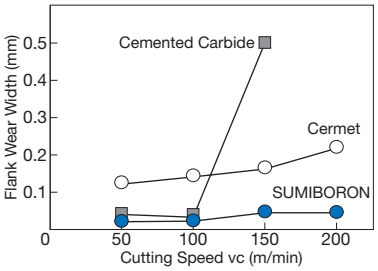
● High-density/Sintered Alloy (30 to 65 HRC)

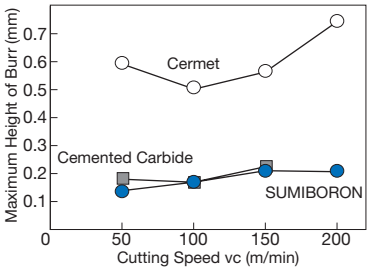


Cutting Performance

● Grade Performance Comparison







Work Material	: Sintered Alloy F-08C2 equivalent
Machining Details	: ø80-ø100 heavy interrupted facing with grooves and drilled holes (after 40 passes)
Tool Cat. No.	: TNGA160404
Cutting Conditions	: f = 0.1mm/rev, ap = 0.1mm Wet

For general sintered alloy, cemented carbide and cermet grades can perform up to vc = 100m/min. However, around vc = 120m/min, wear becomes rapid and surface roughness deteriorates with increased burrs. On the other hand, SUMIBORON exhibits stability and superior wear resistance, burr prevention and surface roughness, especially at high speeds.

Valve Seat Ring (VSR)

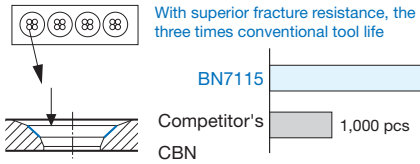
*VSR has both (Intake: IN) and (Exhaust: EX) with the exhaust generally being hardened.

Recommended Cutting Conditions

Grade	Work Material Hardness (HV)	Recommended Cutting Conditions Cutting Speed vc (m/min) 20 40 60 80 100 120 140	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
BN7115	< 300		0.03 to 0.2	0.05 to 0.5
BN350	≥ 300		0.03 to 0.2	0.05 to 0.5

Application Examples

With superior fracture resistance, the BN7115 can achieve three times conventional tool life



Work Material	: Sintered Alloy
Tool Cat. No.	: 3NU-TPGW110308LF
Cutting Conditions	: vc = 120m/min, f = 0.08mm/rev Wet

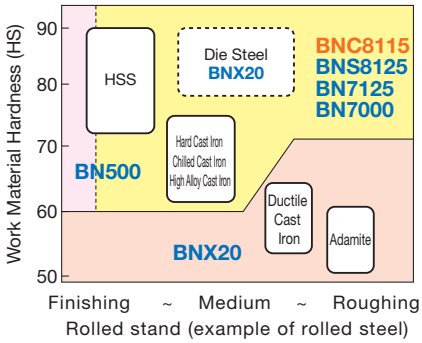
Grade Guidance H Hardened Steel K Cast Iron S Exotic Alloy

Roll Machining

● Advantages of machining rolls with SUMIBORON

SUMIBORON enables the machining of high-hardness rolls that were previously difficult to machine with conventional tools, drastically improving machining efficiency.

Recommended Grades



Recommended Cutting Conditions

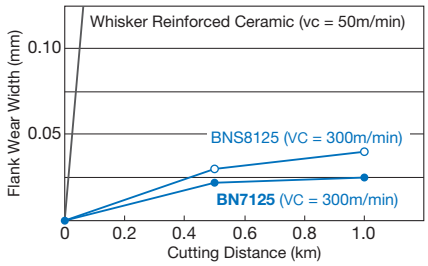
Work Material		Recommended Cutting Conditions		
Category	Hardness (HS)	Cutting Speed vc (m/min) 20 40 60 80 100 120 140	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Adamite	≥ 40		0.1 to 0.5	0.2 to 3.0
Chilled Cast Iron	≥ 60		0.1 to 0.5	0.2 to 3.0
High-alloy Cast Iron	≥ 60		0.1 to 0.5	0.2 to 3.0
HSS	≥ 70		0.1 to 0.4	0.1 to 3.0

Hard Facing Alloy Machining

● Advantages of machining hard facing alloy with SUMIBORON

SUMIBORON enables the machining of high-hardness facing alloys that were previously difficult to machine with conventional tools, drastically improving machining efficiency.
The first recommended grade is BN7125, followed by BNS8125.

Cutting Performance



Work Material : Colmonoy No.6 (NiCr-Based Self-Fluxing Alloy)
Tool Cat. No. : SNGN090308
Cutting Conditions : f = 0.1mm/rev, ap = 0.2mm Dry

Recommended Cutting Conditions

Work Material		Recommended Cutting Conditions		
Category	Material	Cutting Speed vc (m/min) 50 100 200 300	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Ni-Based Self-Fluxing Alloy	Colmonoy No.6		0.05 to 0.2	0.1 to 3.0
Co-Based Self-Fluxing Alloy	Stellite		0.05 to 0.2	0.1 to 1.0

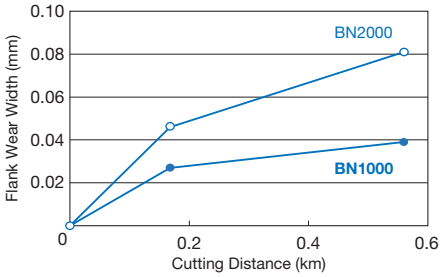
● BN7125 has a long tool life and minimal wear with high speed cutting

Hardened Stainless Steel Machining

● Advantages of machining hardened stainless steel with SUMIBORON

SUMIBORON enables the machining of hardened stainless steel, previously difficult to machine with conventional tools, drastically improving machining efficiency.
The first recommended grade is BN1000. When strength is required, we recommend BN2000.

Cutting Performance



Work Material : SUS440C (59 to 61HRC, continuous)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions : vc = 200m/min, f = 0.1mm/rev, ap = 0.1mm Wet

Recommended Cutting Conditions

Work Material	Recommended Cutting Conditions		
Category	Cutting Speed vc (m/min) 50 100 200 300	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Hardened Stainless Steel		0.03 to 0.2	0.03 to 0.3

Grade Guidance S Exotic Alloy

Titanium Alloy Machining

● Advantages of machining titanium alloy with SUMIBORON

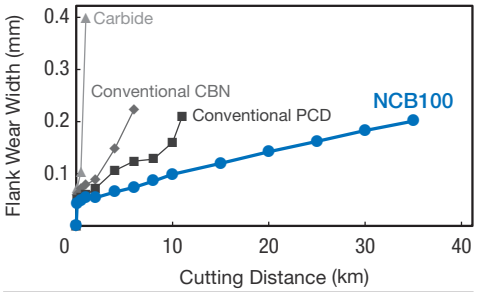
SUMIBORON enables high speed machining of titanium alloys that were previously difficult to machine with conventional tools, drastically improving machining efficiency.

Recommended Grades

Grade	Binder	CBN Content (%)	Grain Size (μm)	Hardness HV (GPa)	TRS (GPa)	Main Coating Components	Coating Thickness (μm)	Features
NCB100	—	100	Up to 0.5	51 to 54	1.8 to 1.9	—	—	Ideal for high-efficiency finishing of titanium alloy.

TRS measured with test piece equivalent to the insert's CBN layer.

Cutting Performance



Work Material : Titanium Alloy (Ti-6Al-4V)
Tool Cat. No. : CNGA120408
Cutting Conditions : VC = 150m/min, f = 0.15mm/rev, ap = 0.5mm
Wet (High Pressure Coolant)

Recommended Cutting Conditions

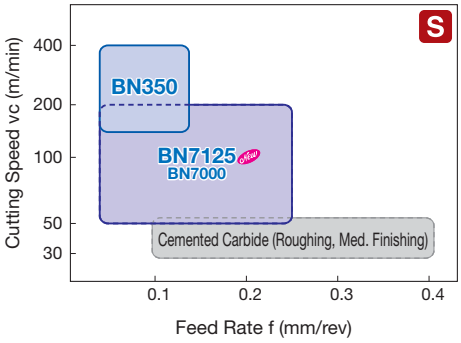
Work Material		Grade	Recommended Cutting Conditions [Min. - **Optimum** - Max.]		
Composition	Hardness (HRC)		Cutting Speed vc (m/min) 50 100 150 200 250 300	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Ti-6Al-4V	30 - 35	NCB100		0.05-**0.15**-0.20	0.10-**0.30**-0.50
Ti-5Al-5V-5Mo-3Cr	32 - 38	NCB100		0.05-**0.10**-0.20	0.10-**0.30**-0.50
Ti-10V-2Fe-3Al	32 - 38	NCB100		0.05-**0.10**-0.20	0.10-**0.30**-0.50

Heat-resistant Alloy Machining

● Advantages of machining heat-resistant alloy with SUMIBORON

SUMIBORON provides long tool life in the finishing of heat-resistant alloys.

Recommended Grades



SUMIBORON is best suited for finishing of heat-resistant alloy

Recommended Cutting Conditions

Work Material		Recommended Cutting Conditions		
Category	Material	Cutting Speed vc (m/min) 50 100 150 200	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Ni-based Heat-resistant Alloy	Inconel 718		0.05 to 0.2	0.1 to 1.0
Co-Based Heat-Resistant Alloy	Stellite		0.05 to 0.2	0.1 to 1.0

BNC2115/BNC2125/BNC2010/BNC2020

The Pinnacle of High Accuracy/High-efficiency Cutting

■ Features

Coated SUMIBORON, our first recommendation for hardened steel machining, improves productivity in all types of hardened steel machining applications.

- Ideal for high-speed/high-efficiency applications: BNC2115 / BNC2125
- Ideal for low-speed/low-rigidity applications: BNC2010 / BNC2020

VIDEO OF CUTTING BNC2115 / BNC2125

VIDEO OF CUTTING BNC2010 / BNC2020

■ Lineup

● BNC2115 · The ultimate in high-precision machining of hardened steel
Utilizing a thick coating with exceptional notch wear resistance and a tough CBN substrate to achieve stable and excellent surface finish.

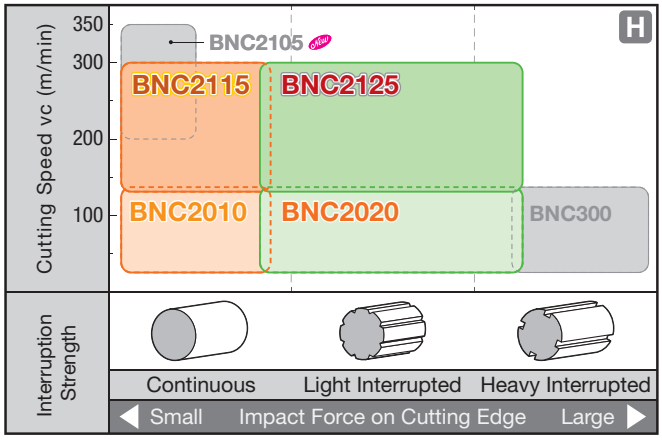
● BNC2125 · First recommendation for hardened steel machining
Combination of a tough CBN substrate and a thick coating that has a balance of wear resistance and toughness, to achieve stable machining in a wide range of applications.

● BNC2010 · High-precision grade for low- to medium-speed machining
Excellent wear resistant CBN substrate and coating layer, for high-precision machining that requires surface roughness and surface finish accuracy.

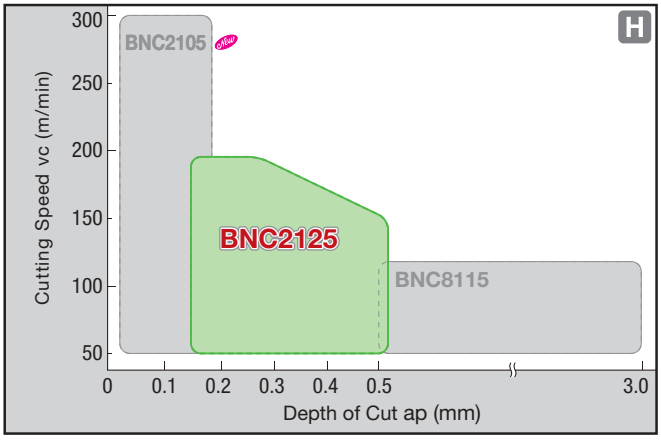
● BNC2020 · General-purpose grade for low- to medium-speed machining
Utilizing an especially high wear resistant coating and a tough CBN substrate. Excellent machining stability in low-rigidity situations and high-load cutting

■ Application Range

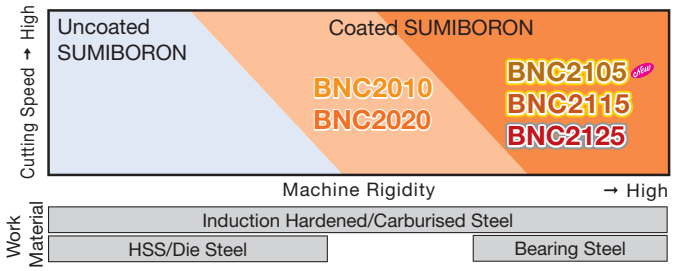
● Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

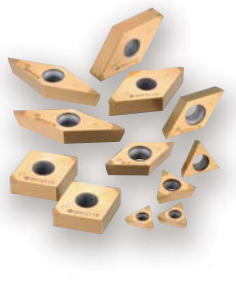


● Bearing Steel (SUJ2, etc.)



■ Differentiation

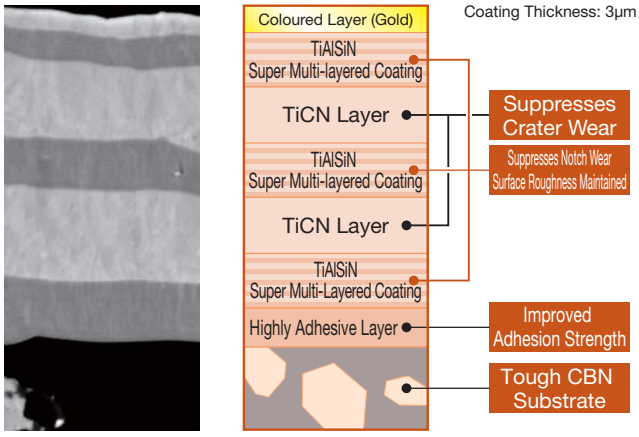




BNC2115/BNC2125/BNC2010/BNC2020

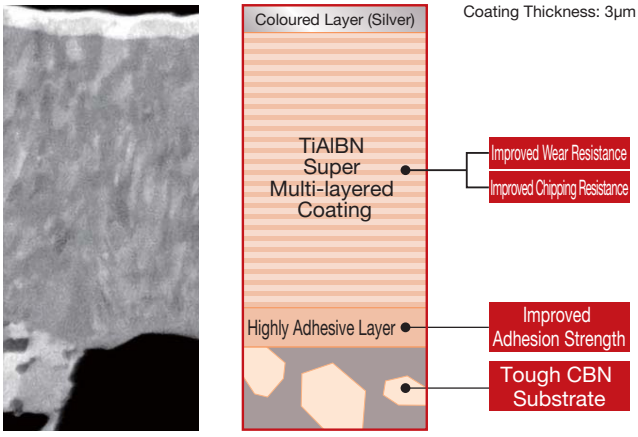
■ CBN Substrate and Coating Structure

BNC2115 High-precision Machining (Medium- to High-speed)



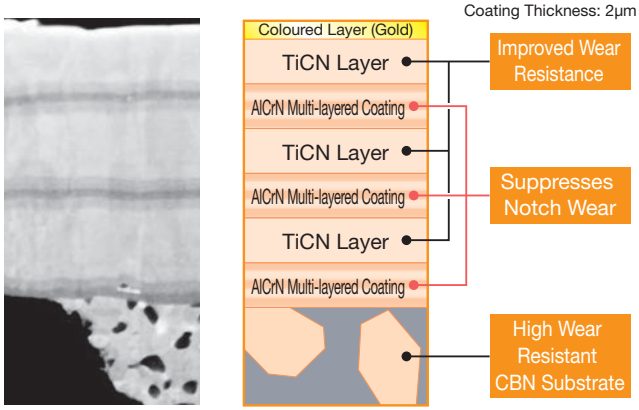
Thick layers of high-strength TiAlSiN super multi-layered coating and highly heat-resistant TiCN coating are applied to a tough substrate to realise excellent surface finish quality

BNC2125 General-purpose Machining (Medium- to High-speed)



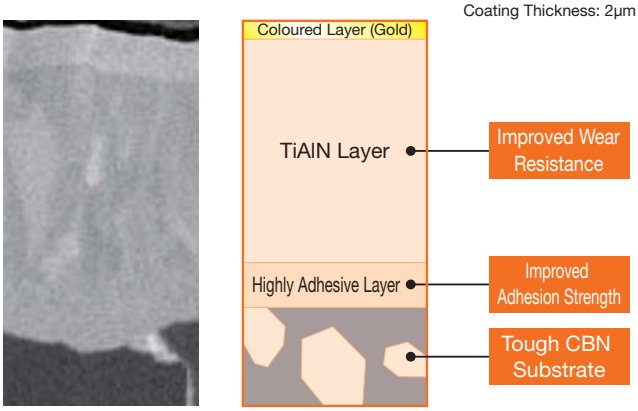
Thick layer of super multi-layered ultra-fine TiAlBN coating with high strength and high hardness coupled with a tough substrate achieve high performance on a wide range of applications

BNC2010 High-precision Machining (Low- to Medium-speed)



Stacked high-strength AlCrN multi-layered coating and highly heat-resistant TiCN coating are applied to a highly wear-resistant substrate to maintain excellent surface finish quality

BNC2020 General-purpose Machining (Low- to Medium-speed, Unstable Cutting)



Application of highly wear resistant TiAlN coating to a tough substrate dramatically improves machining stability in low-rigidity setups and high-load cutting

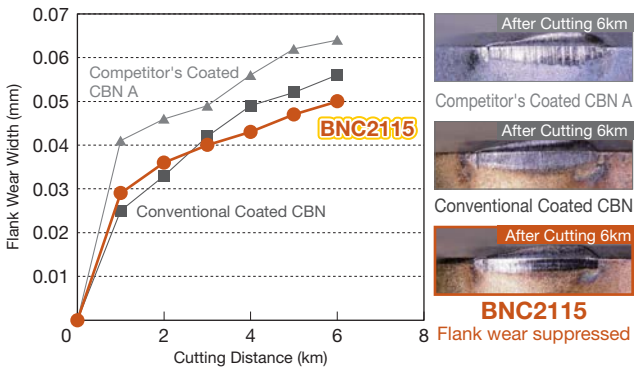
■ Recommended Cutting Conditions

Grade	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate f (mm/rev) Min. - **Optimum** - Max.	Depth of Cut ap (mm) Min. - **Optimum** - Max.
BNC2115	110- **180** -300	0.03- **0.10** -0.20	0.03-**0.20**-0.35
BNC2125	110- **160** -300	0.05- **0.20** -0.40	0.05-**0.30**-0.50
BNC2010	50- **140** -180	0.03- **0.10** -0.20	0.03-**0.20**-0.35
BNC2020	50- **120** -180	0.03- **0.20** -0.40	0.05-**0.30**-0.50
BNC300	50- **100** -150	0.03- **0.10** -0.20	0.03-**0.20**-0.30

BNC2115/BNC2125/BNC2010/BNC2020

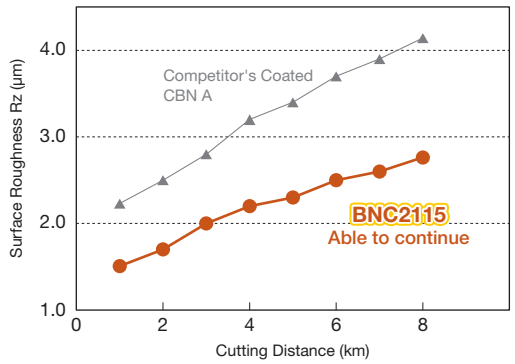
■ Cutting Performance

● BNC2115 Continuous Cutting (Wear Resistance)



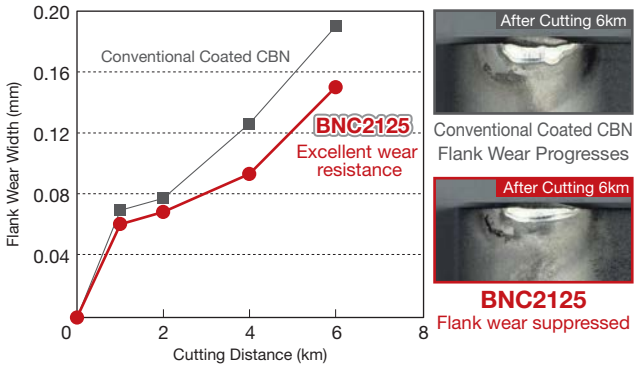
Work Material	: SCM415H (58 to 62HRC)
Tool Cat. No.	: 4NC-DNGA150408
Cutting Conditions	: vc = 200m/min, f = 0.1mm/rev, ap = 0.15mm Wet

● BNC2115 Continuous Cutting (Machined Surface Roughness)



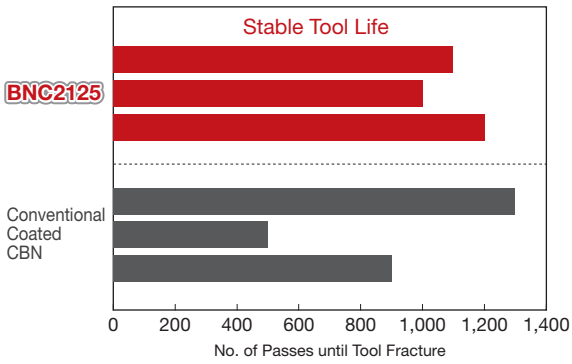
Work Material	: SCM415H (58 to 62HRC)
Tool Cat. No.	: 4NC-DNGA150408
Cutting Conditions	: vc = 200m/min, f = 0.1mm/rev, ap = 0.15mm Wet

● BNC2125 Continuous Cutting (Wear Resistance)



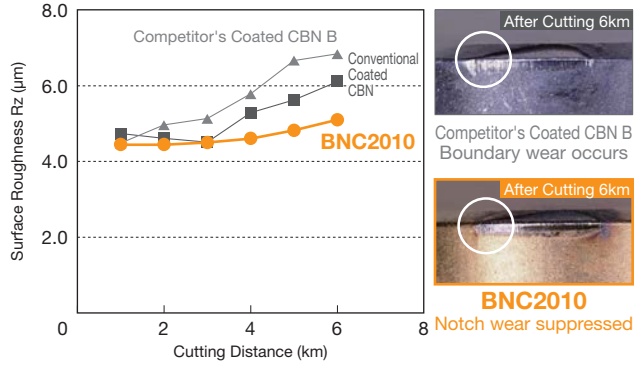
Work Material	: SUJ2 (58 to 62HRC)
Tool Cat. No.	: 4NC-DNGA150408
Cutting Conditions	: vc = 150m/min, f = 0.1mm/rev, ap = 0.2mm Wet

● BNC2125 High-load Cutting (Fracture Resistance)



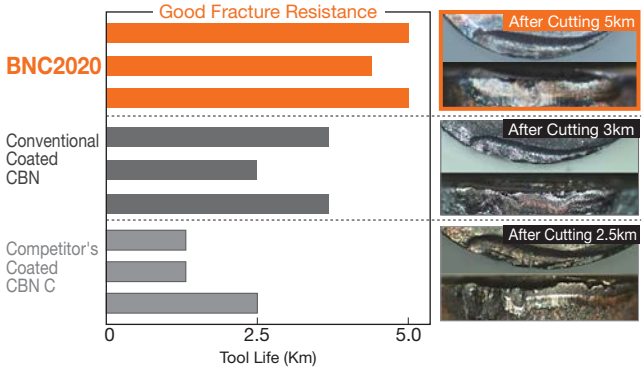
Work Material	: SUJ2 (58 to 62HRC)
Tool Cat. No.	: 4NC-DNGA150408
Cutting Conditions	: vc = 150m/min, f = 0.15mm/rev, ap = 0.5mm, 63m/times Wet

● BNC2010 Continuous Cutting (Machined Surface Roughness)



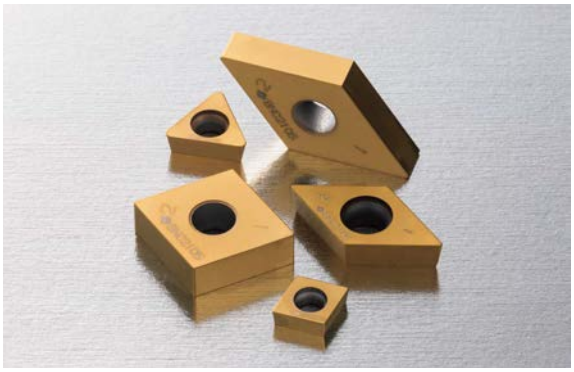
Work Material	: SCM415H (58 to 62HRC)
Tool Cat. No.	: 4NC-DNGA150408
Cutting Conditions	: vc = 120m/min, f = 0.14mm/rev, ap = 0.15mm Wet

● BNC2020 Interrupted Cutting (Fracture Resistance)



Work Material	: SCM415H with 5 grooves (58 to 62HRC)
Tool Cat. No.	: 4NC-CNGA120412
Cutting Conditions	: vc=130m/min, f =0.1mm/rev, ap=0.6mm Dry

BNC2105 H



The definitive grade in high-speed, high-accuracy machining

■ Features

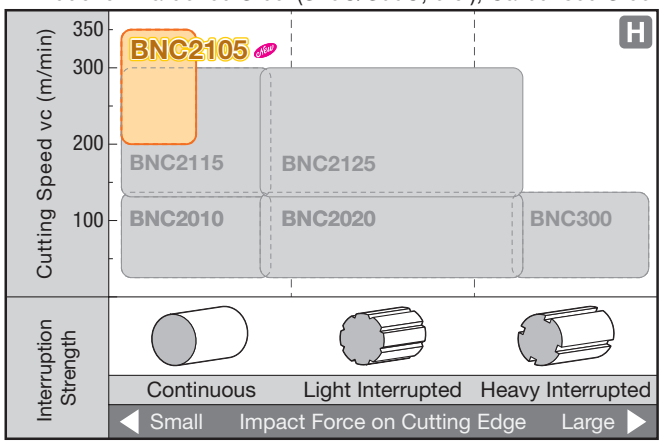
BNC2105 is the latest addition to the lineup, realising even higher-speed machining with Coated SUMIBORON, our first recommendation for hardened steel.

● BNC2105 New

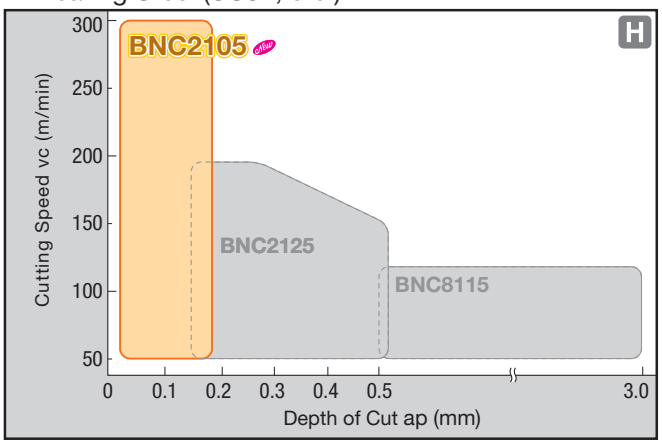
· Realises outstanding wear resistance in high-speed machining of hardened steel
Excellent wear resistant coating and CBN substrate, achieve stable and long tool life in high-speed machining.

■ Application Range

● Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

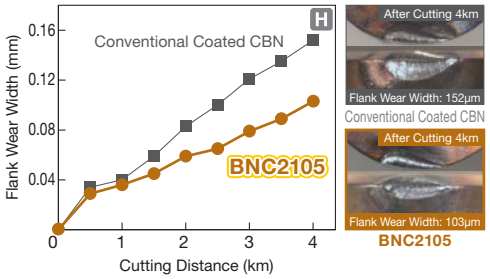


● Bearing Steel (SUJ2, etc.)

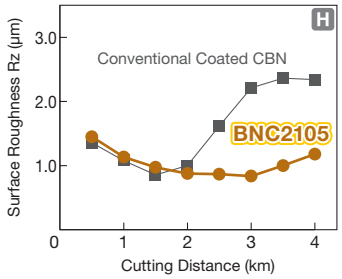


■ Cutting Performance

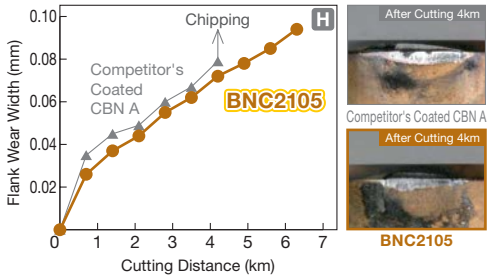
● Wear Resistance (Bearing Steel)



● Machined Surface Roughness (Bearing Steel)



● Wear Resistance (Carburised Steel)



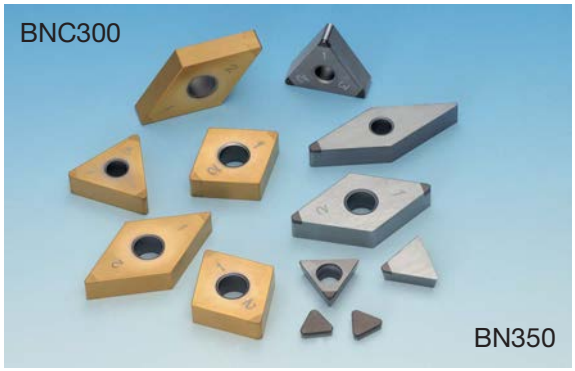
Work Material	: SUJ2 (58 to 62HRC)
Tool Cat. No.	: 4NC-DNGA150408
Cutting Conditions	: vc = 200m/min, f = 0.1mm/rev, ap = 0.1mm Wet

Work Material	: SCM415H (58 to 62HRC)
Tool Cat. No.	: 4NC-DNGA150408
Cutting Conditions	: vc = 250m/min, f = 0.06mm/rev ap = 0.1mm Wet

■ Recommended Cutting Conditions

Grade	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate f (mm/rev) Min. - **Optimum** - Max.	Depth of Cut ap (mm) Min. - **Optimum** - Max.
BNC2105	150- **200** -350	0.03- **0.10** -0.15	0.03-**0.15**-0.20

BNC300/BN350 H



The Ultimate in Interrupted Machining of Hardened Steel

■ Features

BNC300

A CBN substrate that emphasizes toughness is coupled with a highly wear-resistant TiAlN-based coating layer that has improved adhesion strength. With a good balance of fracture and wear resistance, this grade achieves a long, stable tool life in interrupted cutting or in a mixture of continuous and interrupted cutting.

BN350

SUMIBORON series' highest fracture resistance and toughest CBN. Reliable grade for achieving stable tool life in heavy interrupted cutting conditions.

■ Lineup

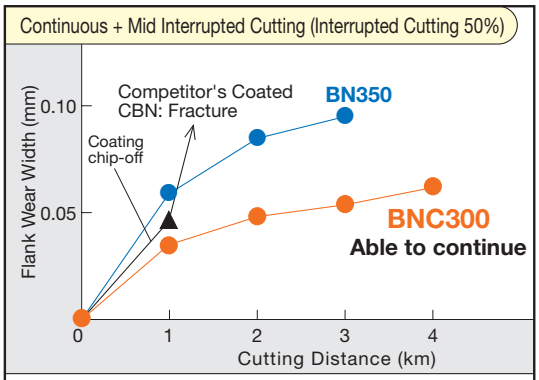
●BNC300

- Long, stable tool life in interrupted cutting
  Achieving long, stable tool life in heavy interrupted cutting, with superior fracture resistance.
- Superior dimensional accuracy
  TiAlN-based high wear resistance coating achieves superior dimensional accuracy even in interrupted cutting.
- Supports various work material shapes
  Achieves long, stable tool life even in workpieces requiring both continuous and interrupted cutting.

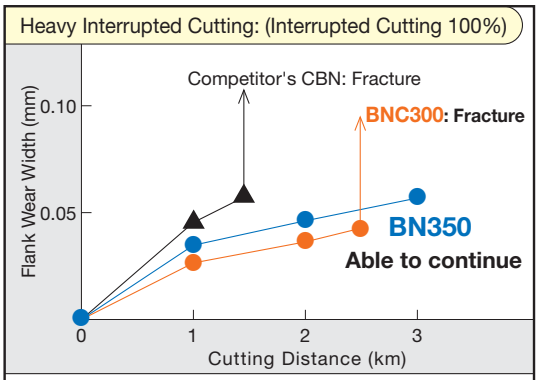
●BN350

- Superb stability with regard to fracture
  Superior fracture resistance, preventing the fractures that commonly occur during interrupted cutting. Achieves a long, stable tool life.

■ Cutting Performance



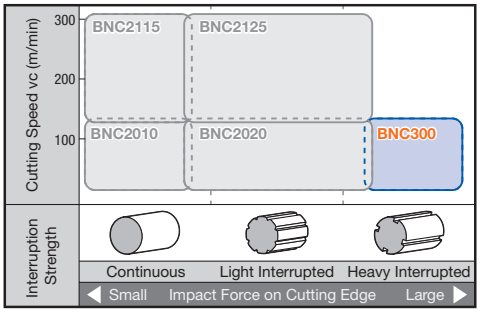
● **BNC300** has a superior balance of fracture and wear resistance.



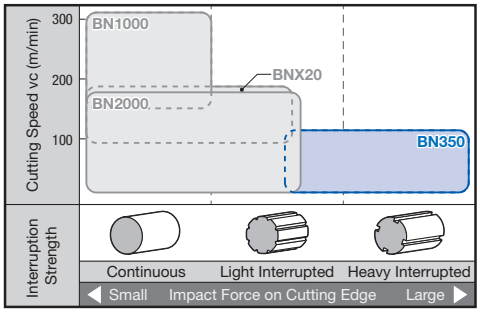
● **BN350** exhibits very good fracture resistance.

■ Application Range

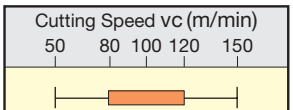
●Coated SUMIBORON



●SUMIBORON



■ Recommended Cutting Conditions (BNC300/BN350 common)

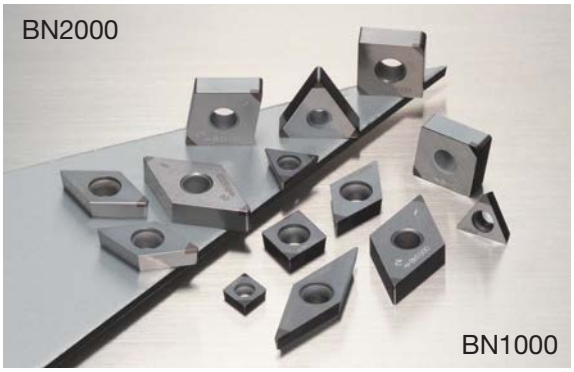


Feed Rate f (mm/rev)	Depth of Cut ap (mm)
0.03 to 0.20	0.03 to 0.30

Coolant: Dry

MEMO

BN1000/BN2000 H



■ Features

Uncoated SUMIBORON grades that utilize a newly developed high-purity ceramic binder.
Combines both fracture and wear resistance to achieve a stable tool life in a wide variety of hardened steel machining.
A wide selection of inserts are available, starting from a single-cornered type.

■ Lineup

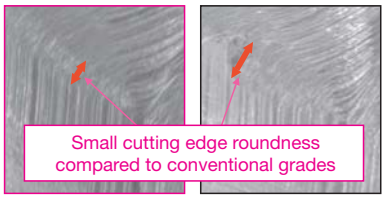
● BN1000

- SUMIBORON grade for high-speed machining with the best wear resistance Providing superior tool life in continuous cutting to light interrupted cutting.
- Improved fracture resistance while emphasizing wear resistance. Improved hardness and thermal resistance from the high-purity TiCN ceramic binder.

● BN2000

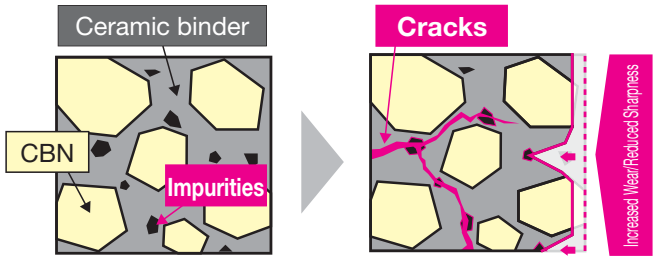
- General-purpose grade suitable for typical hardened steel machining applications. Provides stable tool life in continuous to light to medium interrupted machining.
- Has a high degree of both fracture and wear resistance. Significant improvements in the performance of both by employing a high-purity ceramic binder.
- Stable surface roughness achieved by increasing edge sharpness (right figure).

Sharpness Comparison



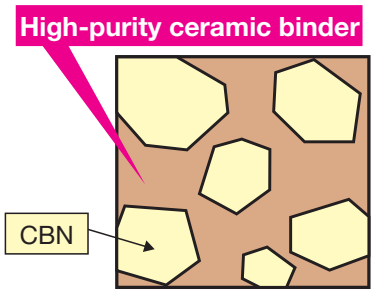
■ Newly Developed High-purity Ceramic Binder

Conventional Grade



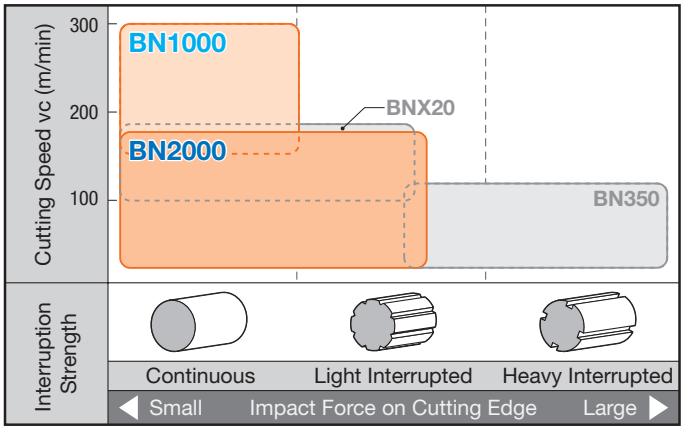
The impurities contained in the ceramic binder for conventional grades decrease the sintered body strength and thermal resistance, leading to cracks (fracture) and wear.

BN1000/BN2000



With a newly developed high-purity ceramic binder, BN1000/BN2000 achieve toughness and improved thermal resistance by decreasing impurities to an extreme.

■ Application Range



■ Recommended Cutting Conditions

● BN1000

Cutting Speed vc (m/min): 30 100 120 150 200 250 300

Feed Rate f (mm/rev)	Depth of Cut ap (mm)
0.03 to 0.15	0.03 to 0.2

● BN2000

Cutting Speed vc (m/min): 30 80 100 120 150 200 250 300

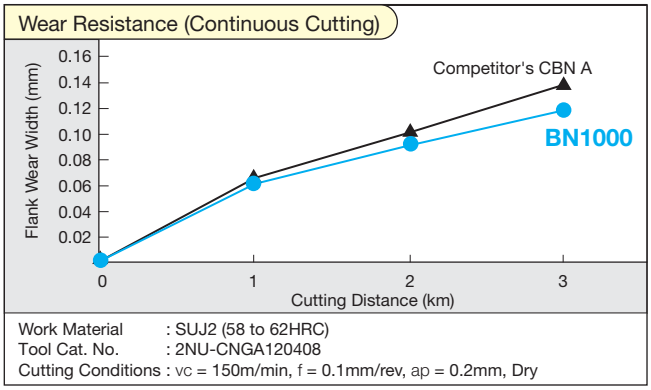
Feed Rate f (mm/rev)	Depth of Cut ap (mm)
0.03 to 0.2	0.03 to 0.3

Cutting Oil: Continuous Cutting Dry, Wet
Interrupted Cutting Dry

BN1000/BN2000 H Hardened Steel

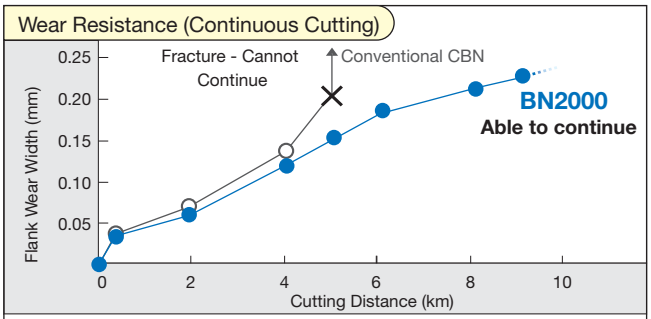
■ Cutting Performance

● BN1000



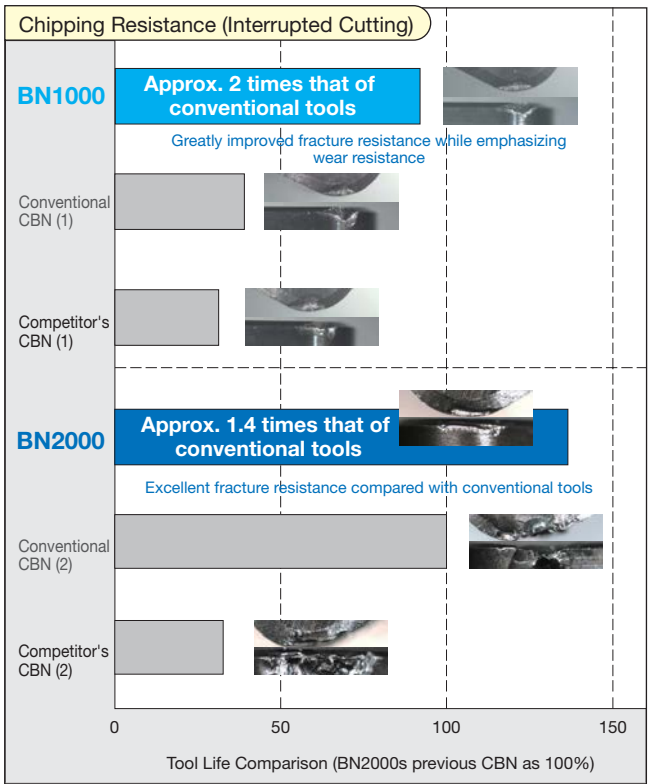
Work Material : SUJ2 (58 to 62HRC)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions : vc = 150m/min, f = 0.1mm/rev, ap = 0.2mm, Dry

● BN2000



Work Material : SCM415H (58 to 62HRC)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions : vc = 100m/min, f = 0.1mm/rev, ap = 0.2mm, Dry

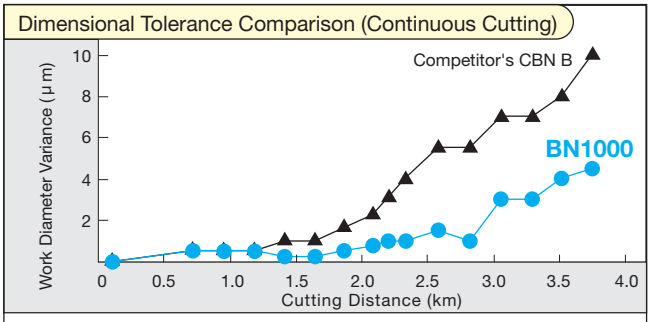
● BN1000/BN2000



Work Material : SCM415H with 8 grooves (58 to 62HRC)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions : vc = 150m/min, f = 0.1mm/rev, ap = 0.2mm, Dry

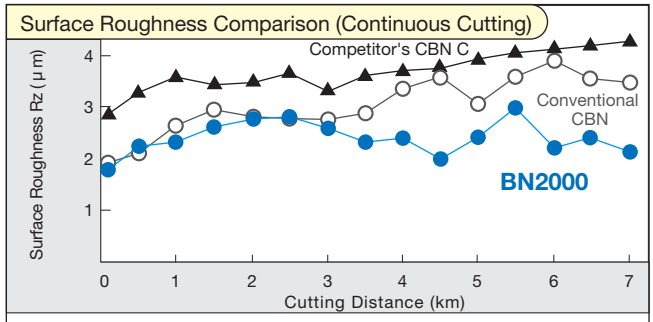
■ Machining Precision

● BN1000



Work Material : SCM415H ø130 O.D. (58 to 62 HRC)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions : vc = 200m/min, f = 0.1mm/rev, ap = 0.1mm Wet

● BN2000

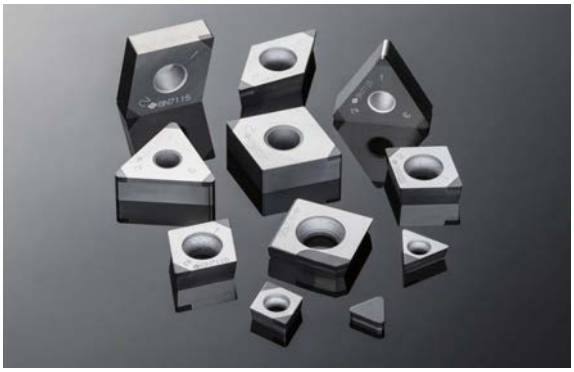


Work Material : SCM415H (58 to 62HRC)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions : vc = 100m/min, f = 0.08mm/rev, ap = 0.2mm, Dry

BN7125 (K Cast Iron, Sintered Alloy) /BN7115 (Sintered Alloy)

VIDEO OF CUTTING
BN7115

New



■ Features

Improved wear resistance through high CBN content. Further, with improved CBN particle/binder boundary strength due to the special binder and improved binding strength between CBN particles thanks to our proprietary sintering process, excellent fracture resistance is achieved.
Provides stable performance for high-speed finishing of cast iron, sintered alloy and exotic alloys.

■ Lineup

● BN7125 New

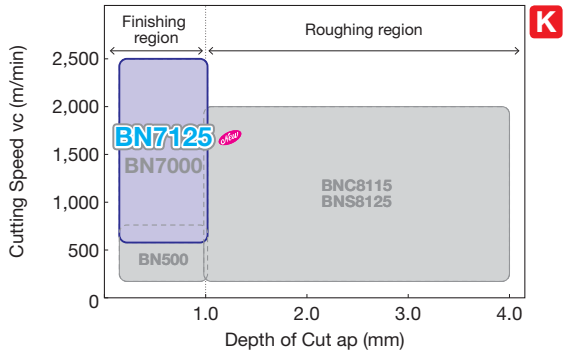
General-purpose Grade for Cast Iron/Sintered Alloy Machining
Achieves high-efficiency machining of sintered alloy with a standard + 3 types of cutting edge variations
Exhibits good thermal crack resistance in high-speed machining of cast iron
Also supports machining of difficult-to-cut materials such as rolls, high speed steel and heat-resistant alloys

● BN7115

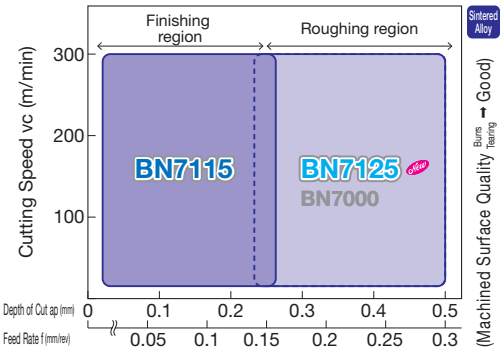
Edge sharpness in sintered alloy machining is excellent, suppressing burrs and tearing

■ Application Range

● Cast Iron



● Sintered Alloy



■ Recommended Cutting Conditions

● Cast Iron (K)

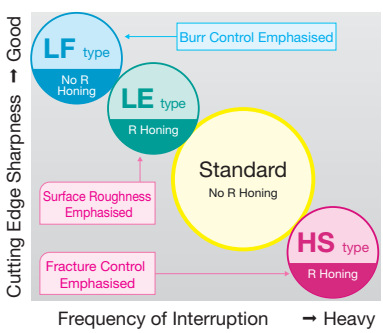
Work Material	Grade	Recommended Cutting Conditions Min. - **Optimum** - Max.		
		Cutting Speed vc (m/min)	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Cast Iron	BN7125	100-**1,000**-2,500	0.05-**0.30**-0.60	0.05-**0.50**-1.00

● Sintered Alloy (Sintered Alloy)

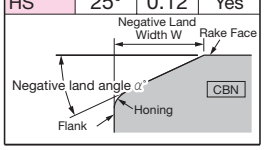
Work Material	Grade	Recommended Cutting Conditions Min. - **Optimum** - Max.		
		Cutting Speed vc (m/min)	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
General	BN7115	10 - **150** - 300	0.01-**0.08**-0.15	0.05-**0.13**-0.25
Sintered Alloy	BN7125	10 - **150** - 300	0.01-**0.15**-0.30	0.05-**0.25**-0.50
High-density	BN7115	10 - **100** - 200	0.01-**0.06**-0.12	0.05-**0.10**-0.20
Sintered Alloy	BN7125	10 - **100** - 200	0.01-**0.15**-0.30	0.05-**0.25**-0.50

■ Recommended Cutting Edge Treatment

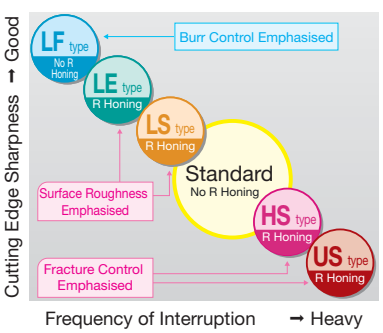
BN7125



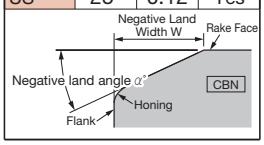
Type	α°	W(mm)	Honing
Standard	15°	0.12	No
LF	Sharp Edge		No
LE	Sharp Edge		Yes
HS	25°	0.12	Yes



BN7115



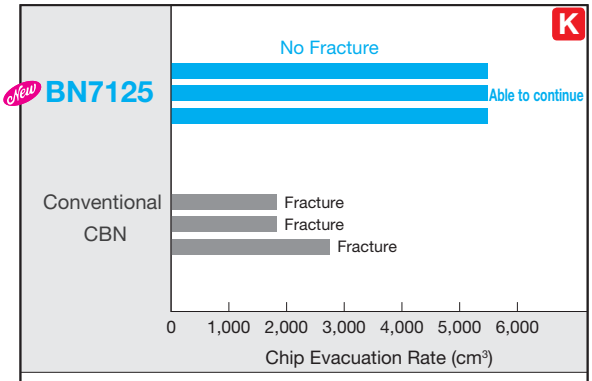
Type	α°	W(mm)	Honing
Standard	15°	0.12	No
LF	Sharp Edge		No
LE	Sharp Edge		Yes
LS	15°	0.07	Yes
HS	25°	0.05	Yes
US	25°	0.12	Yes



BN7125 K Cast Iron Sintered Alloy /BN7115 Sintered Alloy

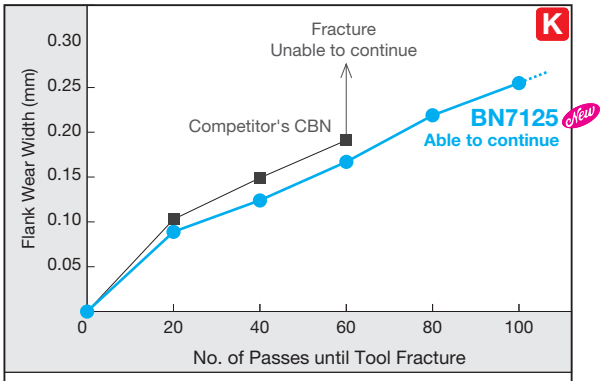
■ Cutting Performance (Cast Iron)

● BN7125 Milling (Fracture Resistance)



Work Material : FC250 (Pearlite)
Tool : FMU4080R, Insert: SNEW1203ADTR
Cutting Conditions : vc = 1,500m/min, fz = 0.13mm/t, ap = 0.3mm, Remainder Wet

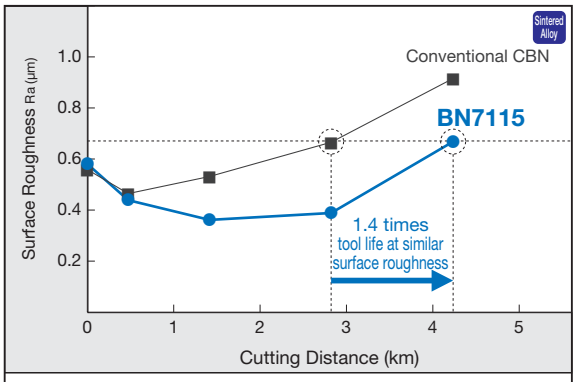
● BN7125 Interrupted Cutting (Fracture Resistance)



Work Material : FC250 with 6 grooves
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions: vc = 750m/min, f = 0.15mm/rev, ap = 0.2mm Wet

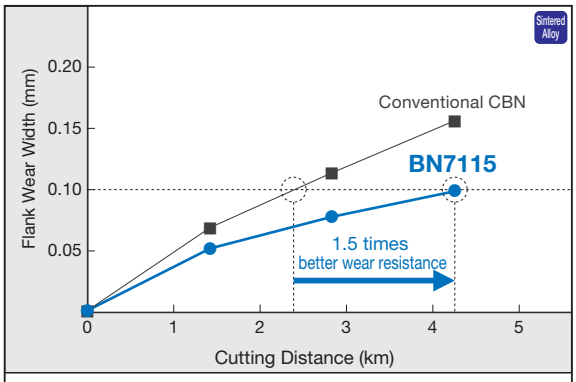
■ Cutting Performance (Sintered Alloy)

● BN7115 Continuous Cutting (Surface Roughness)

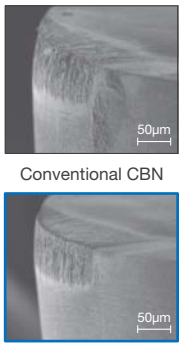


Work Material : Sintered Alloy F-08C2 equivalent (150HV)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions: vc = 200m/min, f = 0.1mm/rev, ap = 0.2mm Wet

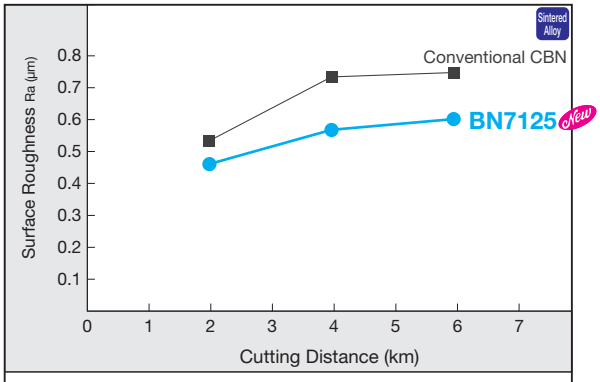
● BN7115 Continuous Cutting (Wear Resistance)



Work Material : Sintered Alloy F-08C2 equivalent (150HV)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions: vc = 200m/min, f = 0.1mm/rev, ap = 0.2mm Wet

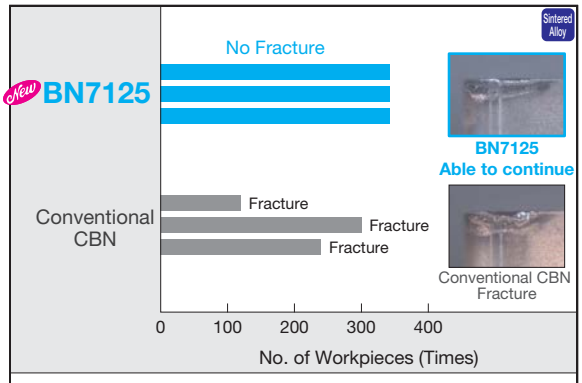


● BN7125 Continuous Cutting (Surface Roughness)



Work Material : Sintered Alloy F-08C2 equivalent (150HV)
Tool Cat. No. : 2NU-CNGA120408
Cutting Conditions: vc = 200m/min, f = 0.1mm/rev, ap = 0.2mm Wet

● BN7125 Interrupted Cutting (Fracture Resistance)



Work Material : Hardened Sintered Alloy FLA-07C2M equivalent (500HV)
Tool Cat. No. : 3NU-TNGA160404LE
Cutting Conditions: vc = 250m/min, f = 0.08mm/rev, ap = 0.5mm Wet

BNC8115/BNS8125 K Cast Iron H Hardened Steel

VIDEO OF CUTTING

■ Features

Covers a wide range of machining applications from roughing to finishing of cast iron, hard-to-cut cast iron and hardened steel.
100% solid CBN structure enables depth-of-cut of 0.5mm and above.

■ Lineup

● BNC8115

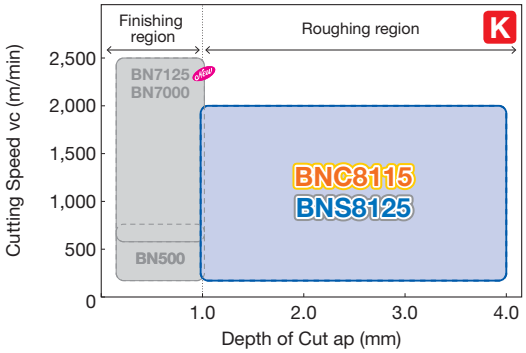
PVD coating with excellent wear resistance suppresses flank wear when machining difficult-to-cut cast iron and hardened steel.
Ideal for roughing and depth-of-cut of 0.5 to 3.0mm. Can also be used for roughing and finishing of gray cast iron.
Gold coating improves visibility of used corners.

● BNS8125

Optimising the particle size distribution of the CBN particles has resulted in improved fracture resistance and longer life while maintaining wear resistance during gray cast iron machining.

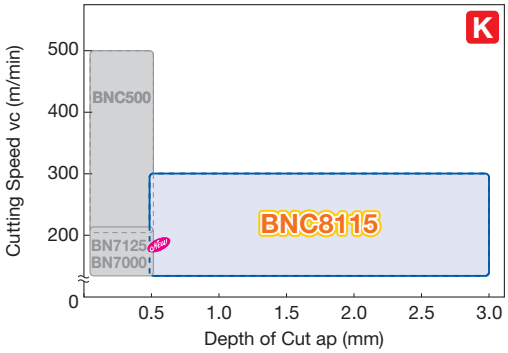
■ Application Range

● Gray Cast Iron

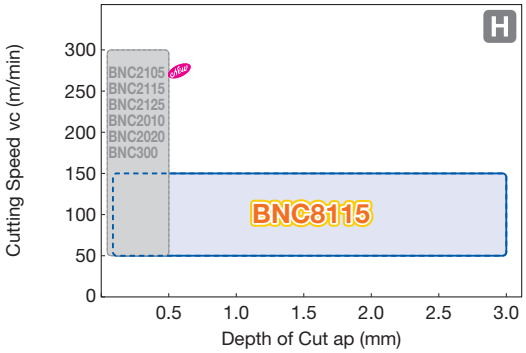


Wet machining is recommended for gray cast iron
For dry machining, BNC8115/BNS8125 are recommended for both roughing and finishing

● Ductile Cast Iron



● Hardened Steel



■ Recommended Cutting Conditions

● Cast Iron (Turning) K

Work Material	Grade	Recommended Cutting Conditions Min. - **Optimum** - Max.		
		Cutting Speed vc (m/min)	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Gray Cast Iron	BNC8115	200-**1,000**-2,000	0.10-**0.50**-1.00	≤ 4.0
	BNS8125	200-**1,000**-2,000	0.10-**0.50**-1.00	≤ 4.0
Ductile Cast Iron	BNC8115	80 - **160** - 300	0.10-**0.30**-0.50	≤ 3.0
	BNS8125	80 - **120** - 200	0.10-**0.30**-0.50	≤ 3.0

● Hardened Steel (Turning) H

Work Material	Grade	Recommended Cutting Conditions Min. - **Optimum** - Max.		
		Cutting Speed vc (m/min)	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Hardened Steel	BNC8115	50 - **100** - 150	0.10-**0.25**-0.40	≤ 3.0

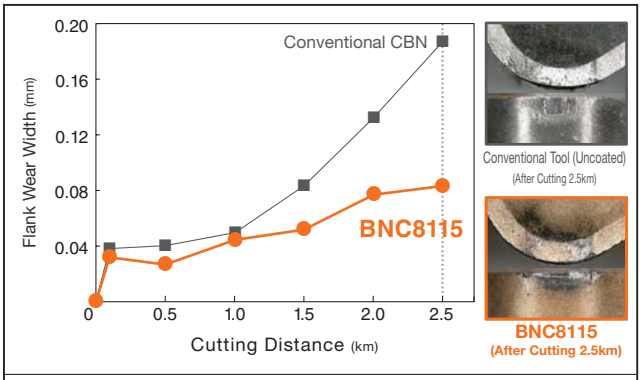
● Cast Iron (Milling) K

Work Material	Grade	Recommended Cutting Conditions Min. - **Optimum** - Max.		
		Cutting Speed vc (m/min)	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Gray Cast Iron	BNC8115	800-**1,400**-2,000	0.10-**0.50**-1.00	≤ 4.0
	BNS8125	800-**1,400**-2,000	0.10-**0.50**-1.00	≤ 4.0

BNC8115/BNS8125 K Cast Iron H Hardened Steel

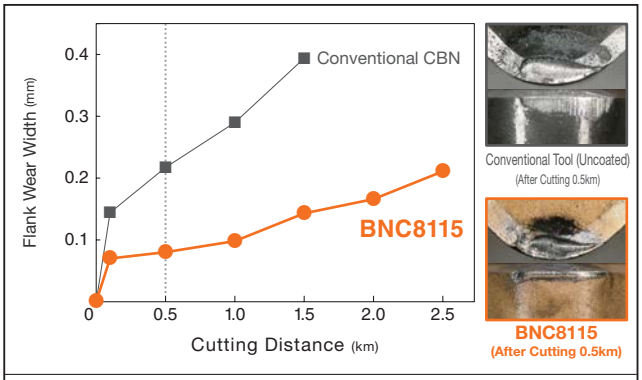
■ Cutting Performance (BNC8115)

● Wear Resistance (Ductile Cast Iron Machining) K



Work Material : FCD450
Tool Cat. No. : SNGN090308
Cutting Conditions : vc = 300m/min, f = 0.2mm/rev, ap = 0.2mm Wet

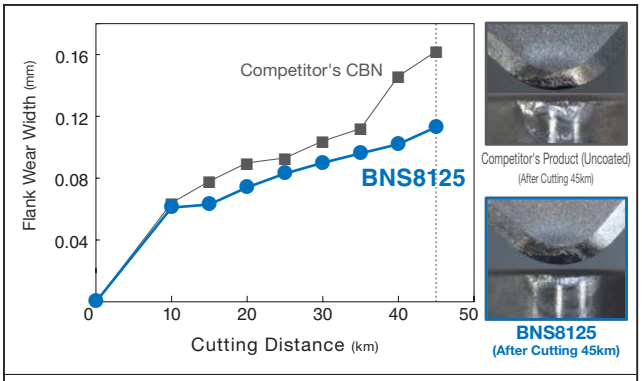
● Wear Resistance (Hardened Steel Machining) H



Work Material : SUJ2 (58 to 62HRC)
Tool Cat. No. : SNGN090308
Cutting Conditions : vc = 150m/min, f = 0.2mm/rev, ap = 0.3mm Wet

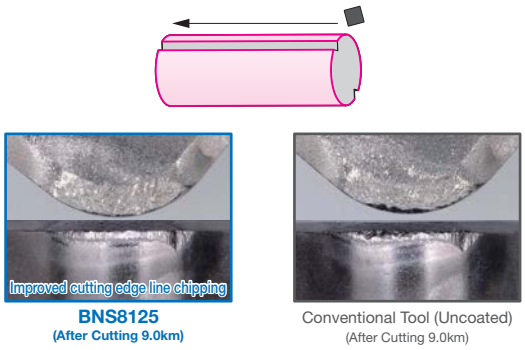
■ Cutting Performance (BNS8125)

● Wear Resistance (Gray Cast Iron Machining) K



Work Material : FC300
Tool Cat. No. : SNGN090308
Cutting Conditions : vc = 800m/min, f = 0.1mm/rev, ap = 0.2mm Wet

● Fracture Resistance (Ductile Cast Iron Machining) K



Work Material : FCD450 with 2 V-grooves
Tool Cat. No. : SNGN120408
Cutting Conditions : vc = 200m/min, f = 0.2mm/rev, ap = 0.5mm Wet

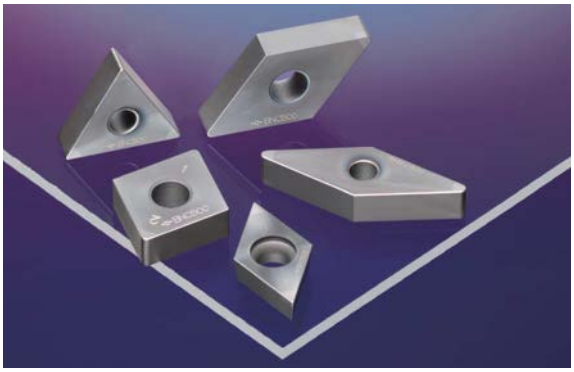
■ Choosing Between BNC8115 and BNS8125 (Cast Iron/Hardened Steel)

Work Material		Coated SUMIBORON BNC8115 Turning	Coated SUMIBORON BNC8115 Milling	SUMIBORON BNS8125 Turning	SUMIBORON BNS8125 Milling	SUMIBORON BN7000 Turning	SUMIBORON BN7000 Milling	Coated SUMIBORON BNC500 Turning	Coated SUMIBORON BNC500 Turning	Coated SUMIBORON BNC2125 Turning	Coated SUMIBORON BNC2125 Turning
K	Gray Cast Iron	○	Best	○	Best Economical	○	Depth of Cut 1.0mm or below High-speed Finishing	—	—	—	—
K	Ductile Cast Iron	○	Depth of Cut 0.5mm or above	○	Interrupted Machining	○	Depth of Cut 0.5mm or below Low-speed Machining	○	Depth of Cut 0.5mm or below	—	—
H	Hardened Steel	○	Depth of Cut 0.5mm or above	—	—	—	—	—	—	○	Depth of Cut 0.5mm or below High-speed Machining

○: Recommendation

BNC500 K Cast Iron

Coated CBN Grade for Ductile Cast Iron Machining



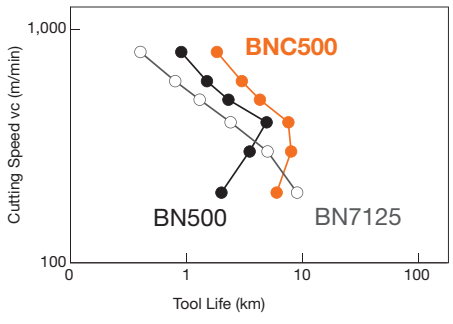
■ Features

Significant improvements in the toughness and wear resistance of the CBN substrate through the use of a newly developed high-purity TiC binder. In addition, the combination with a ceramic coating with excellent thermal resistance provides outstanding wear resistance. High-speed, high-precision machining is achieved when finishing ductile cast iron. Furthermore, long and stable tool life is realised in machining high-strength ductile cast iron, special cast irons such as vermicular cast iron and centrifugally-cast cast iron.

- **Achieves stable tool life for high-speed machining of ductile cast iron**
  Superior wear resistance, making stable machining possible under high-speed conditions.
- **Supports high-precision machining**
  Can maintain excellent dimensional tolerance and surface roughness over many hours.

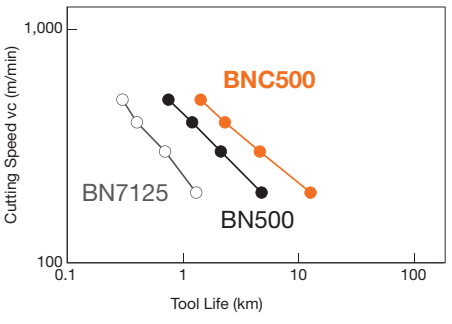
■ Cutting Performance

● FCD450 Continuous Cutting (V-T Chart)



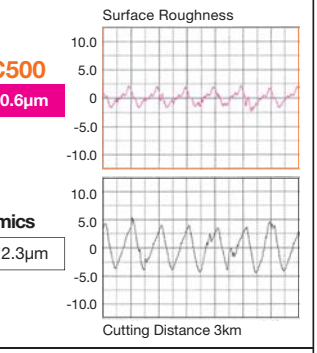
Work Material : FCD450 (160HB) Tool Cat. No.: 4NC-CNGA120408
Cutting Conditions: f = 0.2mm/rev, ap = 0.2mm Wet
Tool Life Criterion : $V_B$max. = 0.2mm

● FCD700 Continuous Cutting (V-T Chart)



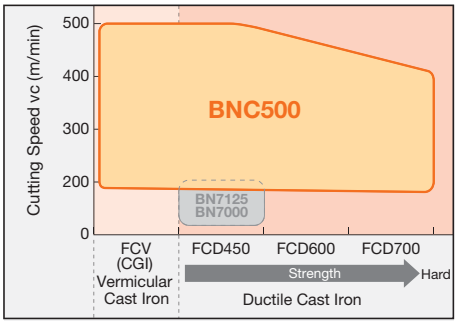
Work Material : FCD700 (260HB) Tool Cat. No.: 4NC-CNGA120408
Cutting Conditions: f = 0.2mm/rev, ap = 0.2mm Wet
Tool Life Criterion : $V_B$max. = 0.2mm

■ Machined Surface Quality

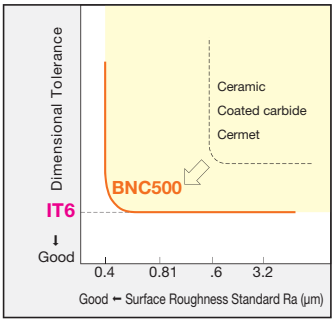


Work Material : FCD700 (260HB)
Cutting Conditions : VC = 400m/min, f = 0.1mm/rev
ap = 0.1mm Wet

■ Application Range



■ High-precision Machining



■ Recommended Cutting Conditions

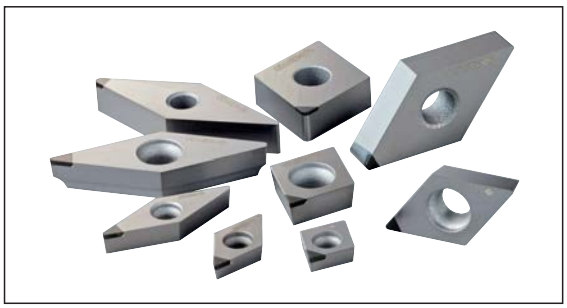
Cutting Speed VC (m/min): 200 – 300 – 400 – 500

Feed Rate f (mm/rev)	Depth of Cut ap (mm)
0.10 to 0.40	≤ 0.50

Cutting Oil: Wet

MEMO

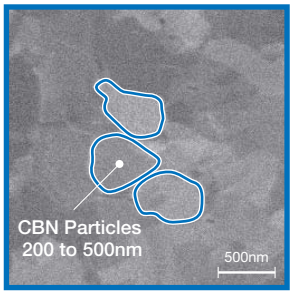
Nano-polycrystalline CBN



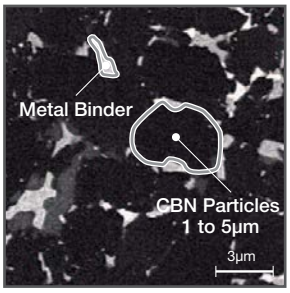
■ Features

SUMIBORON BINDERLESS, which does not contain any binders, is a sintered CBN with directly and strongly bonded nano- to sub-micron CBN particles.
With higher hardness and thermal conductivity than conventional CBN grades, higher efficiency and longer tool life can be realised in machining hard-to-cut materials such as titanium alloys and cobalt-chrome alloys.

■ Sintered Structure (SEM Image)



SUMIBORON BINDERLESS



Conventional CBN

■ Physical Values

	SUMIBORON BINDERLESS	Conventional CBN
CBN Content (vol%)	100	90 to 95
Binder	—	WC-Co
Hardness Hv (GPa)	51 to 54	41 to 44
Thermal Conductivity (W/m·K)	180 to 200	100 to 120

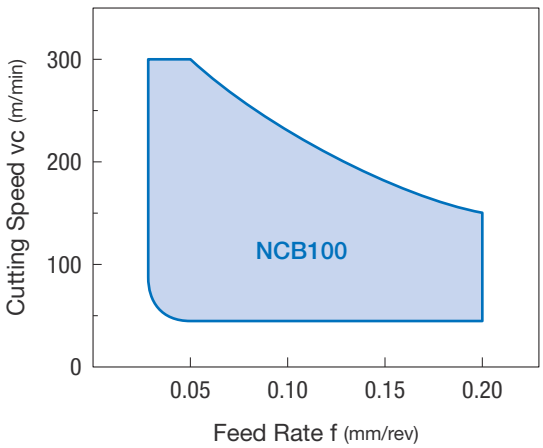
SUMIBORON BINDERLESS NCB100

■ Features

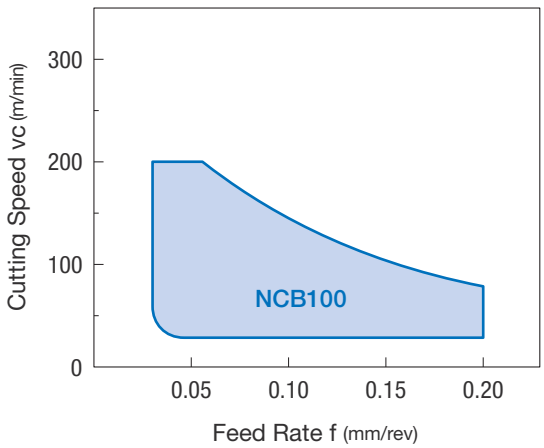
Adopts a nano-polycrystalline CBN sintered structure with hardness and thermal conductivity significantly higher than conventional sintered CBN. Enables overwhelmingly longer tool life, improved efficiency and machining accuracy when machining hard-to-cut materials such as titanium alloys or cobalt-chrome alloys

- Ideal for high-efficiency finishing of hard-to-cut materials such as titanium alloys and cobalt-chrome alloys
  Exhibits outstanding wear resistance due to the excellent hardness and thermal conductivity of nano-polycrystalline CBN
- Excellent dimensional tolerance and machined surface roughness maintained for extended periods
  Number of tool changes can be drastically reduced compared to conventional grades, enabling work efficiency to be improved and total costs to be reduced

■ Application Range (Titanium Alloy Machining)



■ Application Range (Cobalt-chrome Alloy Machining)

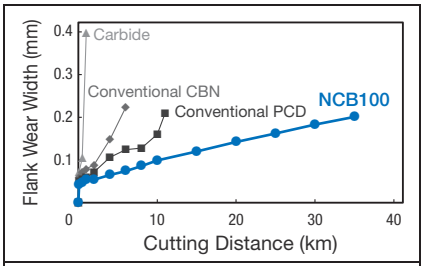


NCB100

K Cast Iron | S Exotic Alloy | Cemented Carbide | Hard Brittle Material

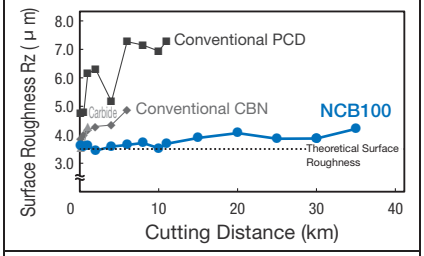
■ Cutting Performance (Titanium Alloy Machining)

● Wear Resistance

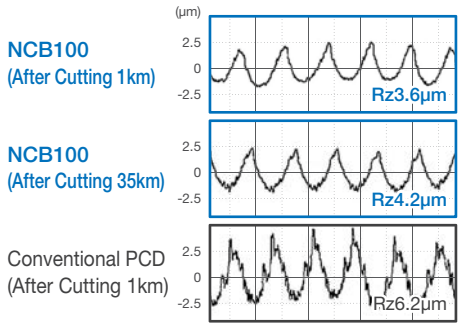


Work Material : Titanium Alloy (Ti-6Al-4V)
Tool Cat. No. : NU-CNGA120408
Cutting Conditions : vc = 150m/min, f = 0.15mm/rev,
ap = 0.5mm Wet (High Pressure Coolant)

● Machined Surface Roughness

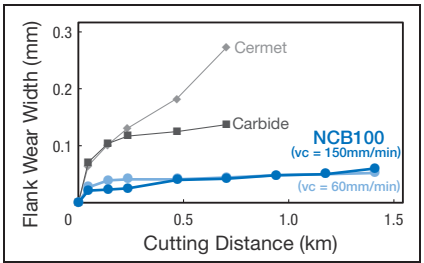


Work Material : Titanium Alloy (Ti-6Al-4V)
Tool Cat. No. : NU-CNGA120408
Cutting Conditions : vc = 150m/min, f = 0.15mm/rev,
ap = 0.5mm Wet (High Pressure Coolant)



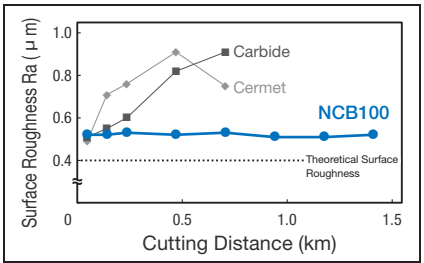
■ Cutting Performance (Cobalt-chrome Alloy Machining)

● Wear Resistance

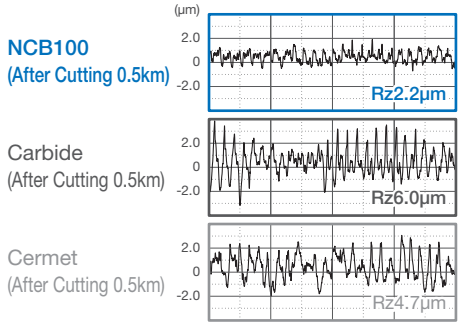


Work Material : Cobalt-chrome Alloy (Forging)
Tool Cat. No. : NU-VNGA160408
Cutting Conditions : vc = 60,150m/min, f = 0.1mm/rev,
ap = 0.4mm Wet

● Machined Surface Roughness



Work Material : Cobalt-chrome Alloy (Forging)
Tool Cat. No. : NU-VNGA160408
Cutting Conditions : vc = 60m/min, f = 0.1mm/rev,
ap = 0.4mm Wet



■ Recommended Cutting Conditions

● Titanium Alloy

Work Material		Grade	Recommended Cutting Conditions (Min. - Optimum - Max.)		
Composition	Hardness (HRC)		Cutting Speed vc (m/min) 50 100 150 200 250 300	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Ti-6Al-4V	30 - 35	NCB100		0.05 - **0.15** - 0.20	0.10 - **0.30** - 0.50
Ti-5Al-5V-5Mo-3Cr	32 - 38	NCB100		0.05 - **0.10** - 0.20	0.10 - **0.30** - 0.50
Ti-10V-2Fe-3Al	32 - 38	NCB100		0.05 - **0.10** - 0.20	0.10 - **0.30** - 0.50

● Cobalt-chrome Alloy

Work Material		Grade	Recommended Cutting Conditions (Min. - Optimum - Max.)		
Composition	Hardness (HRC)		Cutting Speed vc (m/min) 50 100 150 200	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Co-30Cr-5Mo	35 - 45	NCB100		0.05 - **0.15** - 0.20	0.10 - **0.15** - 0.30

● Cemented Carbide

Work Material		Grade	Recommended Cutting Conditions (Min. - Optimum - Max.)		
Composition	Hardness (HRA)		Cutting Speed vc (m/min) 5 10 15 20 25 30 35 40	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
WC-20Co	Less than 85	NCB100		0.03 - **0.10** - 0.20	0.03 - **0.10** - 0.20

*SUMIDIA BINDERLESS NPD10 is recommended for cemented carbide machining of 83HRA or more.

● Others

Work Material		Grade	Recommended Cutting Conditions (Min. - Optimum - Max.)		
Composition/Material	Hardness (HV)		Cutting Speed vc (m/min) 10 50 100 200 300 400	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
Pure Titanium	130 - 230	NCB100		0.05 - **0.10** - 0.20	0.10 - **0.30** - 0.50
Cermet Material (Binder with Ferrous Metals)	1,000 - 1,500	NCB100		0.05 - **0.10** - 0.20	0.10 - **0.20** - 0.30

Insert Identification Code

Regrindable type

Example **C N M A**

(1) Insert Shape — Refer to Table 1
(2) Relief Angle — Refer to Table 2
(3) Tolerance — Refer to Table 3
(4) Insert Hole — Refer to Table 4

One-use type (Disposable)

Example **2 NU - C N G A**

(9) No. of Cutting Edges — Refer to Table 9
(10) Type Code — Refer to Table 10
(1) Insert Shape — Refer to Table 1
(2) Relief Angle — Refer to Table 2
(3) Tolerance — Refer to Table 3
(4) Insert Hole — Refer to Table 4

Table 1: (1) Insert Shape

Symbol	Insert Shape		Apex Angle
C		Diamond type	80°
D			55°
V			35°
R		Round type	—
S		Square type	90°
T		Triangular type	60°
W		Trigon type	80°

Table 2: (2) Relief Angle

Symbol	Relief Angle
B	5°
C	7°
N	0°
P	11°

Table 3: (3) Tolerance

Symbol	Tolerance of Corner Height (mm)	Inscribed Circle (mm)	Thickness (mm)
E	± 0.025	± 0.025	± 0.025
G	± 0.025	± 0.025	± 0.13
M★	±0.08 to ±0.2	±0.05 to ±0.15	± 0.13

★ Generally, these inserts have unground side faces
Refer to page B2 for details on M Class precision

Table 4: (4) Insert Hole

Symbol	Insert Hole	Hole Style	Chipbreaker	Shape (Cross Section)	Symbol	Insert Hole	Hole Style	Chipbreaker	Shape (Cross Section)
N	No	No	No		A	Yes	Straight hole	No	
W	Yes	Straight hole + Single chamfer (40° to 60°)	No		M			One Face	
T			One Face		G			Double-sided	
					X	–	–	–	Special

Table 9: (9) No. of Cutting Edges

Symbol	No. of Cutting Edges	Type
No	1	1-Cornered type
2	2	Multi-Cornered type
3	3	
4	4	
6	6	

Table 10: (10) Type Code (One-Use type)

Symbol	Type	Grade
NC	Coated SUMIBORON	BNC2115,BNC2125,BNC2010,BNC2020, BNC100,BNC160,BNC200,BNC300,BNC500
NU	Uncoated SUMIBORON	BNX10,BNX20,BN1000,BN2000,BN350, BN500,BN7000,BN700,BN7115,BN7500
	SUMIBORON BINDERLESS	NCB100
NS	Uncoated SUMIBORON	BNX25

*The NS type is a one-use insert for the BNX25 grade, using the latest brazing technique. The shape is the same as the NU type.
*Cat. numbers that begin with a "T-" are 10-piece packs

Codes (1), (2), (3), and (4) show typical examples.

Insert Identification Code

12 04 08 (-)B

(5) (6) (7) (8)

- (5) Cutting Edge Length — Refer to Table 5
- (6) Thickness — Refer to Table 6
- (7) Corner Radius — Refer to Table 7
- (8) Additional Information — Refer to Table 8

12 04 08 LT

(5) (6) (7) (8)

- (5) Cutting Edge Length — Refer to Table 5
- (6) Thickness — Refer to Table 6
- (7) Corner Radius — Refer to Table 7
- (8) Additional Information — Refer to Table 8

Table 5: (5) Cutting Edge Length (Side Length) (Typical Examples) Note: Cutting edge length indicated is measured without corner radii. (mm)

Shape	Symbol	Cutting Edge Length (Side Length)	Inscribed Circle
C 80° Diamond type	04	4.97	4.30
	06	6.4	6.35
	08	8.0	7.94
	09	9.7	9.525
	12	12.9	12.70
D 55° Diamond type	07	7.7	6.35
	11	11.6	9.525
	15	15.5	12.70
R Round type	09	9.525	9.525
	12	12.70	12.70
S Square type	09	9.525	9.525
	12	12.70	12.70
T Triangular type	06	6.9	3.97
	08	8.2	4.76
	09	9.6	5.56
	11	11.0	6.35
	16	16.5	9.525
	22	22.0	12.70
V 35° Diamond type	08	8.3	4.76
	11	11.1	6.35
	16	16.6	9.525
W Trigon type	06		
	08	8.7	4.6

Shape	Symbol	Cutting Edge Length (Side Length) Negative	Cutting Edge Length (Side Length) Positive	Inscribed Circle Negative	Inscribed Circle Positive
W Trigon type	06		3.2		3.97
	08	8.7	4.6	12.70	4.76

For the One-Use type, cutting edge length indicates the side length of the CBN tip
See L34 ~ for the One-Use type cutting edge length

Table 6: (6) Thickness

Symbol	Thickness (mm)
X1	*
01	1.59
02	2.38
03	3.18
T3	3.97
04	4.76
06	6.35

(*)
CC□T03X1 Insert Thickness: 1.40
CC□T04X1 Insert Thickness: 1.80

Table 7: (7) Corner Radius

Symbol	Corner Radius (mm)
00	Sharp Edged
01	0.1
02	0.2
04	0.4
08	0.8
12	1.2
16	1.6
20	2.0
24	2.4

Table 8 (8) Additional Information L30

Symbol	Old symbol	Code Description		Symbol	Code Description
		Uncoated	Coated		
No	No	Standard Cutting Edge		WG	Wiper Insert type
(-)B	(-)B	Full-top CBN type		WH	
-BSTN	-BSN	Full-top CBN type (emphasis on edge sharpness)		W	
LF	F	Sharp Edge type		LFW	Wiper Sharp Edge type
LE				N-FV	Chipbreaker type
LT	S	Emphasis on Edge Sharpness		N-LV	
LS	M	General-purpose type for Continuous Cutting	Emphasis on Edge Sharpness	N-SV	
ES	—	-	High-efficiency type		
HT	T	Strong Edged			
HS					
US	—	Strong Edged			

Codes (5), (6) and (7) show typical examples.

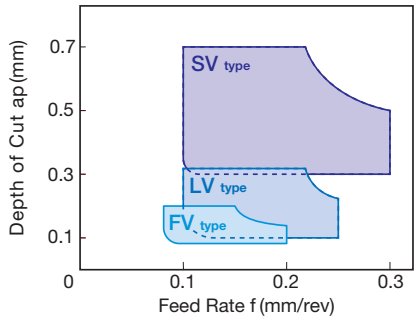
FV type/LV type/SV type

VIDEO OF CUTTING
FV type / LV type

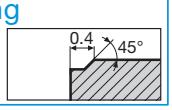
■ Features

- One-use SUMIBORON insert with chipbreaker.
  SV type is ideal for carburised layer removal, while FV and LV types are ideal for hardened steel machining.
- Chipbreaker incorporated on the CBN cutting edge to maintain chip control capabilities throughout the machining process.
- Unique chipbreaker design can be applied to both hardened and non-hardened parts with effective chip control.

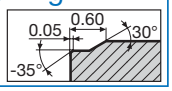
■ Application Range



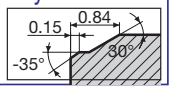
FV type For Finishing
Excellent chip evacuation under finishing conditions with depth of cut at 0.2mm or below



LV type For Light Cutting
Excellent chip evacuation with depth of cut at 0.3mm or below



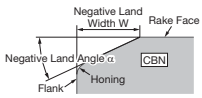
SV type For Carburised Layer Removal
Ideal for carburised layer removal
Eliminates choked stoppages and dimensional defects



■ FV type / LV type / SV type Cutting Edge Specifications

Type	Series	Notation	Cutting Edge Specification Identification Code	α	W	Honing
With Chipbreaker	FV type	N-FV	—	0°	0	Yes
	LV type	N-LV	S00535	35°	0.05	Yes
	SV type	N-SV	S01235	35°	0.12	Yes

Cutting edge specification identification code: S 0 0 5 3 5

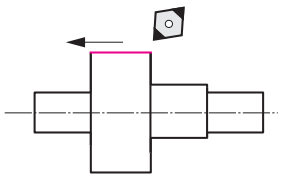


- Negative land width
- Negative land angle
- Cutting Edge Shape T: Negative Land
  S: Negative Land + Honing

Example: S00535
→ 35°/0.05mm Negative Land with Honing

■ Application Examples

External Carburized Layer Removal



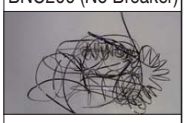
- No constant stoppages or incorrect part dimension problems and the chips are small.
- Double the tool life of competitors' CBN.

Work Material : SCr420 Carburised Steel (Shaft)
Tool Cat. No. : 4NC-CNGG120408N-SV (BNC200)
Cutting Conditions : vc = 150m/min, f = 0.15mm/rev
ap = 0.5mm, 2 Passes Wet

BREAK MASTER SV type

Tool Life = 200 pcs.

BNC200 (No Breaker)

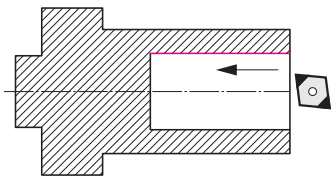


Tool Life = 200 pcs.

Competitor CBN (with chipbreaker)

Tool Life = 100 pcs.

Finishing of Hardened Steel



- Improved chip control for internal boring

BREAK MASTER FV type

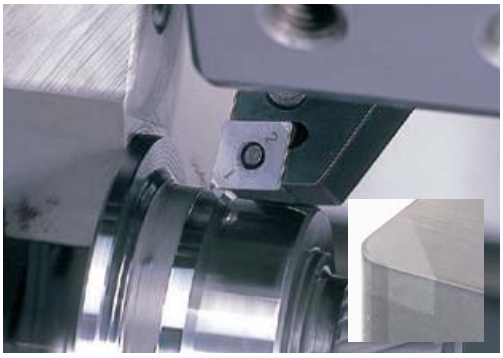
Tool Life = 300 pcs.

BNC200 (No Breaker)

Tool Life = 300 pcs.

Work Material : Carburised Steel (60HRC Automotive Component)
Tool Cat. No. : 2NC-CCGT060204N-FV (BNC200)
Cutting Conditions : vc = 80m/min, f = 0.08mm/rev
ap = 0.15mm Wet

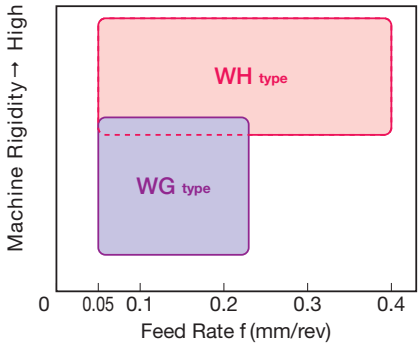
WG/WH type



■ Features

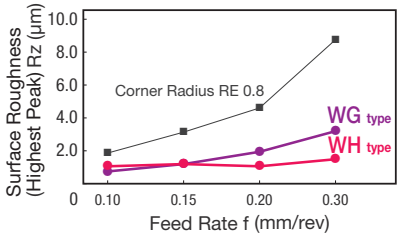
- SUMIBORON one-use insert with wiper flat for hardened steel machining.
- Excellent surface roughness comparable to grinding.
- Improved machining efficiency with higher speeds and feeds.
- Lineup of low feed WG type and high feed WH type.

■ Application Range



Use WH type for high-rigidity workpieces and equipment, and WG type for issues of undulation or chatter.

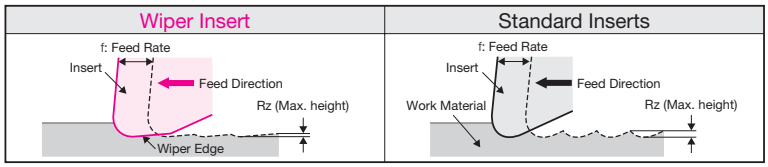
■ Surface Finish



The wiper insert offers good surface finish and improved machining efficiency.

Work Material: SCM415H (60HRC)
Tool Cat. No.: CNGA120408
Cutting Conditions: vc = 135m/min, ap = 0.1mm, Dry

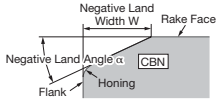
■ Wiper Insert Operation



■ WG type / WH type Cutting Edge Specifications

Type	Series	Notation	Cutting Edge Specification Identification Code	α	W	Honing
Wiper	WG type	WG	S01215	15°	0.12	Yes
	WH type	WH	S01215	15°	0.12	Yes

Cutting edge specification identification code **S 0 1 2 1 5**



- 1st digit: Cutting Edge Shape — T: Negative Land, S: Negative Land + Honing
- 2nd digit: Negative land width
- 3rd digit: Negative land angle

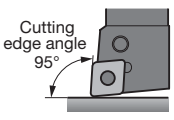
Example: S01215
→ 15°/0.12mm Negative Land with Honing

■ Precautions when Using Wiper Inserts

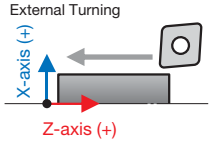
CNGA type/CCGW type/WNGA type

WG type / WH type Wiper Insert

- Use a holder with a cutting edge angle of 95°.
- Machining program modification required as CNGA type / CCGW type / WNGA type wiper inserts do not comply with the ISO standard profiles. Correct the cutting edge position (tool offset) as explained on the right.



CNGA type / CCGW type / WNGA type Wiper Insert Cutting Edge Position Offset (WG type / WH type)

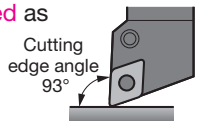


Corner Radius	Type	X-axis direction	Z-axis direction
R0.4	WG type	-0.02	-0.02
	WH type	-0.06	-0.06
R0.8/R1.2	WG type	-0.01	-0.01
	WH type	-0.06	-0.06

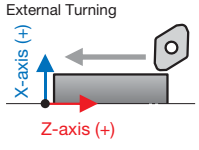
DNGA type / DCGW type

WG type / WH type Wiper Insert

- Use a holder with a cutting edge angle of 93°.
- Machining program modification required as DNGA type / DCGW type wiper inserts do not comply with the ISO standard profiles. Correct the cutting edge position (tool offset) as explained on the right.



DNGA type / DCGW type Wiper Insert Cutting Edge Position Offset (WG type / WH type)



Corner Radius	Type	X-axis direction	Z-axis direction
R0.4	WG type	-0.17	-0.01
	WH type	-0.70	-0.06
R0.8	WG type	-0.05	0
	WH type	-0.58	-0.05

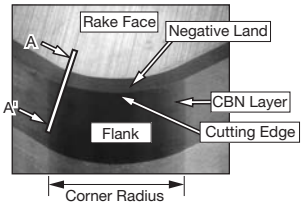
Note: Unlike other contour shapes, the DNGA/DCGW types can only exhibit wiper effect for external and internal diameter machining, and cannot be used for facing.

SUMIBORON Insert Edge Specifications

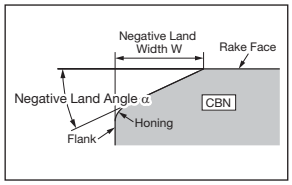
SUMIBORON Insert Edge Treatment

All SUMIBORON inserts are enhanced with the optimum cutting edge preparation for the various grades and geometries (shown on the right). This is to avoid cutting edge fracture caused by heavy loads generated during the machining of high-hardness materials such as hardened steel. As the pioneer of CBN tools, SUMIBORON's vast selection of grades and edge treatment combinations is our trump card for hardened steel machining.

Close-up of cutting edge



Section A-A'



■ SUMIBORON Insert Edge Specification Overview

Series	Work Material	Grade	Neg.-Pos.	Standard				Low Cutting Force L / High-efficiency type E					Strong Edged H / U				
				Cutting Edge Specification Identification Code	α	W	Honing	Notation	Cutting Edge Specification Identification Code	α	W	Honing	Notation	Cutting Edge Specification Identification Code	α	W	Honing
Uncoated SUMIBORON	Hardened Steel	BNX10	Negative/Positive	T01225	25°	0.12	No	—	—	—	—	—	—	—	—	—	—
		BNX20	Negative/Positive	S01225	25°	0.12	Yes	LT	T01215*	15°	0.12	No	—	—	—	—	—
		BNX25	Negative/Positive	S01725	25°	0.17	Yes	—	—	—	—	—	—	—	—	—	—
		BN1000	Negative/Positive	S01225	25°	0.12	Yes	—	—	—	—	—	—	—	—	—	—
		BN2000	Negative/Positive	S01225	25°	0.12	Yes	LT	T01215	15°	0.12	No	HS	S01235	35°	0.12	Yes
		BN350	Negative	T01225	25°	0.12	No	—	—	—	—	—	HT	T01235	35°	0.12	No
			Positive	T01235	35°	0.12	No						—	—	—	—	—
	Cast Iron Sintered Alloy Exotic Alloy	BN500	Negative/Positive	T01215	15°	0.12	No	—	—	—	—	—	—	—	—	—	—
		BN7125	Negative/Positive	T01215	15°	0.12	No	LF	—	0°	0	No	HS	S01225	25°	0.12	Yes
								LE	—	0°	0	Yes					
		BN7000	Negative/Positive	T01215	15°	0.12	No	LF	—	0°	0	No	HS	S01225	25°	0.12	Yes
		BN700	Negative/Positive	T01215	15°	0.12	No	LF	—	0°	0	No	HS	S01225	25°	0.12	Yes
		BN7115	Negative/Positive	T01215	15°	0.12	No	LF	—	0°	0	No	HS	S00525	25°	0.05	Yes
								LE	—	0°	0	Yes	US	S01225	25°	0.12	Yes
								LS	S00715	15°	0.07	Yes	—	—	—	—	—
		BN7500	Negative/Positive	T01215	15°	0.12	No	LF	—	0°	0	No	HS	S00525	25°	0.05	Yes
								LE	—	0°	0	Yes					
								LS	S00715	15°	0.07	Yes					
		BNS8125	Negative	T02020	20°	0.2	No	LF	—	—	—	No	—	—	—	—	—
Coated SUMIBORON	Hardened Steel	BNC2105	Negative/Positive	S01225	25°	0.12	Yes	LS	S00515	15°	0.05	Yes	—	—	—	—	—
		BNC2115	Negative/Positive	S01225	25°	0.12	Yes	LS	S00515	15°	0.05	Yes	HS	S01730	30°	0.17	Yes
		BNC2125	Negative/Positive	S01225	25°	0.12	Yes	LS	S00515	15°	0.05	Yes	HS	S02735	35°	0.27	Yes
		BNC2010	Negative/Positive	S01225	25°	0.12	Yes	LE	—	0°	0	Yes	HS	S01730	30°	0.17	Yes
		BNC2020	Negative/Positive	S01225	25°	0.12	Yes	LT	T00515	15°	0.05	No	HS	S02735	35°	0.27	Yes
								ES	S00535	35°	0.05	Yes					
		BNC100	Negative/Positive	S01225	25°	0.12	Yes	LS	S01715	15°	0.17	Yes	—	—	—	—	—
		BNC160	Negative/Positive	S01225	25°	0.12	Yes	LS	S01020	20°	0.10	Yes	HS	S01730	30°	0.17	Yes
		BNC200	Negative/Positive	S01225	25°	0.12	Yes	LS	S01015	15°	0.10	Yes	HS	S01735	35°	0.17	Yes
		BNC300	Negative/Positive	S01225	25°	0.12	Yes	LS	S00515	15°	0.05	Yes	HS	S01735	35°	0.17	Yes
	Cast Iron	BNC500	Negative/Positive	S01215	15°	0.12	Yes	—	—	—	—	—	HS	S01225	25°	0.12	Yes
	Cast Iron/Hardened Steel	BNC8115	Negative	S02020	20°	0.2	Yes	—	—	—	—	—	—	—	—	—	—
SUMIBORON BINDERLESS	Cast Iron / Exotic Alloy Cemented Carbide / Hard Brittle Material	NCB100	Negative/Positive	T01215	15°	0.12	No	—	—	—	—	—	—	—	—	—	—

*BNX20 inserts with an inscribed circle of less than ø4.76 will have an identification code of T00715.

■ Insert Edge Specification with Wiper/Chipbreaker

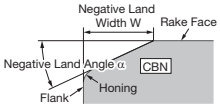
Type	Notation	Cutting Edge Specification Identification Code	α	W	Honing	Uncoated SUMIBORON		Coated SUMIBORON							
						BN2000	BNS8125	BNC2115	BNC2125	BNC2010	BNC2020	BNC100	BNC160	BNC200	BNC500	BNC8115
Wiper	WG	S01215	15°	0.12	Yes	●		●	●	●	●		●	●		
	WH	S01215	15°	0.12	Yes	●		●	●	●	●		●	●		
	W	S01215	15°	0.12	Yes								●	●	●	
		S01715	15°	0.17	Yes							●				
		S02020	20°	0.20	Yes											●
		T02020	20°	0.20	No		●									
Wiper Sharp Edge	LFW	—	0°	0	No		□									
With Chipbreaker	N-FV	—	0°	0	Yes	●		●	●	●	●		●	●		
	N-LV	S00535	35°	0.05	Yes	●		●	●	●	●		●	●		
	N-SV	S01235	35°	0.12	Yes			●	●	●	●		●	●		

● mark: Standard stocked item □ mark: Made-to-order item

■ Edge Specification Identification Code

Edge Treatment Notation				
No	Standard Cutting Edge			
L	Low Cutting Force	+	F	Sharp Edge
E	High Efficiency		E	Honing
H	Strong Edged		T	Negative Land
U	Strong Edged		S	Negative Land + Honing
WG/WH/W	Wiper			
N-FV/N-LV/N-SV	With Chipbreaker			

● Cutting edge specification identification code



S 0 1 2 2 5

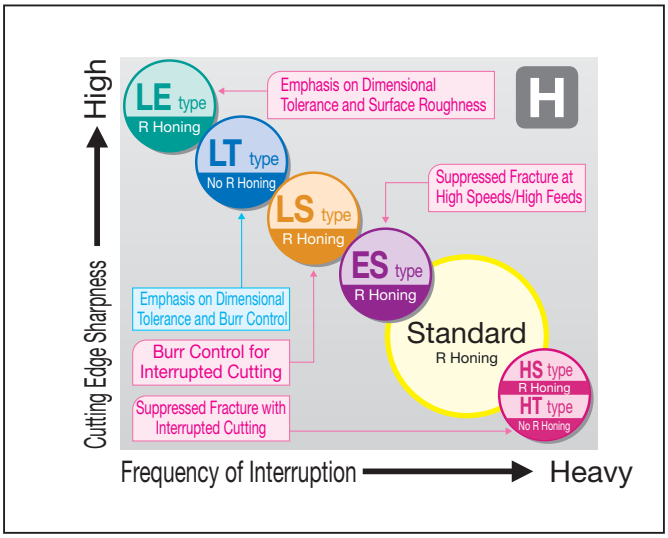
Negative land width
Negative land angle
Cutting Edge Shape T : Negative Land S : Negative Land + Honing

Example: S01225
→ 25°/0.12mm Negative Land with Honing

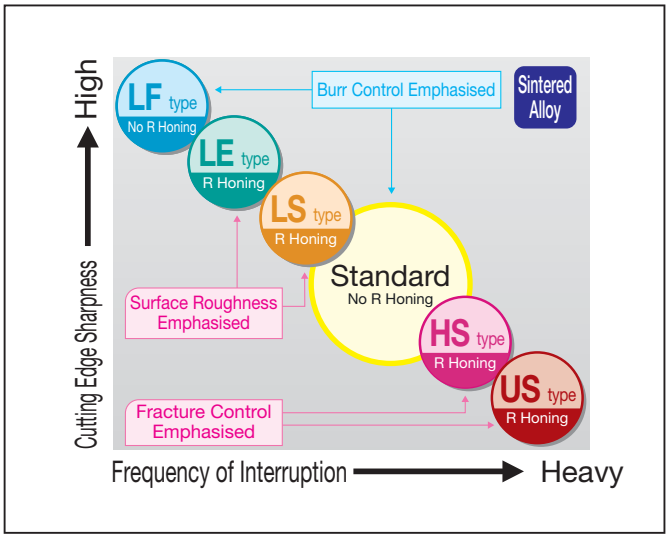
SUMIBORON Insert Edge Specifications

■ Edge Treatment Performance

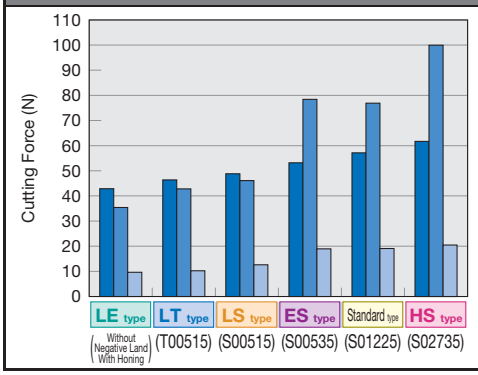
Machining of Hardened Steel



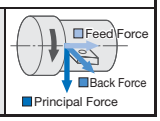
Machining of Sintered Alloy



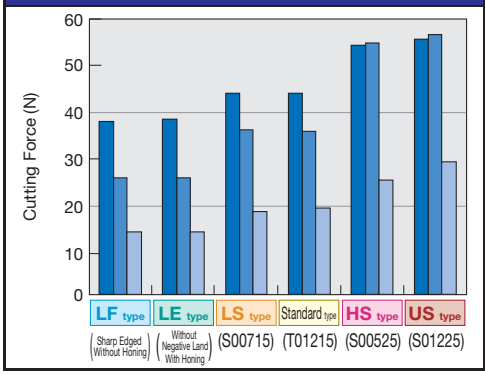
Comparison of Cutting Force with Coated SUMIBORON (vc = 100mm/min)



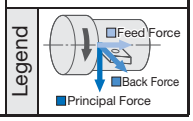
Work Material:
SCM415H
Tool Cat. No.
DNGA150408
Cutting Conditions:
vc = 100m/min
f = 0.1mm/rev
ap = 0.1mm
Dry



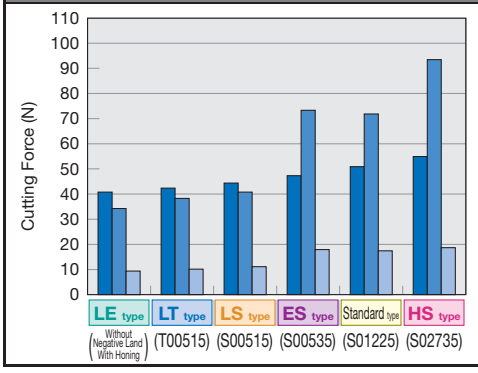
Cutting Force Comparison (Feed Rate: f = 0.05mm/rev)



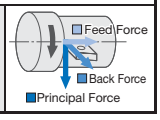
Work Material:
F-08C2 equivalent
Tool Cat. No.
CNGA120408
Cutting Conditions:
vc = 200m/min
f = 0.05mm/rev
ap = 0.2mm
Dry



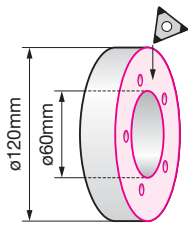
Comparison of Cutting Force with Coated SUMIBORON (vc = 200mm/min)



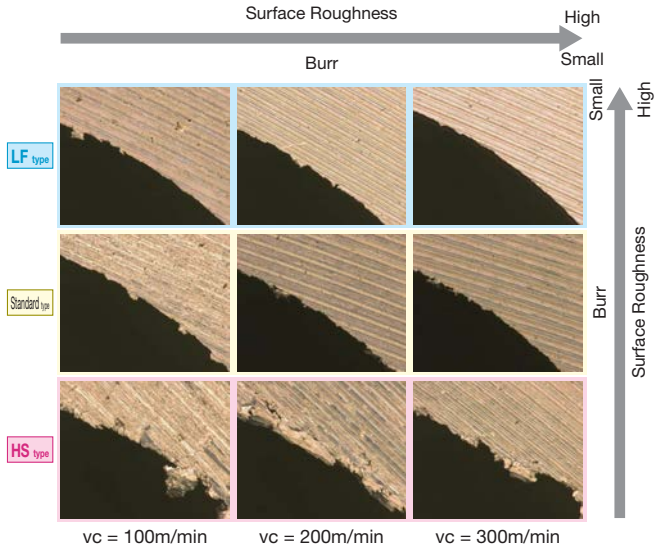
Work Material:
SCM415H
Tool Cat. No.
DNGA150408
Cutting Conditions:
vc = 200m/min
f = 0.1mm/rev
ap = 0.1mm
Dry



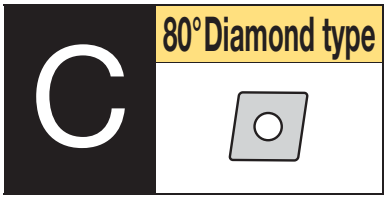
Relationship between Cutting Edge Treatment and Machining Quality



Work Material: F-08C2 equivalent
Tool Cat. No.: 3NU-TNGA 160408 (BN7500)
Cutting Edge Specification: LF type, Standard, HS type
Cutting Conditions: vc = 100, 200, 300m/min
f = 0.1mm/rev
ap = 0.2mm
Wet



SUMIBORON Inserts



Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

CN■■1204●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron					✱		○	◔					✱	
S	Exotic Alloy							●	◔					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components							◔				●			

Applicable External Holders ☞ C10 to C12 Applicable Internal Holders ☞ E15, E23 to E25

One-Use type / Negative (With Hole)

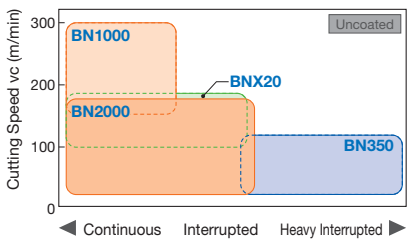
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-CNMA 120402**	1	1	0.2	2.5			—		●								—	—
		120404			0.4	2.5	●	●	—	●	●	●	●		●	▲			—	—
		120408			0.8	2.4	●	●	—	●	●	●	●		●	▲			—	—
		120412			1.2	2.3	●	●	—	●	●	●	●		●	▲			—	—
	Standard	**T-NU-CNMA 120402**	10	1	0.2	2.5			—										—	—
		120404			0.4	2.5	●	●	—	●	●	●	●						—	—
		120408			0.8	2.4	●	●	—	●	●	●	●						—	—
		120412			1.2	2.3	●	●	—	●	●	●	●						—	—
	Standard	**NS-CNMA 120404**	1	1	0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		120408			0.8	2.4	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		120412			1.2	2.3	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
	Standard	**T-NS-CNMA 120404**	10	1	0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		120408			0.8	2.4	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		120412			1.2	2.3	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
	Standard	**NU-CNGA 120404**	1	1	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—	●
		120408			0.8	2.4	—	—	—	—	—	—	—	—	—	—	—	—	—	●
		120412			1.2	2.3	—	—	—	—	—	—	—	—	—	—	—	—	—	●

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

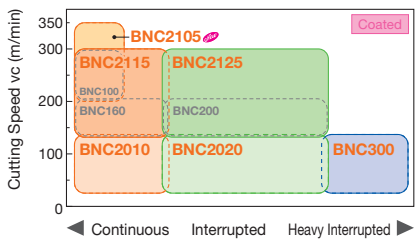
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

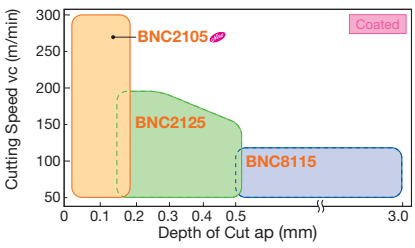
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

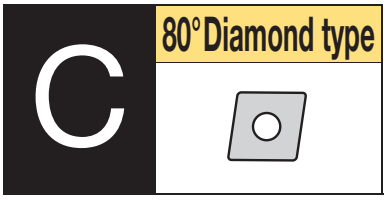


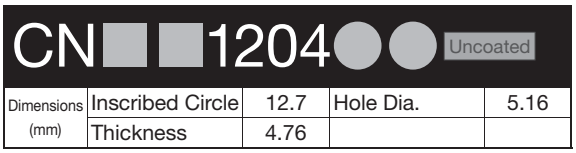
H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts





(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	K Cast Iron							○	◕					✖	
	S Exotic Alloy								●					◕	●
	H Hardened Steel	○	◔	✱	●	◕	✖								
	Sintered Components								◕			●			

Uncoated SUMIBORON | BINDERLESS SUMIBORON

Applicable External Holders ☞ C10 to C12 | Applicable Internal Holders ☞ E15, E23 to E25

Multi-Cornered One-Use type / Negative (With Hole)

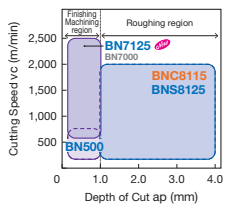
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-CNGA 120404**	1	2	0.4	2.5		●	—	●	●	●		○	●	▲	●	●	—	
		120408			0.8	2.4		●	—	●	●	●		○	●	▲	●	●	—	
		120412			1.2	2.3		●	—	●	●	●		○	●	▲	●	●	—	
	Standard	**T-2NU-CNGA 120404**	10	2	0.4	2.5		●	—		●								—	—
		120408			0.8	2.4		●	—		●	●		○	●	▲			—	—
		120412			1.2	2.3		●	—		●								—	—
	Standard	**2NS-CNGA 120404**	1	2	0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		120408			0.8	2.4	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		120412			1.2	2.3	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
	Standard	**T-2NS-CNGA 120404**	10	2	0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		120408			0.8	2.4	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		120412			1.2	2.3	—	—	▲	—	—	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

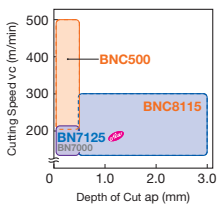
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

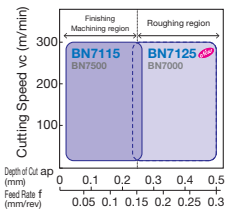
K Gray Cast Iron



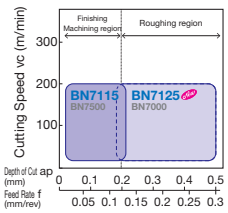
K Ductile Cast Iron



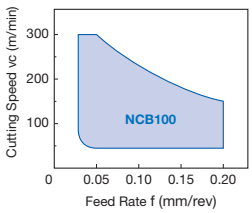
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

C 80° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

CN■■1204●● Uncoated

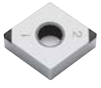
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ●: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	●	✱								
	Sintered Components								●			●			

Applicable External Holders ☞ C10 to C12 Applicable Internal Holders ☞ E15, E23 to E25

Multi-Cornered One-Use type / Negative (With Hole)

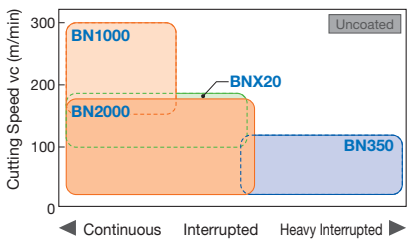
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Low Feed Wiper Insert	2NU-CNGA 120404WG	1	2	0.4	2.4			—		●								—	
		120408WG			0.8	2.4			—		●								—	
		120412WG			1.2	2.3			—		●								—	
	High Feed Wiper Insert	2NU-CNGA 120404WH	1	2	0.4	2.4			—		●								—	
		120408WH			0.8	2.3			—		●								—	
		120412WH			1.2	2.2			—		●								—	
	Light Cutting Chipbreaker	2NU-CNGM 120404N-LV	1	2	0.4	2.5	—	—	—		●	—	—	—	—	—	—	—	—	—
		120408N-LV			0.8	2.4	—	—	—		●	—	—	—	—	—	—	—	—	—
		120412N-LV			1.2	2.3	—	—	—		●	—	—	—	—	—	—	—	—	—
	L Low Resistance F Sharp Edge	2NU-CNGA 120404LF	1	2	0.4	2.5	—	—	—	—	—	—	—	○	●	▲	●	●	—	—
		120408LF			0.8	2.4	—	—	—	—	—	—	—	○	●	▲	●	●	—	—
		120412LF			1.2	2.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	L Low Resistance E With Honing	2NU-CNGA 120404LE	1	2	0.4	2.5	—	—	—	—	—	—	—	○	—	—	●	●	—	—
		120408LE			0.8	2.4	—	—	—	—	—	—	—	○	—	—	●	●	—	—
	L Low Resistance T Negative Land	2NU-CNGA 120404LT	1	2	0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		120408LT			0.8	2.4	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		120412LT			1.2	2.3	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NU-CNGA 120404LS	1	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	●	●	—	—
		120408LS			0.8	2.4	—	—	—	—	—	—	—	—	—	—	—	●	—	—
	H Strong Edge T Negative Land	2NU-CNGA 120404HT	1	2	0.4	2.5	—	—	—	—	—	●	—	—	—	—	—	—	—	—
		120408HT			0.8	2.4	—	—	—	—	—	●	—	—	—	—	—	—	—	—
		120412HT			1.2	2.3	—	—	—	—	—	●	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

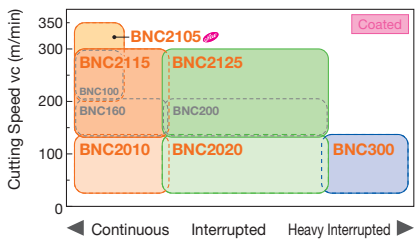
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

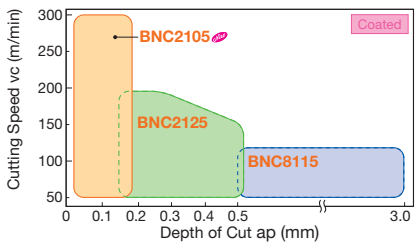
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

C 80° Diamond type

CN■■1204●● Uncoated

Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		
K	Cast Iron	○ ◕ ✖
S	Exotic Alloy	◕ ◕ ◕
H	Hardened Steel	○ ◔ ✖ ● ◕ ✖
	Sintered Components	◕ ●

Applicable External Holders ☞ C10 to C12 Applicable Internal Holders ☞ E15, E23 to E25

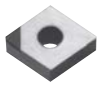
Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	H Strong Edge S Negative Land With Honing	**2NU-CNGA 120404HS**	1	2	0.4	2.5	—	—	—	—	●	—	—	○	●	▲	●		—	—
		120408HS			0.8	2.4	—	—	—	—	●	—	—	○	●	▲			—	—
		120412HS			1.2	2.3	—	—	—	—	●	—	—	○	●				—	—
	U Strong Edge S Negative Land With Honing	**2NU-CNGA 120404US**	1	2	0.4	2.5	—	—	—	—	—	—	—	—	—	—	●	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

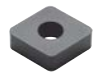
*Depth of cut for one-use types is 0.5mm or less.

Negative type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**CNMA 120404**	1	1	0.4	4.6		●			●		●						—	—
		120408			0.8	4.5		●			●		●		●	▲			—	—
		120412			1.2	4.4		●			●		●		●	▲			—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

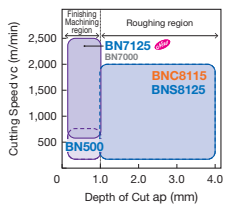
Solid type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**CNGA 120408**	1	4	0.8	12.9	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120412			1.2	12.9	—	—	—	—	—	—	—	—	—	—	—	—	●	—

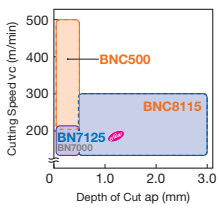
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

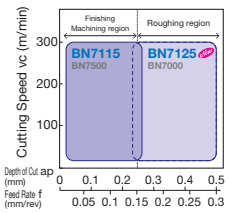
K Gray Cast Iron



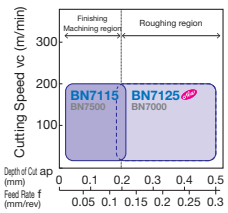
K Ductile Cast Iron



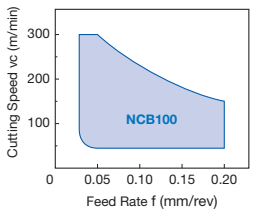
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy

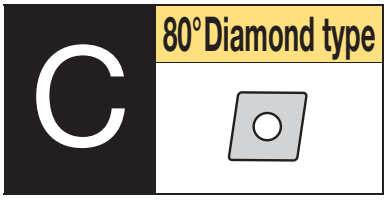


S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts



Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Coated SUMIBORON									
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✱
S	Exotic Alloy											
H	Hardened Steel	○	●	◔	○	◔	✱					
	Sintered Components											

CNG■1204●● Coated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders ☞ C10 to C12 Applicable Internal Holders ☞ E15, E23 to E25

Multi-Cornered One-Use type / Negative (With Hole)

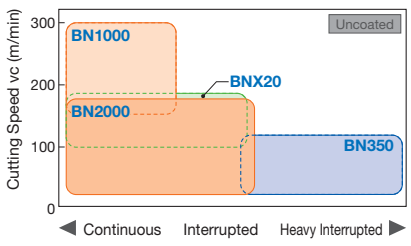
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-CNGA 120404	1	2	0.4	2.5			●	●	●				●		—
		120408			0.8	2.4			●	●	●				●		—
		120412			1.2	2.3			●	●	●						—
		120416*			1.6	3.3				●	●	●		●	●		—
		120420*			2.0	3.2				●	●	●		●	●		—
		120424*			2.4	3.1				●	●	●		●	●		—
	Standard	4NC-CNGA 120402	1	4	0.2	2.5		●	●	●	●						—
		120404			0.4	2.5	●	●	●	●	●	●	●	●	●	●	—
		120408			0.8	2.4	●	●	●	●	●	●	●	●	●	●	—
		120412			1.2	2.3	●	●	●	●	●	●	●	●	●	●	—
		120416*			1.6	3.3		●	●	●	●	●		●	●		—
		120420*			2.0	3.2		●	●	●	●	●		●	●		—
		120424*			2.4	3.1		●	●	●	●	●		●	●		—
	Low Feed Wiper Insert	4NC-CNGA 120404WG	1	4	0.4	2.4	●	●	●	●	●			●	●		—
		120408WG			0.8	2.4	●	●	●	●	●			●	●		—
		120412WG			1.2	2.3		●	●	●	●			●	●		—
	High Feed Wiper Insert	4NC-CNGA 120404WH	1	4	0.4	2.4	●	●	●	●	●			●	●		—
		120408WH			0.8	2.3	●	●	●	●	●			●	●		—
		120412WH			1.2	2.2		●	●	●	●			●	●		—
	Wiper Insert	4NC-CNGA 120404W	1	4	0.4	2.5							●	●	●		—
		120408W			0.8	2.4							●	●	●	●	—
		120412W			1.2	2.3											—
	Finishing Chipbreaker	4NC-CNGG 120404N-FV	1	4	0.4	2.5		●	●	●	●	—	—	●	●		—
		120408N-FV			0.8	2.4		●	●	●	●	—	—	●	●		—
		120412N-FV			1.2	2.3		●	●	●	●	—	—	●	●		—
	Light Cutting Chipbreaker	4NC-CNGG 120404N-LV	1	4	0.4	2.5		●	●	●	●	—	—	●	●		—
		120408N-LV			0.8	2.4		●	●	●	●	—	—	●	●		—
		120412N-LV			1.2	2.3		●	●	●	●	—	—	●	●		—
	Carburised Layer Removal Chipbreaker	4NC-CNGG 120404N-SV	1	4	0.4	2.5						—	—				—
		120408N-SV			0.8	2.4		●	●		●	—	—	●	●		—
		120412N-SV			1.2	2.3		●	●		●	—	—	●	●		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

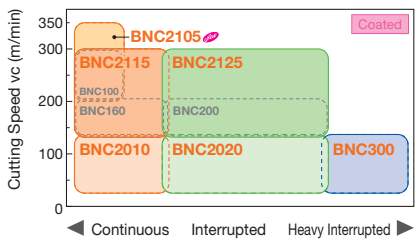
*For use with the SUMIBORON Special Holders for High-Efficiency Machining shown on page L127.

SUMIBORON Application Range Map

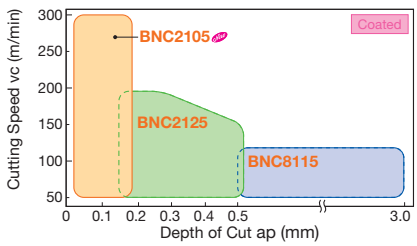
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



C 80° Diamond type

CNG■1204●● Coated

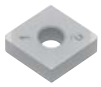
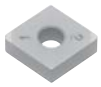
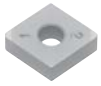
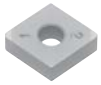
Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

Applicable External Holders ☞ C10 to C12 Applicable Internal Holders ☞ E15, E23 to E25

Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	L Low Resistance E With Honing	2NC-CNGA 120404LE	1	2	0.4	2.5	—	—	—	●	—	—	—	—	—	—	—
		120408LE			0.8	2.4	—	—	—	●	—	—	—	—	—	—	—
		120412LE			1.2	2.3	—	—	—	●	—	—	—	—	—	—	—
	L Low Resistance T Negative Land	2NC-CNGA 120402LT	1	2	0.2	2.5	—	—	—	—	●	—	—	—	—	—	—
		120404LT			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—
		120408LT			0.8	2.4	—	—	—	—	●	—	—	—	—	—	—
		120412LT			1.2	2.3	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NC-CNGA 120402LS	1	2	0.2	2.5			●	—	—					—	—
		120404LS			0.4	2.5	●	●	●	—	—	●				—	—
		120408LS			0.8	2.4	●	●	●	—	—	●				—	—
		120412LS			1.2	2.3	●	●	●	—	—	●				—	—
	L Low Resistance S Negative Land With Honing	4NC-CNGA 120404LS	1	4	0.4	2.5	—	—	—	—	—		●	●	●	—	—
		120408LS			0.8	2.4	—	—	—	—	—		●	●	●	—	—
		120412LS			1.2	2.3	—	—	—	—	—		●	●	●	—	—
	H Strong Edge S Negative Land With Honing	4NC-CNGA 120404HS	1	4	0.4	2.5	—	●	●	●	●	●	—	●	●	●	—
		120408HS			0.8	2.4	—	●	●	●	●	●	—	●	●	●	—
		120412HS			1.2	2.3	—	●	●	●	●	●	—	●	●	●	—
	E High Efficiency S Negative Land With Honing	4NC-CNGA 120404ES	1	4	0.4	2.5	—	—	—	—	●	—	—	—	—	—	—
		120408ES			0.8	2.4	—	—	—	—	●	—	—	—	—	—	—
		120412ES			1.2	2.3	—	—	—	—	●	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

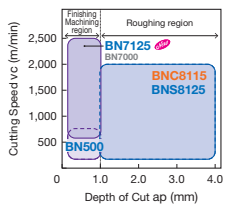
Solid type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	CNGA 120408	1	4	0.8	12.9	—	—	—	—	—	—	—	—	—	—	●
		120412			1.2	12.9	—	—	—	—	—	—	—	—	—	—	●

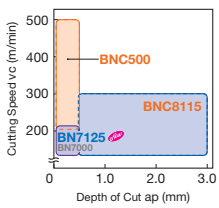
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

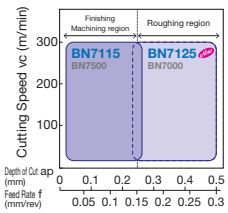
K Gray Cast Iron



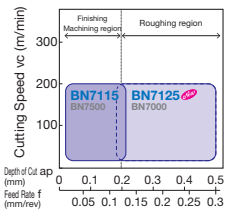
K Ductile Cast Iron



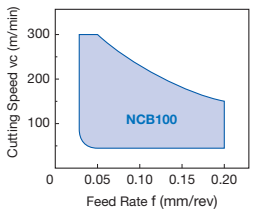
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



SUMIBORON Inserts

C 80° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✲: 2nd Recommendation

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

CNGN0903●● Uncoated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	3.18		

Applicable External Holders ☞ L123

Solid type / Negative (Without Hole)

Uncoated SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**CNGN 090308**	1	4	0.8	9.5	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		090312			1.2	9.4	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	L Low Resistance F Sharp Edge	**CNGN 090308LF**	1	4	0.8	9.5	—	—	—	—	—	—	—	—	—	—	—	—		—
		090312LF			1.2	9.4	—	—	—	—	—	—	—	—	—	—	—	—		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

CNGN0903●● Coated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	3.18		

Applicable External Holders ☞ L123

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

Solid type / Negative (Without Hole)

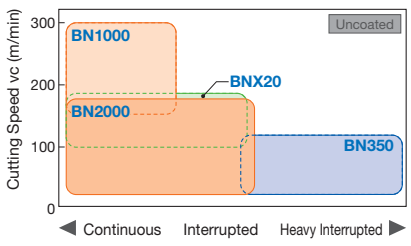
Coated SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**CNGN 090308**	1	4	0.8	9.5	—	—	—	—	—	—	—	—	—	—	●
		090312			1.2	9.4	—	—	—	—	—	—	—	—	—	—	●

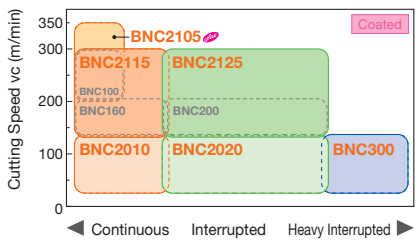
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

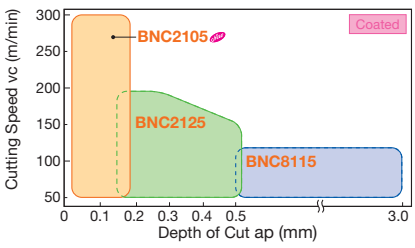
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



C 80° Diamond type

CNG■1204●● Uncoated

Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON												BINDERLESS SUMIBORON
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◕					✖	
S	Exotic Alloy								◕					◔	●
H	Hardened Steel	○	◔	✱	●	◕	✖								
	Sintered Components								◕			●			

Applicable External Holders L123

Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**CNGN 120408**	1	4	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120412			1.2	12.6	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120416			1.6	12.5	—	—	—	—	—	—	—	—	—	—	—	—	●	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

CNG■1204●● Coated

Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	4.76		

Recommended Application		Coated SUMIBORON												
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115		
K	Cast Iron										●	✖		
S	Exotic Alloy													
H	Hardened Steel	○	●	◕	○	◔	✖							
	Sintered Components													

Applicable External Holders L123

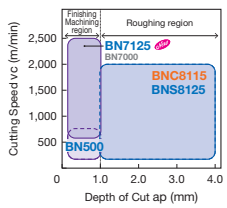
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**CNGN 120408**	1	4	0.8	12.7	—	—	—	—	—	—	—	—	—	—	●
		120412			1.2	12.6	—	—	—	—	—	—	—	—	—	—	●
		120416			1.6	12.5	—	—	—	—	—	—	—	—	—	—	●

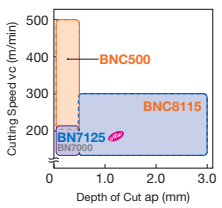
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

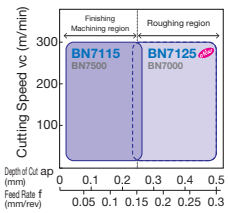
K Gray Cast Iron



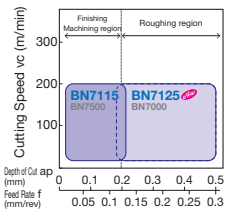
K Ductile Cast Iron



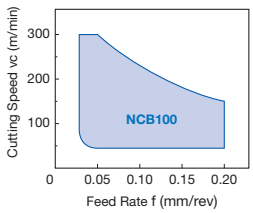
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



C 80° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

CNG■1204●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	4.76		

Applicable External Holders ☞ L123

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●				✱		
S	Exotic Alloy								●				◔	●	
H	Hardened Steel	○	◔	✲	●	●	✱								
	Sintered Components								●			●			

Solid type / Negative (Dimple Lock)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**CNGX 120408**	1	4	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		120412			1.2	12.6	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120416			1.6	12.5	—	—	—	—	—	—	—	—	—	—	—	—	●	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

Cutting Edge Specification Details ☞ L32, L33

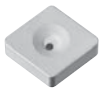
CNG■1204●● Coated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	4.76		

Applicable External Holders ☞ L123

Recommended Application		Coated SUMIBORON									
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✱
S	Exotic Alloy											
H	Hardened Steel	○	●	◔	○	◔	✱					
	Sintered Components											

Solid type / Negative (Dimple Lock)

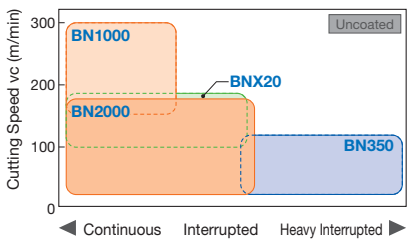
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**CNGX 120408**	1	4	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—
		120412			1.2	12.6	—	—	—	—	—	—	—	—	—	—	●
		120416			1.6	12.5	—	—	—	—	—	—	—	—	—	—	●

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

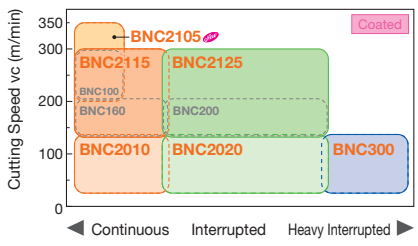
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

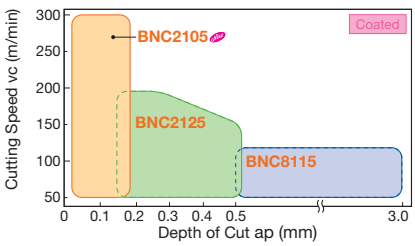
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



C 80° Diamond type

CCEW03X1●● Uncoated

Dimensions (mm)	Inscribed Circle	3.5	Hole Dia.	1.9
	Thickness	1.4		

Applicable Internal Holders E18, E20

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ●: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON												BINDERLESS SUMIBORON
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◔					✖	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✖	●	◔	✖								
	Sintered Components								◔			●			

One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	L Low Resistance F Sharp Edge	**NU-CCEW 03X102LF**	1	1	0.2	1.2	—	—	—	—	—	—	—	○	●		●	●	—	—
		03X104LF			0.4	1.1	—	—	—	—	—	—	—						—	—
	L Low Resistance T Negative Land	**NU-CCEW 03X102LT**	1	1	0.2	1.2	—	●	—	—	—	—	—	—	—	—	—	—	—	—
		03X104LT			0.4	1.1	—	●	—	—	—	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

*Depth of cut for one-use types is 0.5mm or less.

CCEW03X1●● Coated

Dimensions (mm)	Inscribed Circle	3.5	Hole Dia.	1.9
	Thickness	1.4		

Applicable Internal Holders E18, E20

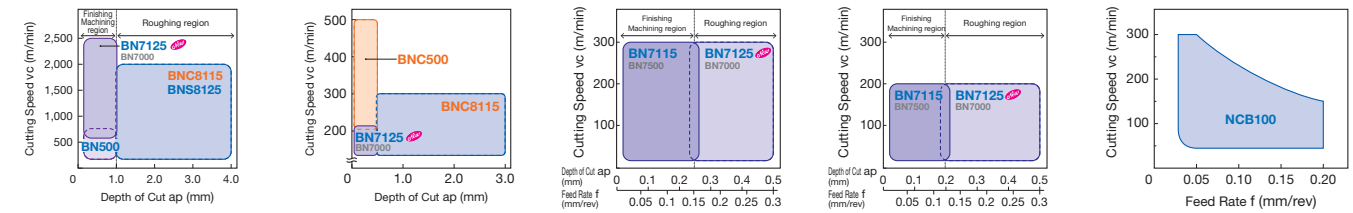
Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◔	○	◔	✖					
	Sintered Components											

One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	L Low Resistance E With Honing	**NC-CCEW 03X102LE**	1	1	0.2	1.2	—	—	—		—	—	—	—	—	—	—
		03X104LE			0.4	1.1	—	—	—		—	—	—	—	—	—	—
	L Low Resistance T Negative Land	**NC-CCEW 03X102LT**	1	1	0.2	1.2	—	—	—	—		—	—	—	—	—	—
		03X104LT			0.4	1.1	—	—	—	—		—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map



○ mark: Stock or planned stock (please confirm stock availability)

C 80° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115 BN7500	BNS8125	NCB100
K	Cast Iron						○	◔				✱	
S	Exotic Alloy							●				◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱						
	Sintered Components							◔			●		

CCEW04X1●● Uncoated

Dimensions (mm)	Inscribed Circle	4.3	Hole Dia.	2.3
	Thickness	1.8		

Applicable Internal Holders E18, E20

One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115 BN7500	BNS8125	NCB100
	L Low Resistance F Sharp Edge	NU-CCEW 04X102LF	1	1	0.2	2.0	—	—	—	—	—	—	○	●			—	—
		04X104LF			0.4	1.9	—	—	—	—	—	—					—	—
	L Low Resistance T Negative Land	NU-CCEW 04X102LT	1	1	0.2	2.0	—	●	—	—		—	—	—	—	—	—	—
		04X104LT			0.4	1.9	—	●	—	—		—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

*Depth of cut for one-use types is 0.5mm or less.

CCEW04X1●● Coated

Dimensions (mm)	Inscribed Circle	4.3	Hole Dia.	2.3
	Thickness	1.8		

Applicable Internal Holders E18, E20

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✱
S	Exotic Alloy											
H	Hardened Steel	○	●	◔	○	◔	✱					
	Sintered Components											

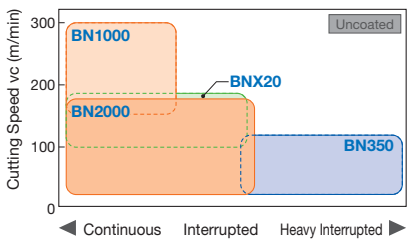
One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	L Low Resistance E With Honing	NC-CCEW 04X102LE	1	1	0.2	2.0	—	—	—		—	—	—	—	—	—	—
		04X104LE			0.4	1.9	—	—	—		—	—	—	—	—	—	—
	L Low Resistance T Negative Land	NC-CCEW 04X102LT	1	1	0.2	2.0	—	—	—	—		—	—	—	—	—	—
		04X104LT			0.4	1.9	—	—	—	—		—	—	—	—	—	—

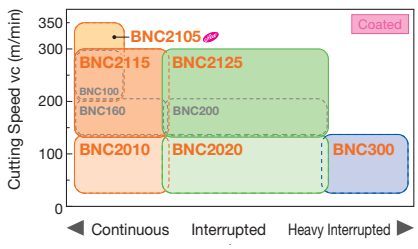
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

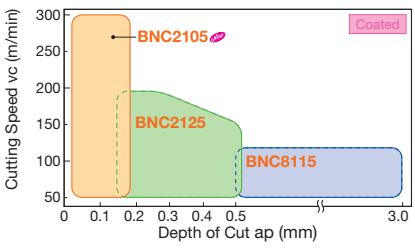
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability)

SUMIBORON Inserts

C 80° Diamond type

CCG■0602●● Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	2.38		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON												BINDERLESS SUMIBORON
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◔					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✱	●	◔	✖								
	Sintered Components								◔				●		

Applicable External Holders C13, D13, D17, D22, D23 Applicable Internal Holders E18 to E20

One-Use type / 7° Positive (With Hole)

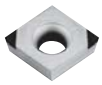
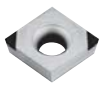
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-CCGW 060202**	1	1	0.2	2.5				●	●								—	
		060204			0.4	2.5*				●	●				●	▲			—	●
		060208			0.8	2.4					●								—	
		T-NU-CCGW 060202	10	1	0.2	2.5					●								—	—
		060204			0.4	2.5					●								—	—
		060208			0.8	2.4													—	—
	L Low Resistance T Negative Land	**NU-CCGW 060202LT**	1	1	0.2	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		060204LT			0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		060208LT			0.8	2.4	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-CCGW 060202HS**	1	1	0.2	2.5	—	—	—	—	●	—	—						—	—
		060204HS			0.4	2.5	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-CCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

*NCB100 cutting edge length is 2.3.

Multi-Cornered One-Use type / 7° Positive (With Hole)

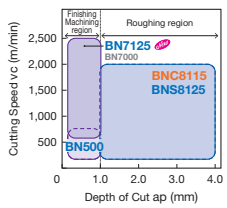
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-CCGW 060202** New	1	2	0.2	2.5								○					—	
		060204			0.4	2.5								○	●		●	●	—	
	Finishing Chipbreaker	**2NU-CCGT 060204N-FV**	1	2	0.4	2.3	—	—	—		●	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

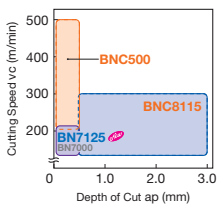
Use 2NS type (2NS-CCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

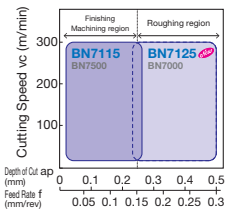
K Gray Cast Iron



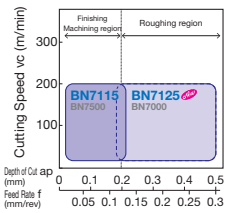
K Ductile Cast Iron



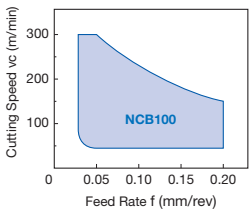
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

C 80° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◔: 1st Recommendation ◷: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Coated SUMIBORON
K	Cast Iron	● ✱
S	Exotic Alloy	
H	Hardened Steel	○ ● ◔ ○ ◷ ✱
	Sintered Components	

CCG■0602●● Coated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	2.38		

Applicable External Holders ☞ C13, D13, D17, D22, D23
Applicable Internal Holders ☞ E18 to E20

Multi-Cornered One-Use type / 7° Positive (With Hole)

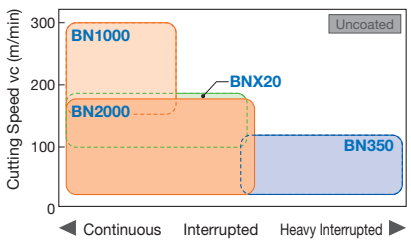
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-CCGW 060202	1	2	0.2	2.4	●	●	●	●	●				●	●	—
		060204			0.4	2.3	●	●	●	●	●				●	●	—
		060208			0.8	2.3		●	●							●	—
	Finishing Chipbreaker	2NC-CCGT 060204N-FV	1	2	0.4	2.3		●	●	●	●	—	—	●	●		—
	L Low Resistance E With Honing	2NC-CCGW 060202LE	1	2	0.2	2.4	—	—	—	●	—	—	—	—	—	—	—
		060204LE			0.4	2.3	—	—	—	●	—	—	—	—	—	—	—
	L Low Resistance T Negative Land	2NC-CCGW 060202LT	1	2	0.2	2.4	—	—	—	—	●	—	—	—	—	—	—
		060204LT			0.4	2.3	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NC-CCGW 060202LS	1	2	0.2	2.4		●	●	—	—				●	—	—
		060204LS			0.4	2.3		●	●	—	—				●	—	—
		060208LS			0.8	2.3		●	●	—	—					—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

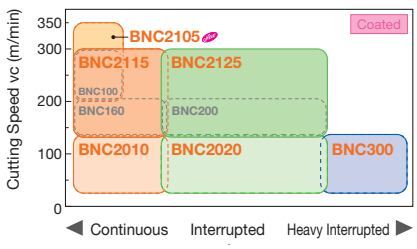
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

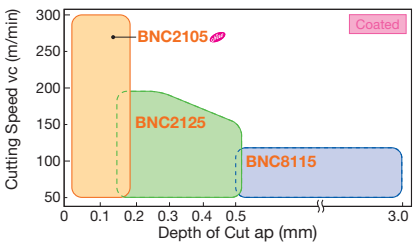
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



SUMIBORON Inserts

C 80° Diamond type

CCG■09T3●● Uncoated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application														
K	Cast Iron							○	◕				✱	
S	Exotic Alloy								●				◕	●
H	Hardened Steel	○	◔	✲	●	◕	✱							
	Sintered Components								◕		●			

One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
							Uncoated SUMIBORON												BINDERLESS SUMIBORON	
	Standard	**NU-CCGW 09T302**	1	1	0.2	2.5				●	●								—	
		09T304			0.4	2.5				●	●				●	▲			—	●
		09T308			0.8	2.4					●								—	●
		T-NU-CCGW 09T302	10	1	0.2	2.5					●								—	—
		09T304			0.4	2.5					●								—	—
		09T308			0.8	2.4													—	—
	L Low Resistance T Negative Land	**NU-CCGW 09T302LT**	1	1	0.2	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		09T304LT			0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		09T308LT			0.8	2.4	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-CCGW 09T302HS**	1	1	0.2	2.5	—	—	—	—	●	—	—						—	—
		09T304HS			0.4	2.5	—	—	—	—	●	—	—						—	—
		09T308HS			0.8	2.4	—	—	—	—	●	—	—						—	—

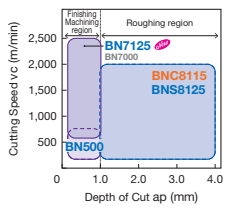
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

*Use NS type (NS-CCGW) for BNX25.

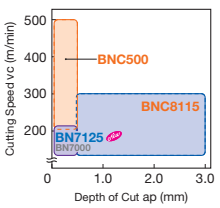
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

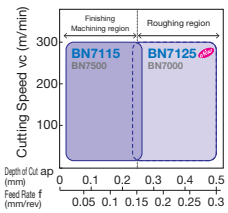
K Gray Cast Iron



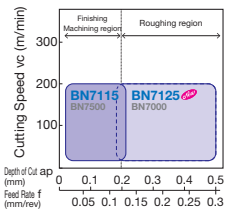
K Ductile Cast Iron



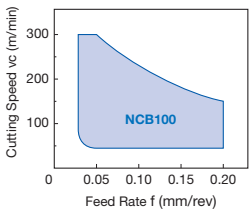
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

C 80° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

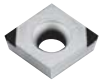
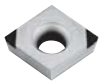
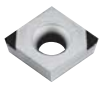
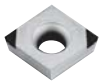
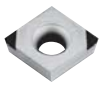
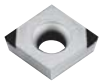
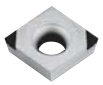
Recommended Application		
K	Cast Iron	○ ● ✱ ✲
S	Exotic Alloy	● ✱ ● ●
H	Hardened Steel	○ ◔ ✲ ● ● ✱
	Sintered Components	● ●

CCG■09T3●● Uncoated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

Applicable External Holders ☞ C13, D13, D17, D22, D23
Applicable Internal Holders ☞ E12, E18 to E20

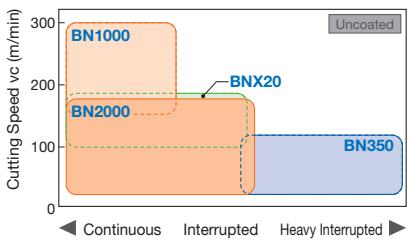
Multi-Cornered One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
							Uncoated SUMIBORON												BINDERLESS SUMIBORON	
	Standard	2NU-CCGW 09T302 New	1	2	0.2	2.5								○					—	
		09T304			0.4	2.5								○	●		●	●	—	
		09T308			0.8	2.4								○	●		●	●	—	
	Low Feed Wiper Insert	2NU-CCGW 09T304WG	1	2	0.4	2.4			—		●								—	
		09T308WG			0.8	2.4			—		●								—	
	High Feed Wiper Insert	2NU-CCGW 09T304WH	1	2	0.4	2.4			—		●								—	
		09T308WH			0.8	2.3			—		●								—	
	Finishing Chipbreaker	2NU-CCGT 09T304N-FV	1	2	0.4	2.4	—	—	—		●	—	—	—	—	—	—	—	—	—
		09T308N-FV			0.8	2.3	—	—	—		●	—	—	—	—	—	—	—	—	—
	Light Cutting Chipbreaker	2NU-CCGT 09T304N-LV	1	2	0.4	2.4	—	—	—		●	—	—	—	—	—	—	—	—	—
		09T308N-LV			0.8	2.3	—	—	—		●	—	—	—	—	—	—	—	—	—
	L Low Resistance F Sharp Edge	2NU-CCGW 09T302LF New	1	2	0.2	2.5	—	—	—	—	—	—	—	○					—	—
		09T304LF New			0.4	2.5	—	—	—	—	—	—	—	○					—	—
		09T308LF New			0.8	2.4	—	—	—	—	—	—	—	○					—	—
	L Low Resistance E With Honing	2NU-CCGW 09T302LE New	1	2	0.2	2.5	—	—	—	—	—	—	—	○	—	—			—	—
		09T304LE New			0.4	2.5	—	—	—	—	—	—	—	○	—	—			—	—
		09T308LE New			0.8	2.4	—	—	—	—	—	—	—	○	—	—			—	—

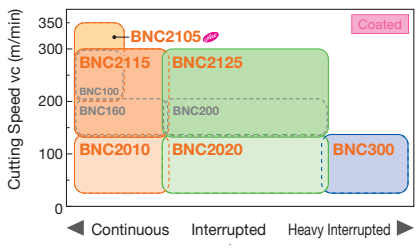
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33
*Use NS type (NS-CCGW) for BNX25.
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

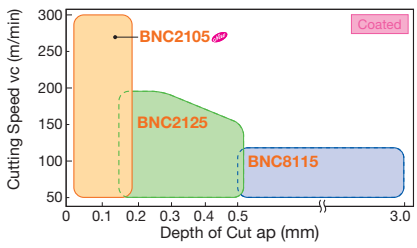
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability)

C 80° Diamond type

CCG■09T3●● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

Applicable External Holders ☞ C13, D13, D17, D22, D23 Applicable Internal Holders ☞ E12, E18 to E20

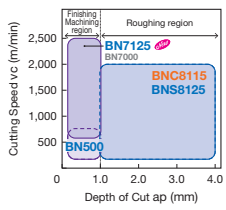
Multi-Cornered One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-CCGW 09T302	1	2	0.2	2.5		●	●	●	●			●	●	●	—
		09T304			0.4	2.5	●	●	●	●	●	●	●	●	●	●	—
		09T308			0.8	2.4	●	●	●	●	●	●	●	●	●	●	—
	Low Feed Wiper Insert	2NC-CCGW 09T304WG	1	2	0.4	2.4		●	●	●	●			●	●		—
		09T308WG			0.8	2.4		●	●	●	●			●	●		—
	High Feed Wiper Insert	2NC-CCGW 09T304WH	1	2	0.4	2.4		●	●	●	●			●	●		—
		09T308WH			0.8	2.3		●	●	●	●			●	●		—
	Finishing Chipbreaker	2NC-CCGT 09T304N-FV	1	2	0.4	2.4		●	●	●	●	—	—	●	●		—
		09T308N-FV			0.8	2.3		●	●	●	●	—	—	●	●		—
	Light Cutting Chipbreaker	2NC-CCGT 09T304N-LV	1	2	0.4	2.4		●	●	●	●	—	—	●	●		—
		09T308N-LV			0.8	2.3		●	●	●	●	—	—	●	●		—
	L Low Resistance E With Honing	2NC-CCGW 09T302LE	1	2	0.2	2.5	—	—	—	●	—	—	—	—	—	—	—
		09T304LE			0.4	2.5	—	—	—	●	—	—	—	—	—	—	—
		09T308LE			0.8	2.4	—	—	—	●	—	—	—	—	—	—	—

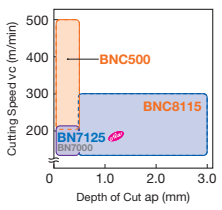
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

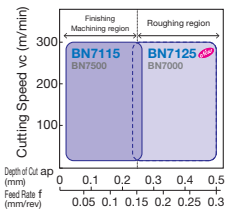
K Gray Cast Iron



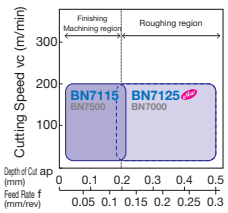
K Ductile Cast Iron



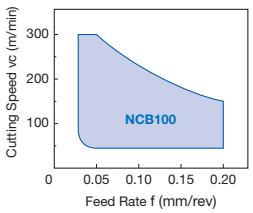
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



C 80° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

CCG■09T3●● Coated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Coated SUMIBORON									
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✱
S	Exotic Alloy											
H	Hardened Steel	○	●	◔	○	◔	✱					
	Sintered Components											

Applicable External Holders ☞ C13, D13, D17, D22, D23
Applicable Internal Holders ☞ E12, E18 to E20

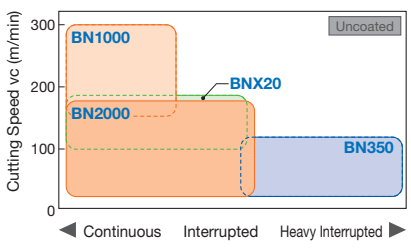
Multi-Cornered One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	L Low Resistance T Negative Land	2NC-CCGW 09T302LT	1	2	0.2	2.5	—	—	—	—	●	—	—	—	—	—	—
		09T304LT			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—
		09T308LT			0.8	2.4	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NC-CCGW 09T302LS	1	2	0.2	2.5		●	●	—	—			●	●	—	—
		09T304LS			0.4	2.5	●	●	●	—	—	●	●	●	●	—	—
		09T308LS			0.8	2.4	●	●	●	—	—	●	●	●	●	—	—
	H Strong Edge S Negative Land With Honing	2NC-CCGW 09T304HS	1	2	0.4	2.5	—					●	—				—
		09T308HS			0.8	2.4	—					●	—				—

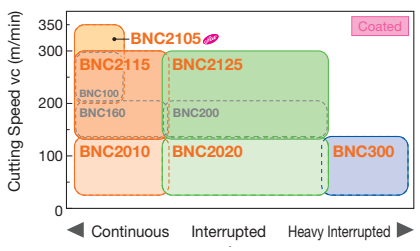
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

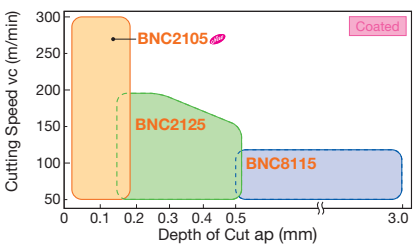
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

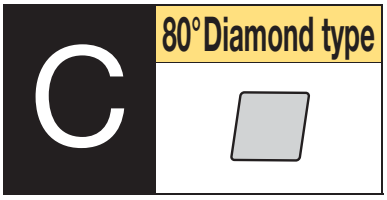


H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)





CCGN0401 ● ● Uncoated

Dimensions (mm)				
	Inscribed Circle	4.76	Hole Dia.	-
	Thickness	1.59		

Applicable Holder: Special Holder

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		
	K	Cast Iron
	S	Exotic Alloy
	H	Hardened Steel
		Sintered Components

One-Use type / 7° Positive (Without Hole)

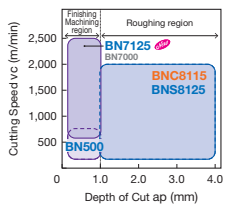
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-CCGN 040104**	1	1	0.4	2.5					●								—	
		040108			0.8	2.4					●								—	
		T-NU-CCGN 040104	10	1	0.4	2.5					●								—	—
		040108			0.8	2.4					●								—	—
	H Strong Edge S Negative Land With Honing	**NU-CCGN 040104HS**	1	1	0.4	2.5	—	—	—	—	●	—	—						—	—
		040108HS			0.8	2.4	—	—	—	—	●	—	—						—	—

Uncoated SUMIBORON / BINDERLESS SUMIBORON

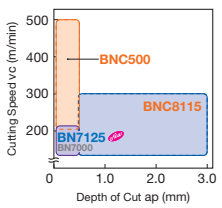
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33
*Use NS type (NS-CCGN) for BNX25.
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

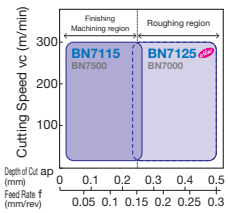
K Gray Cast Iron



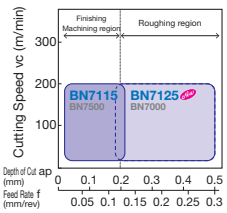
K Ductile Cast Iron



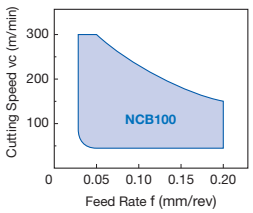
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



C 80° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	●	✱								
	Sintered Components								●			●			

CPGW0802●● Uncoated

Dimensions (mm)	Inscribed Circle	7.94	Hole Dia.	3.4
	Thickness	2.38		

Applicable Internal Holders E21, E22

One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-CPGW 080202**	1	1	0.2	2.5					●								—	
		080204			0.4	2.5				●	●								—	
		080208			0.8	2.4					●								—	
	L Low Resistance T Negative Land	**NU-CPGW 080204LT**	1	1	0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-CPGW 080202HS**	1	1	0.2	2.5	—	—	—	—	●	—	—						—	—
		080204HS			0.4	2.5	—	—	—	—	●	—	—						—	—
		080208HS			0.8	2.4	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-CPGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

CPGW0802●● Coated

Dimensions (mm)	Inscribed Circle	7.94	Hole Dia.	3.4
	Thickness	2.38		

Applicable Internal Holders E21, E22

Recommended Application		Coated SUMIBORON											
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115	
K	Cast Iron										●	✱	
S	Exotic Alloy												
H	Hardened Steel	○	●	●	○	◔	✱						
	Sintered Components												

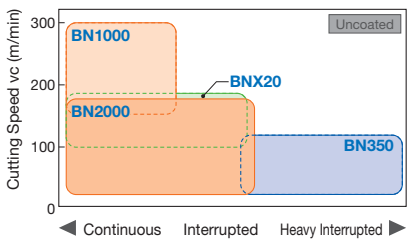
Multi-Cornered One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**2NC-CPGW 080202**	1	2	0.2	2.5				●	●						—
		080204			0.4	2.5				●	●						—

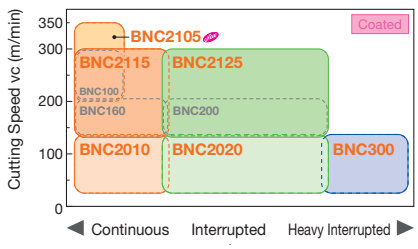
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

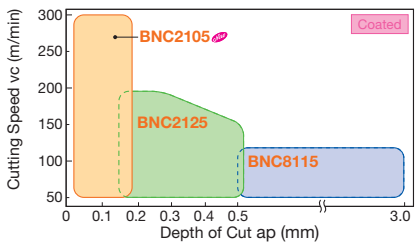
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



C 80° Diamond type

CPGW0903 ● ● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.18		

Applicable Internal Holders E12, E21, E22

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON												BINDERLESS SUMIBORON
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◔					✖	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✖	●	◔	✖								
	Sintered Components								◔			●			

One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-CPGW 090302**	1	1	0.2	2.5				●	●								—	
		090304			0.4	2.5				●	●								—	
		090308			0.8	2.4				●	●								—	
	L Low Resistance T Negative Land	**NU-CPGW 090302LT**	1	1	0.2	2.5	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		090304LT			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		090308LT			0.8	2.4	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-CPGW 090302HS**	1	1	0.2	2.5	—	—	—	—	●	—	—						—	—
		090304HS			0.4	2.5	—	—	—	—	●	—	—						—	—
		090308HS			0.8	2.4	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-CPGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

CPGW0903 ● ● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.18		

Applicable Internal Holders E12, E21, E22

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◔	○	◔	✖					
	Sintered Components											

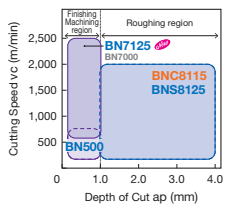
Multi-Cornered One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**2NC-CPGW 090302**	1	2	0.2	2.5				●	●						—
		090304			0.4	2.5				●	●						—

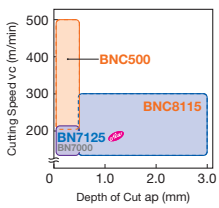
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

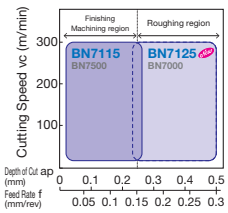
K Gray Cast Iron



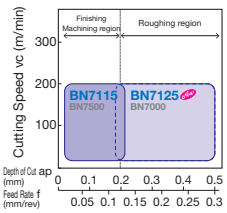
K Ductile Cast Iron



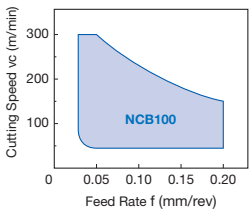
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



D 55° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Coated SUMIBORON									
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✱
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✱					
	Sintered Components											

DNGA1104●● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders C16 Applicable Internal Holders E32, E33

Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**2NC-DNGA 110404**	1	2	0.4	2.5		●	●	●	●						—
		110408			0.8	2.1		●	●	●	●						—
		110412			1.2	2.0		●	●	●	●						—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

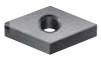
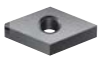
DN■■1504●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders C14 to C16 Applicable Internal Holders E15, E31 to E33

Recommended Application		Uncoated SUMIBORON												BINDERLESS SUMIBORON
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◕					✱	
S	Exotic Alloy								●					◕	●
H	Hardened Steel	○	◔	✲	●	◕	✱								
	Sintered Components								◕			●			

One-Use type / Negative (With Hole)

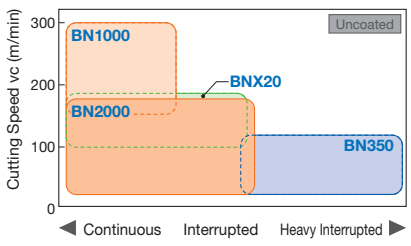
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-DNMA 150401**	1	1	0.1	2.7			—		●								—	—
		150402			0.2	2.5			—		●								—	—
		150404			0.4	2.5	●	●	—	●	●	●	●		●	▲			—	—
		150408			0.8	2.1	●	●	—	●	●	●	●		●	▲			—	—
		150412			1.2	2.0			—		●		●		●	▲			—	—
		T-NU-DNMA 150401	10	1	0.1	2.7			—										—	—
		150402			0.2	2.5			—										—	—
		150404			0.4	2.5	●	●	—	●	●	●	●						—	—
		150408			0.8	2.1	●	●	—	●	●	●	●						—	—
		150412			1.2	2.0			—				●						—	—
	Standard	**NS-DNMA 150404**	1	1	0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		150408			0.8	2.1	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		150412			1.2	2.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
		T-NS-DNMA 150404	10	1	0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		150408			0.8	2.1	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		150412			1.2	2.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

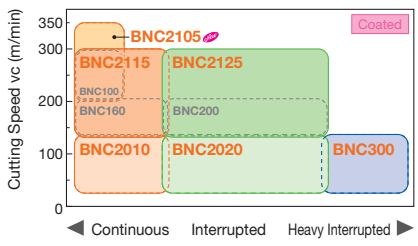
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

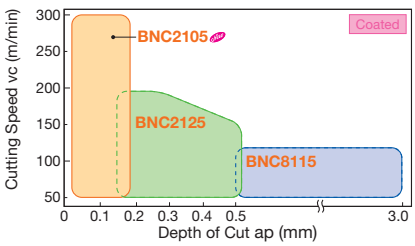
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

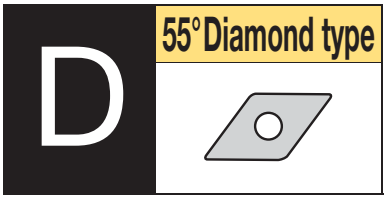


H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts



DN■■1504●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

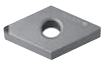
(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application

K	Cast Iron							○	◕				✖	
S	Exotic Alloy								●				◕	●
H	Hardened Steel	○	◔	✪	●	◕	✖							
	Sintered Components								◕			●		

Applicable External Holders ☞ C14 to C16 Applicable Internal Holders ☞ E15, E31 to E33

One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-DNGA 150404**	1	1	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—	●
		150408			0.8	2.1	—	—	—	—	—	—	—	—	—	—	—	—	—	●
		150412			1.2	2.0	—	—	—	—	—	—	—	—	—	—	—	—	—	●

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

*Depth of cut for one-use types is 0.5mm or less.

Multi-Cornered One-Use type / Negative (With Hole)

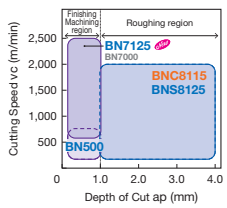
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-DNGA 150404**	1	2	0.4	2.5		●	—	●	●	●		○	●	▲	●	●	—	
		150408			0.8	2.1		●	—	●	●	●		○	●	▲	●	●	—	
		150412			1.2	2.0			—		●			○	●				—	
		T-2NU-DNGA 150404	10	2	0.4	2.5		●	—		●								—	—
		150408			0.8	2.1		●	—		●	●		○	●	▲			—	—
		150412			1.2	2.0			—										—	—
	Standard	**2NS-DNGA 150404**	1	2	0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		150408			0.8	2.1	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		150412			1.2	2.0	—	—		—	—	—	—	—	—	—	—	—	—	—
		T-2NS-DNGA 150404	10	2	0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		150408			0.8	2.1	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		150412			1.2	2.0	—	—		—	—	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

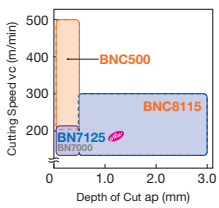
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

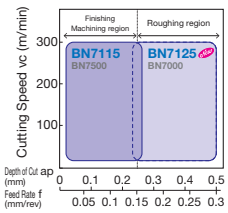
K Gray Cast Iron



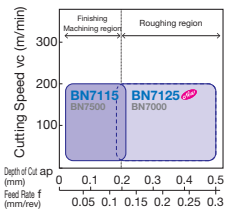
K Ductile Cast Iron



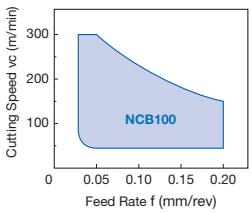
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

D 55° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application													
K	Cast Iron							○	●			✱	
S	Exotic Alloy								●			●	●
H	Hardened Steel	○	◔	✲	●	●	✱						
	Sintered Components								●		●		

DN■■1504●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders ☞ C14 to C16
Applicable Internal Holders ☞ E15, E31 to E33

Multi-Cornered One-Use type / Negative (With Hole)

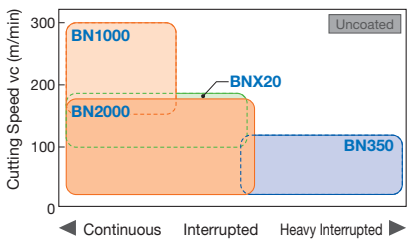
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
							Uncoated SUMIBORON												BINDERLESS SUMIBORON	
	Low Feed Wiper Insert	2NU-DNGA 150404WG	1	2	0.4	2.3			—		●								—	
		150408WG			0.8	2.0			—		●								—	
	High Feed Wiper Insert	2NU-DNGA 150404WH	1	2	0.4	2.1			—		●								—	
		150408WH			0.8	1.8			—		●								—	
	Light Cutting Chipbreaker	2NU-DNGM 150404N-LV	1	2	0.4	2.5	—	—	—		●	—	—	—	—	—	—	—	—	—
		150408N-LV			0.8	2.1	—	—	—		●	—	—	—	—	—	—	—	—	—
		150412N-LV			1.2	2.0	—	—	—		●	—	—	—	—	—	—	—	—	—
	L Low Resistance F Sharp Edge	2NU-DNGA 150404LF	1	2	0.4	2.5	—	—	—	—	—	—	—	○	●	▲			—	—
		150408LF			0.8	2.1	—	—	—	—	—	—	—	○	●	▲			—	—
		150412LF			1.2	2.0	—	—	—	—	—	—	—	—	—	—			—	—
	L Low Resistance E With Honing	2NU-DNGA 150404LE New	1	2	0.4	2.5	—	—	—	—	—	—	—	○	—	—			—	—
		150408LE New			0.8	2.1	—	—	—	—	—	—	—	○	—	—			—	—
	L Low Resistance T Negative Land	2NU-DNGA 150404LT	1	2	0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		150408LT			0.8	2.1	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		150412LT			1.2	2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge T Negative Land	2NU-DNGA 150404HT	1	2	0.4	2.5	—	—	—	—	—	●	—	—	—	—	—	—	—	—
		150408HT			0.8	2.1	—	—	—	—	—	●	—	—	—	—	—	—	—	—
		150412HT			1.2	2.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	2NU-DNGA 150404HS	1	2	0.4	2.5	—	—	—	—	●	—	—	○	●	▲			—	—
		150408HS			0.8	2.1	—	—	—	—	●	—	—	○	●	▲			—	—
		150412HS			1.2	2.0	—	—	—	—	●	—	—	—	—	—			—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

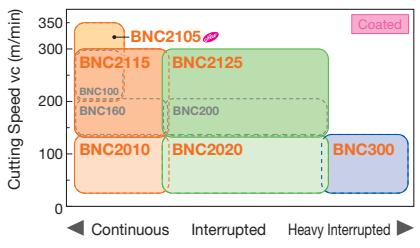
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

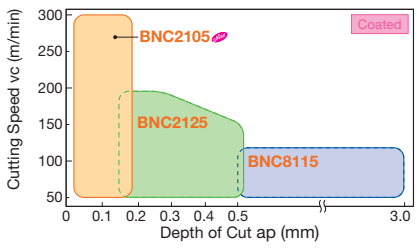
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts

DN■■1504●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ●: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	K Cast Iron							○	◔					✖	
	S Exotic Alloy							●						◔	●
	H Hardened Steel	○	◔	✖	●	◔	✖								
	Sintered Components							◔				●			

Uncoated SUMIBORON

BINDERLESS SUMIBORON

Applicable External Holders C14 to C16 Applicable Internal Holders E15, E31 to E33

Negative type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**DNMA 150404**	1	1	0.4	5.0		●			●				●	▲			—	—
		150408			0.8	4.7		●			●		●		●	▲			—	—
		150412			1.2	4.3					●				●	▲			—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

DNG■■1504●● Coated

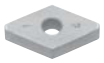
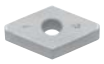
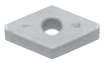
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Recommended Application		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	K Cast Iron										●	✖
	S Exotic Alloy											
	H Hardened Steel	○	●	◔	○	◔	✖					
	Sintered Components											

Coated SUMIBORON

Applicable External Holders C14 to C16 Applicable Internal Holders E15, E31 to E33

Multi-Cornered One-Use type / Negative (With Hole)

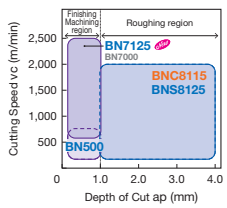
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**2NC-DNGA 150404**	1	2	0.4	2.5			●	●	●				●		—
		150408			0.8	2.1			●	●	●				●		—
		150412			1.2	2.0			●	●	●						—
		150416[*1]			1.6	3.4				●	●	●		●	●		—
		150420[*1]			2.0	3.0				●	●	●		●	●		—
		150424[*1]			2.4	2.7				●	●	●		●	●		—
	Standard	**4NC-DNGA 150402**	1	4	0.2	2.6		●	●	●	●						—
		150404			0.4	2.5	●	●	●	●	●	●	●	●	●	●	—
		150408			0.8	2.1	●	●	●	●	●	●	●	●	●	●	—
		150412			1.2	2.0		●	●	●	●	●		●	●	●	—
		150416[*1]			1.6	3.4		●	●	●	●	●		●	●		—
		150420[*1]			2.0	3.0		●	●	●	●	●		●	●		—
		150424[*1]			2.4	2.7		●	●	●	●	●		●	●		—
	Low Feed Wiper Insert	**4NC-DNGA 150404WG**[*2]	1	4	0.4	2.3		●	●	●	●			●	●		—
		150408WG[*2]			0.8	2.0		●	●	●	●			●	●		—
	High Feed Wiper Insert	**4NC-DNGA 150404WH**[*2]	1	4	0.4	2.1		●	●	●	●			●	●		—
		150408WH[*2]			0.8	1.8		●	●	●	●			●	●		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

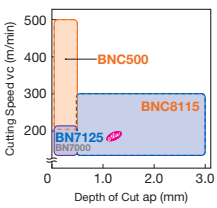
*1: For use with the SUMIBORON Special Holders for High-Efficiency Machining shown on pages L127 and L128. *2: Use a holder with a cutting edge angle of 93°.

SUMIBORON Application Range Map

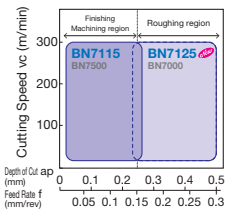
K Gray Cast Iron



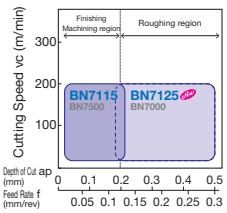
K Ductile Cast Iron



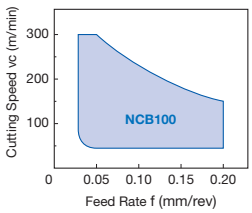
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

D 55° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

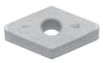
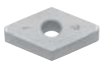
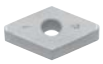
Recommended Application		Coated SUMIBORON									
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC500	BNC8115
K	Cast Iron		●	●	●	●	—	—	●	●	—
S	Exotic Alloy		●	●	●	●	—	—	●	●	—
H	Hardened Steel		●	●	◔	○	◔	✱			
	Sintered Components										

DNG■1504●● Coated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders ☞ C14 to C16
Applicable Internal Holders ☞ E15, E31 to E33

Multi-Cornered One-Use type / Negative (With Hole)

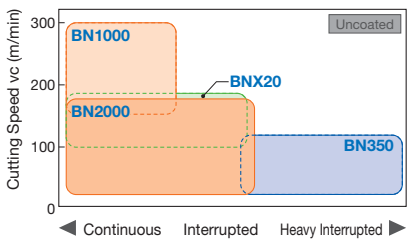
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Finishing Chipbreaker	4NC-DNGG 150404N-FV	1	4	0.4	2.5		●	●	●	●	—	—	●	●		—
		150408N-FV			0.8	2.1		●	●	●	●	—	—	●	●		—
		150412N-FV			1.2	2.0		●	●	●	●	—	—	●	●		—
	Light Cutting Chipbreaker	4NC-DNGG 150404N-LV	1	4	0.4	2.5		●	●	●	●	—	—	●	●		—
		150408N-LV			0.8	2.1		●	●	●	●	—	—	●	●		—
		150412N-LV			1.2	2.0		●	●	●	●	—	—	●	●		—
	Carburised Layer Removal Chipbreaker	4NC-DNGG 150404N-SV	1	4	0.4	2.5						—	—				—
		150408N-SV			0.8	2.1		●	●	●	●	—	—	●	●		—
		150412N-SV			1.2	2.0		●	●	●	●	—	—	●	●		—
	L Low Resistance E With Honing	2NC-DNGA 150404LE	1	2	0.4	2.5	—	—	—	●	—	—	—	—	—	—	—
		150408LE			0.8	2.1	—	—	—	●	—	—	—	—	—	—	—
		150412LE			1.2	2.0	—	—	—	●	—	—	—	—	—	—	—
	L Low Resistance T Negative Land	2NC-DNGA 150402LT	1	2	0.2	2.6	—	—	—	—	●	—	—	—	—	—	—
		150404LT			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—
		150408LT			0.8	2.1	—	—	—	—	●	—	—	—	—	—	—
		150412LT			1.2	2.0	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NC-DNGA 150402LS	1	2	0.2	2.5			●	—	—					—	—
		150404LS			0.4	2.5	●	●	●	—	—	●				—	—
		150408LS			0.8	2.1	●	●	●	—	—	●				—	—
		150412LS			1.2	2.0	●	●	●	—	—	●				—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

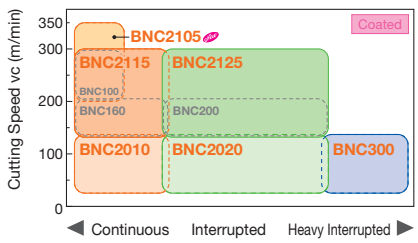
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

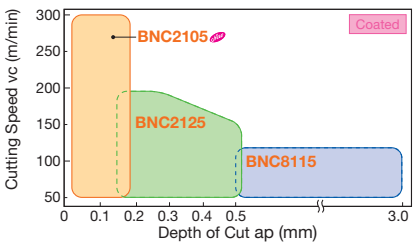
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



D 55° Diamond type

DNG■1504●● Coated

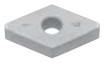
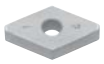
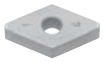
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

Applicable External Holders ☞ C14 to C16
Applicable Internal Holders ☞ E15, E31 to E33

Multi-Cornered One-Use type / Negative (With Hole)

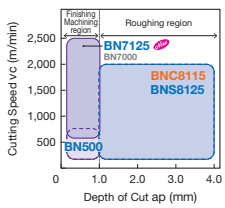
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Unit	Corner Count	Corner Radius	Cutting Edge Length	Coated SUMIBORON: BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	L Low Resistance S Negative Land With Honing	4NC-DNGA 150404LS	1	4	0.4	2.5	—	—	—	—	—		●	●	●	—	—
		150408LS			0.8	2.1	—	—	—	—	—		●	●	●	—	—
		150412LS			1.2	2.0	—	—	—	—	—			●	●	—	—
	H Strong Edge S Negative Land With Honing	4NC-DNGA 150404HS	1	4	0.4	2.5	—	●	●	●	●	●	—	●	●	●	—
		150408HS			0.8	2.1	—	●	●	●	●	●	—	●	●	●	—
		150412HS			1.2	2.0	—	●	●	●	●	●	—	●	●	●	—
	E High Efficiency S Negative Land With Honing	4NC-DNGA 150404ES	1	4	0.4	2.5	—	—	—	—	●	—	—	—	—	—	—
		150408ES			0.8	2.1	—	—	—	—	●	—	—	—	—	—	—
		150412ES			1.2	2.0	—	—	—	—	●	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

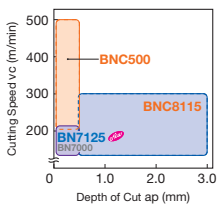
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

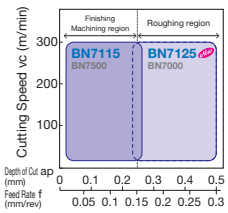
K Gray Cast Iron



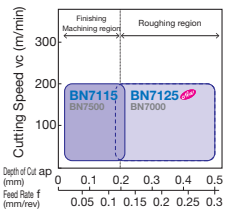
K Ductile Cast Iron



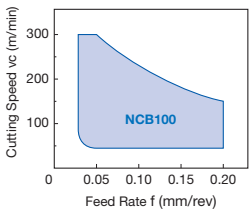
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



D 55° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

DNMA1506●● Uncoated

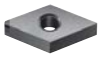
Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	6.35		

Applicable External Holders C14, C16 Applicable Internal Holders E32

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation General machining ●: 1st Recommendation ◔: 2nd Recommendation Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron					○	◔							✱	
S	Exotic Alloy						●							◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components						◔					●			

One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-DNMA 150604**	1	1	0.4	2.5					●								—	—
		150608			0.8	2.1					●								—	—
		150612			1.2	2.0					●								—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-DNMA) for BNX25. Depth of cut for one-use types is 0.5mm or less.

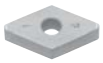
DNGA1506●● Coated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	6.35		

Applicable External Holders C14, C16 Applicable Internal Holders E32

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✱
S	Exotic Alloy											
H	Hardened Steel	○	●	◔	○	◔	✱					
	Sintered Components											

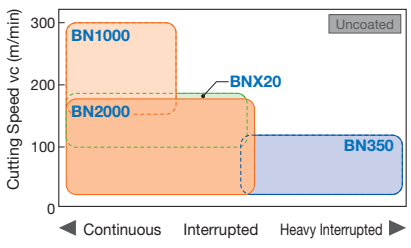
Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**4NC-DNGA 150604**	1	4	0.4	2.5				●	●						—
		150608			0.8	2.1				●	●						—
		150612			1.2	2.0				●	●						—

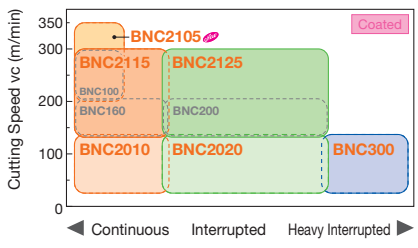
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

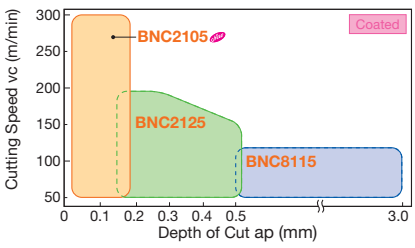
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



D 55° Diamond type

DNGN1103●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		
	K	Cast Iron
	S	Exotic Alloy
	H	Hardened Steel
		Sintered Components

Applicable External Holders L123

Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
							Uncoated SUMIBORON												BINDERLESS SUMIBORON	
	Standard	**DNGN 110308**	1	4	0.8	10.8	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		110312			1.2	10.5	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	L Low Resistance F Sharp Edge	**DNGN 110308LF**	1	4	0.8	10.8	—	—	—	—	—	—	—	—	—	—	—	—		—
		110312LF			1.2	10.5	—	—	—	—	—	—	—	—	—	—	—	—		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

DNGN1103●● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	3.18		

Recommended Application		
	K	Cast Iron
	S	Exotic Alloy
	H	Hardened Steel
		Sintered Components

Applicable External Holders L123

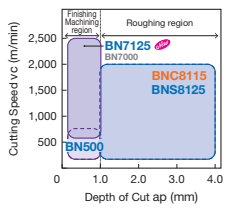
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
							Coated SUMIBORON										
	Standard	**DNGN 110308**	1	4	0.8	10.8	—	—	—	—	—	—	—	—	—	—	●
		110312			1.2	10.5	—	—	—	—	—	—	—	—	—	—	●

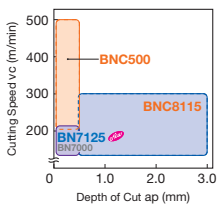
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

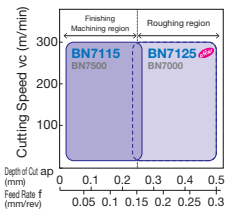
K Gray Cast Iron



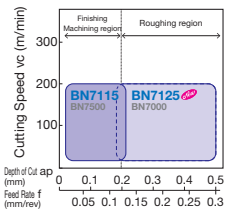
K Ductile Cast Iron



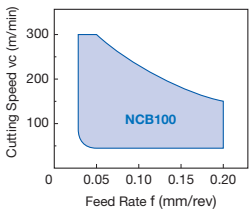
Sintered Alloy General Sintered Alloy



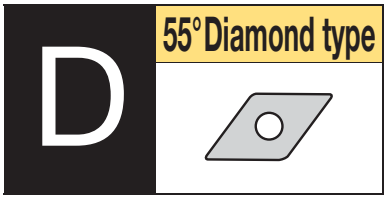
Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



SUMIBORON Inserts



Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application													
K	Cast Iron							○	●			✱	
S	Exotic Alloy								●			◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱						
	Sintered Components								◔		●		

DCG■0702●● Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	2.38		

Applicable External Holders ☞C19, D14, D18, D19, D24, D25

Applicable Internal Holders ☞E16, E26 to E30

One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
							Uncoated SUMIBORON												BINDERLESS SUMIBORON	
	Standard	**NU-DCGW 070202**	1	1	0.2	2.7				●	●								—	
		070204			0.4	2.5				●	●				●	▲			—	●
		070208			0.8	2.1					●								—	
		T-NU-DCGW 070202	10	1	0.2	2.7					●								—	—
		070204			0.4	2.5					●								—	—
		070208			0.8	2.1													—	—
	L Low Resistance T Negative Land	**NU-DCGW 070202LT**	1	1	0.2	2.7	—		—	—	●	—	—	—	—	—	—	—	—	—
		070204LT			0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		070208LT			0.8	2.1	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-DCGW 070202HS**	1	1	0.2	2.7	—	—	—	—	●	—	—						—	—
		070204HS			0.4	2.5	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞L32, L33

Use NS type (NS-DCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

Multi-Cornered One-Use type / 7° Positive (With Hole)

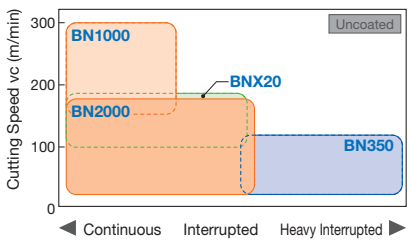
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-DCGW 070202** New	1	2	0.2	2.7								○					—	
		070204			0.4	2.5								○	●		●	●	—	
		070208			0.8	2.1								○	●		●	●	—	
	Finishing Chipbreaker	**2NU-DCGT 070204N-FV**	1	2	0.4	2.4	—	—	—		●	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞L32, L33

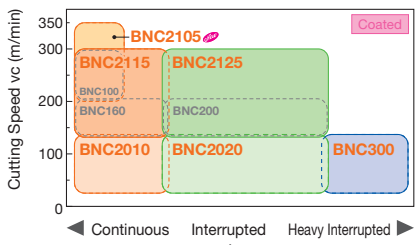
Use 2NS type (2NS-DCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

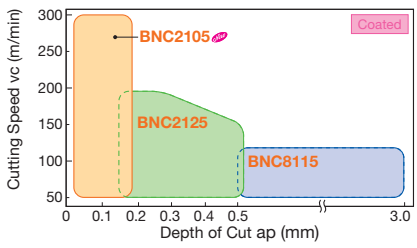
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

D 55° Diamond type

DCG■0702●● Coated

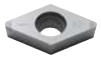
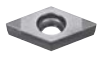
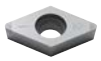
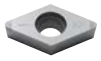
Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	2.38		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

Applicable External Holders C19, D14, D18, D19, D24, D25 Applicable Internal Holders E16, E26 to E30

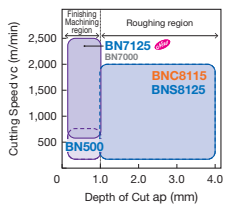
Multi-Cornered One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-DCGW 070202	1	2	0.2	2.6	●	●	●	●	●				●		—
		070204			0.4	2.5	●	●	●	●	●				●	●	—
		070208			0.8	2.1		●	●	●	●						—
	Finishing Chipbreaker	2NC-DCGT 070204N-FV	1	2	0.4	2.4		●	●	●	●	—	—	●	●		—
	L Low Resistance T Negative Land	2NC-DCGW 070202LT	1	2	0.2	2.6	—	—	—	—	●	—	—	—	—	—	—
		070204LT			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NC-DCGW 070202LS	1	2	0.2	2.6		●	●	—	—				●	—	—
		070204LS			0.4	2.5		●	●	—	—				●	—	—
		070208LS			0.8	2.1		●	●	—	—					—	—

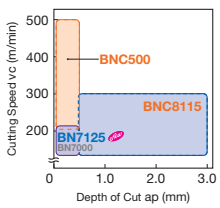
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

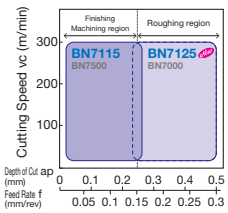
K Gray Cast Iron



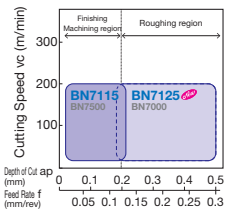
K Ductile Cast Iron



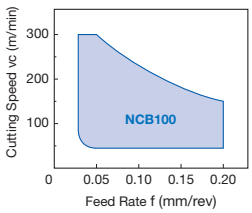
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



D 55° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

DCG■11T3●● Uncoated

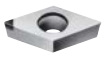
Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application													
K	Cast Iron							○	◔			✱	
S	Exotic Alloy							●				◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱						
	Sintered Components							◔			●		

Applicable External Holders ☞ C19, D14, D24, D25 Applicable Internal Holders ☞ E13, E26 to E30

One-Use type / 7° Positive (With Hole)

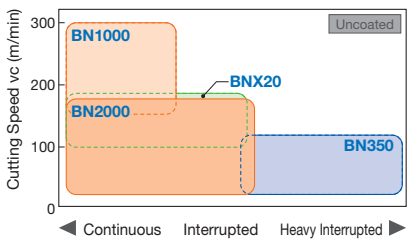
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Uncoated SUMIBORON: BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BINDERLESS SUMIBORON: BNS8125	NCB100
	Standard	**NU-DCGW 11T302**	1	1	0.2	2.7				●	●				●	▲			—	
		11T304			0.4	2.5				●	●				●	▲			—	●
		11T308			0.8	2.1					●								—	●
		11T312			1.2	2.0					●								—	
		T-NU-DCGW 11T302	10	1	0.2	2.7					●								—	—
		T-11T304			0.4	2.5					●								—	—
		T-11T308			0.8	2.1													—	—
		T-11T312			1.2	2.0													—	—
	L Low Resistance F Sharp Edge	**NU-DCGW 11T302LF**	1	1	0.2	2.7	—	—	—	—	—	—	—		●	▲			—	—
		11T304LF			0.4	2.5	—	—	—	—	—	—	—		●	▲			—	—
		11T308LF			0.8	2.1	—	—	—	—	—	—	—						—	—
	L Low Resistance T Negative Land	**NU-DCGW 11T302LT**	1	1	0.2	2.7	—		—	—	●	—	—	—	—	—	—	—	—	—
		11T304LT			0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		11T308LT			0.8	2.1	—		—	—	●	—	—	—	—	—	—	—	—	—
		11T312LT			1.2	2.0	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-DCGW 11T302HS**	1	1	0.2	2.7	—	—	—	—	●	—	—						—	—
		11T304HS			0.4	2.5	—	—	—	—	●	—	—						—	—
		11T308HS			0.8	2.1	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

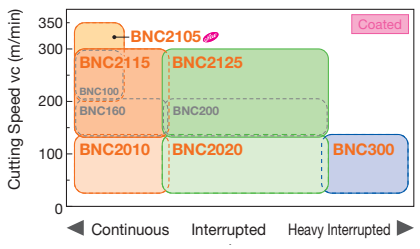
Use NS type (NS-DCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

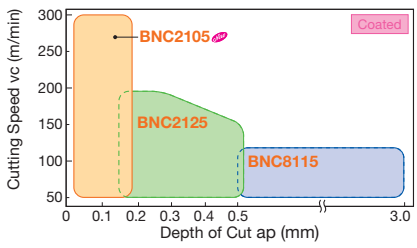
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts

D 55° Diamond type

DCG■11T3●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON												BINDERLESS SUMIBORON
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◕					✖	
S	Exotic Alloy								●					◕	●
H	Hardened Steel	○	◔	✖	●	◕	✖								
	Sintered Components								◕			●			

Applicable External Holders ☞ C19, D14, D18, D19, D24, D25 Applicable Internal Holders ☞ E13, E26 to E30

Multi-Cornered One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-DCGW 11T302**	1	2	0.2	2.7								○	●		●	●	—	
		11T304			0.4	2.5								○	●		●	●	—	
		11T308			0.8	2.1								○	●		●	●	—	
		T-2NU-DCGW 11T302	10	2	0.2	2.7													—	—
		11T304			0.4	2.5											●	●	—	—
		11T308			0.8	2.1													—	—
	Low Feed Wiper Insert	**2NU-DCGW 11T304WG***	1	2	0.4	2.3			—		●								—	
		11T308WG*			0.8	2.1			—		●								—	
	High Feed Wiper Insert	**2NU-DCGW 11T304WH***	1	2	0.4	2.1			—		●								—	
		11T308WH*			0.8	1.8			—		●								—	
	Finishing Chipbreaker	**2NU-DCGT 11T304N-FV**	1	2	0.4	2.4	—	—	—		●	—	—	—	—	—	—	—	—	—
		11T308N-FV			0.8	2.0	—	—	—		●	—	—	—	—	—	—	—	—	—
	Light Cutting Chipbreaker	**2NU-DCGT 11T304N-LV**	1	2	0.4	2.4	—	—	—		●	—	—	—	—	—	—	—	—	—
		11T308N-LV			0.8	2.0	—	—	—		●	—	—	—	—	—	—	—	—	—
	L Low Resistance F Sharp Edge	**2NU-DCGW 11T302LF**	1	2	0.2	2.7	—	—	—	—	—	—	—	○	●		●	●	—	—
		11T304LF			0.4	2.5	—	—	—	—	—	—	—	○	●		●	●	—	—
		11T308LF			0.8	2.1	—	—	—	—	—	—	—	○	●		●	●	—	—
	L Low Resistance E With Honing	**2NU-DCGW 11T302LE**	1	2	0.2	2.7	—	—	—	—	—	—	—	○	—	—	●	●	—	—
		11T304LE			0.4	2.5	—	—	—	—	—	—	—	○	—	—	●	●	—	—
		11T308LE			0.8	2.1	—	—	—	—	—	—	—	○	—	—	●	●	—	—
	L Low Resistance S Negative Land With Honing	**2NU-DCGW 11T302LS**	1	2	0.2	2.7	—	—	—	—	—	—	—	—	—	—	●	●	—	—
		11T304LS			0.4	2.5	—	—	—	—	—	—	—	—	—	—	●	●	—	—
		11T308LS			0.8	2.1	—	—	—	—	—	—	—	—	—	—	●	●	—	—

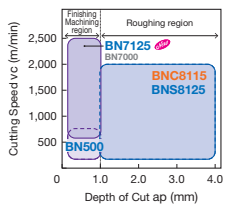
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

Use 2NS type (2NS-DCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

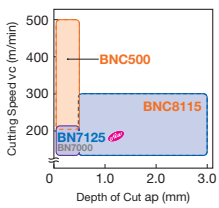
*Use a holder with a cutting edge angle of 93°.

SUMIBORON Application Range Map

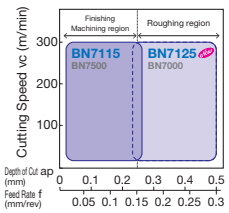
K Gray Cast Iron



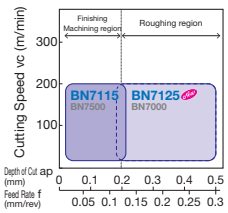
K Ductile Cast Iron



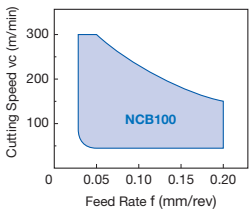
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability)

D 55° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		
K	Cast Iron	● ✱
S	Exotic Alloy	
H	Hardened Steel	○ ● ◕ ○ ◔ ✱
	Sintered Components	

DCG■11T3●● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.97		

Applicable External Holders ☞ C19, D14, D18, D19, D24, D25
Applicable Internal Holders ☞ E13, E26 to E30

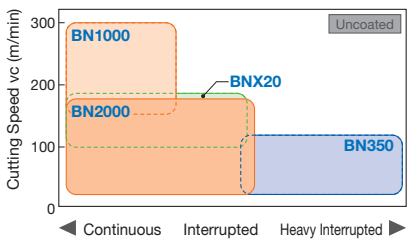
Multi-Cornered One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON: BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**2NC-DCGW 11T302**	1	2	0.2	2.7		●	●	●	●			●	●	●	—
		11T304			0.4	2.5	●	●	●	●	●	●	●	●	●	●	—
		11T308			0.8	2.1	●	●	●	●	●	●	●	●	●	●	—
	Low Feed Wiper Insert	**2NC-DCGW 11T304WG***	1	2	0.4	2.3		●	●	●	●			●	●		—
		11T308WG*			0.8	2.1		●	●	●	●			●	●		—
	High Feed Wiper Insert	**2NC-DCGW 11T304WH***	1	2	0.4	2.1		●	●	●	●			●	●		—
		11T308WH*			0.8	1.8		●	●	●	●			●	●		—
	Finishing Chipbreaker	**2NC-DCGT 11T304N-FV**	1	2	0.4	2.4		●	●	●	●	—	—	●	●		—
		11T308N-FV			0.8	2.0		●	●	●	●	—	—	●	●		—
	Light Cutting Chipbreaker	**2NC-DCGT 11T304N-LV**	1	2	0.4	2.4		●	●	●	●	—	—	●	●		—
		11T308N-LV			0.8	2.0		●	●	●	●	—	—	●	●		—
	L Low Resistance E With Honing	**2NC-DCGW 11T302LE**	1	2	0.2	2.7	—	—	—	●	—	—	—	—	—	—	—
		11T304LE			0.4	2.5	—	—	—	●	—	—	—	—	—	—	—
		11T308LE			0.8	2.1	—	—	—	●	—	—	—	—	—	—	—
	L Low Resistance T Negative Land	**2NC-DCGW 11T302LT**	1	2	0.2	2.7	—	—	—	—	●	—	—	—	—	—	—
		11T304LT			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—
		11T308LT			0.8	2.1	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	**2NC-DCGW 11T302LS**	1	2	0.2	2.7		●	●	—	—			●	●	—	—
		11T304LS			0.4	2.5	●	●	●	—	—	●	●	●	●	—	—
		11T308LS			0.8	2.1	●	●	●	—	—	●	●	●	●	—	—
	H Strong Edge S Negative Land With Honing	**2NC-DCGW 11T304HS**	1	2	0.4	2.5	—					●	—			—	—
		11T308HS			0.8	2.1	—					●	—			—	—

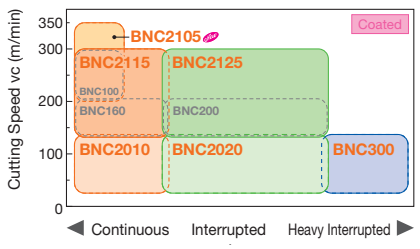
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.
Cutting Edge Specification Details ☞ L32, L33
*Use a holder with a cutting edge angle of 93°.

SUMIBORON Application Range Map

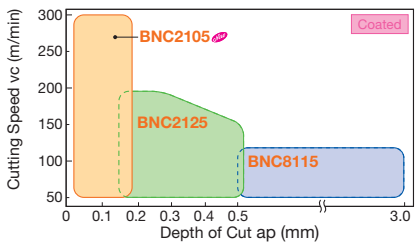
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



SUMIBORON Inserts

R Round type

RNGN●●●●●●● Uncoated

Dimensions (mm)				
	Inscribed Circle	9.525 to 12.7	Hole Dia.	-
	Thickness	3.18 to 4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		
	K	Cast Iron
	S	Exotic Alloy
	H	Hardened Steel
		Sintered Components

Applicable External Holders L124

Negative type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Full-top CBN (Standard)	**RNGN 120400-B**	1	—	12.7								○	●	▲			—	—
	Full-top CBN (Standard)	**RNGN 150400-B**	1	—	15.88								○					—	—

Uncoated SUMIBORON

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

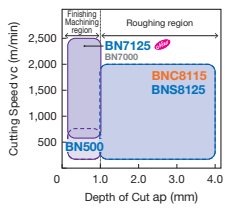
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**RNGN 090300**	1	—	9.5	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	L Low Resistance F Sharp Edge	**RNGN 090300LF**	1	—	9.5	—	—	—	—	—	—	—	—	—	—	—	—		—
	Standard	**RNGN 120300**	1	—	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	L Low Resistance F Sharp Edge	**RNGN 120300LF**	1	—	12.7	—	—	—	—	—	—	—	—	—	—	—	—		—

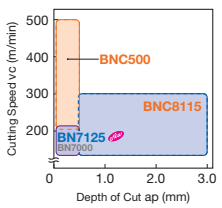
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

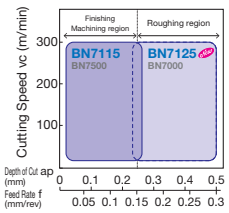
K Gray Cast Iron



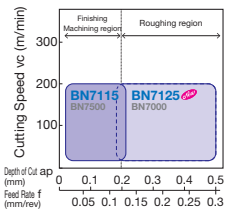
K Ductile Cast Iron



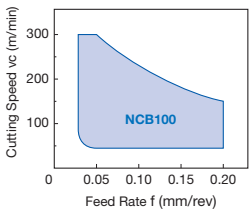
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

R Round type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

RNGN●●●●●● Uncoated

Dimensions (mm)				
	Inscribed Circle	9.525 to 12.7	Hole Dia.	-
	Thickness	3.18 to 4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application													
K	Cast Iron							○	●			✱	
S	Exotic Alloy								●			◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱						
	Sintered Components								◔		●		

Applicable External Holders ☞L124

Solid type / Negative (Without Hole)

Uncoated SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**RNGN 120400**	1	—	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞L32, L33

RNGN●●●●●● Coated

Dimensions (mm)				
	Inscribed Circle	9.525 to 12.7	Hole Dia.	-
	Thickness	3.18 to 4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application													
K	Cast Iron											●	✱
S	Exotic Alloy												
H	Hardened Steel	○	●	◔	○	◔	✱						
	Sintered Components												

Applicable External Holders ☞L124

Solid type / Negative (Without Hole)

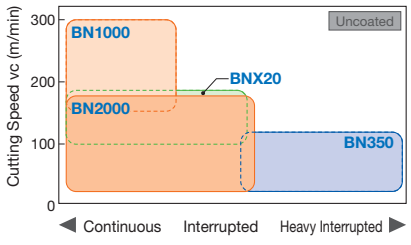
Coated SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**RNGN 090300**	1	—	9.5	—	—	—	—	—	—	—	—	—	—	●
	Standard	**RNGN 120300**	1	—	12.7	—	—	—	—	—	—	—	—	—	—	●
	Standard	**RNGN 120400**	1	—	12.7	—	—	—	—	—	—	—	—	—	—	●

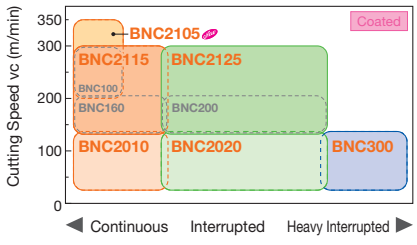
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞L32, L33

SUMIBORON Application Range Map

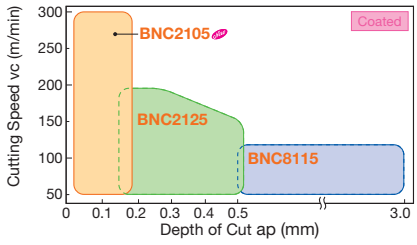
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



S Square type

SN■A1204●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	K Cast Iron							○	◕					✖	
	S Exotic Alloy								●					◕	●
	H Hardened Steel	○	◔	✪	●	◕	✖								
	Sintered Components								◕			●			

Applicable External Holders ☞ C21 to C26 Applicable Internal Holders ☞ E39 to E41

One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-SNMA 120404**	1	1	0.4	2.5			—		●		●		●	▲			—	—
		120408			0.8	2.3		●	—	●	●	●	●		●	▲			—	—
		120412			1.2	2.1		●	—	●	●	●	●		●	▲			—	—
	Standard	**T-NU-SNMA 120404**	10	1	0.4	2.5			—		●								—	—
		120408			0.8	2.3		●	—		●		●						—	—
		120412			1.2	2.1		●	—		●	●							—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33
*Depth of cut for one-use types is 0.5mm or less.

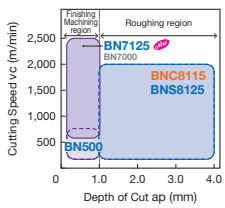
Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-SNGA 120404**	1	2	0.4	2.5		●	—		●			○	●				—	
		120408			0.8	2.3		●	—	●	●			○	●	▲			—	
		120412			1.2	2.1		●	—	●	●			○	●				—	
	Standard	**T-2NU-SNGA 120404**	10	2	0.4	2.5		●	—		●								—	—
		120408			0.8	2.3		●	—		●								—	—
		120412			1.2	2.1		●	—		●								—	—
	L Low Resistance T Negative Land	**2NU-SNGA 120404LT**	1	2	0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		120408LT			0.8	2.3	—		—	—	●	—	—	—	—	—	—	—	—	—
		120412LT			1.2	2.1	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**2NU-SNGA 120404HS**	1	2	0.4	2.5	—	—	—	—	●	—	—						—	—
		120408HS			0.8	2.3	—	—	—	—	●	—	—						—	—
		120412HS			1.2	2.1	—	—	—	—	●	—	—						—	—

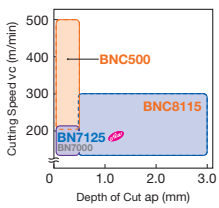
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

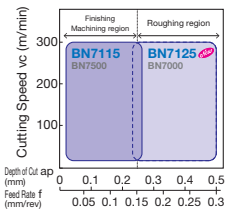
K Gray Cast Iron



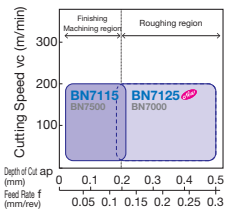
K Ductile Cast Iron



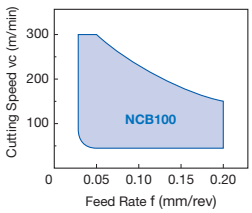
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S Square type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◔					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔			●			

SNMA120404 Uncoated

Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders ☞ C21 to C26 Applicable Internal Holders ☞ E39 to E41

Negative type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**SNMA 120404**	1	1	0.4	4.8													—	—
		120408			0.8	4.7		●			●				●	▲			—	—
		120412			1.2	4.6		●			●				●	▲			—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

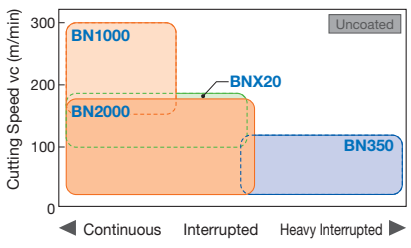
Solid type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**SNGA 120408**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120412			1.2	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—

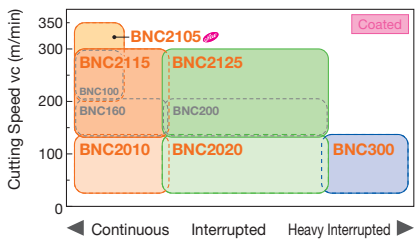
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

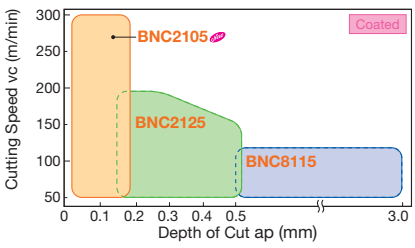
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S Square type

SNGA1204 ● ● Coated

Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON
	K Cast Iron	● ✖
	S Exotic Alloy	
	H Hardened Steel	○ ● ◕ ○ ◔ ✖
	Sintered Components	

Applicable External Holders ☞ C21 to C26 Applicable Internal Holders ☞ E39 to E41

Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**2NC-SNGA 120408**	1	2	0.8	2.3										●	—
		120412			1.2	2.1										●	—
	Standard	**4NC-SNGA 120404**	1	4	0.4	2.5		●	●	●	●						—
		120408			0.8	2.3		●	●	●	●						—
		120412			1.2	2.1		●	●	●	●						—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

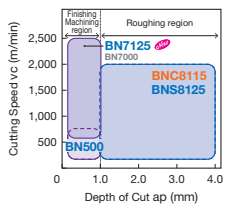
Solid type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**SNGA 120408**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	●
		120412			1.2	12.7	—	—	—	—	—	—	—	—	—	—	●

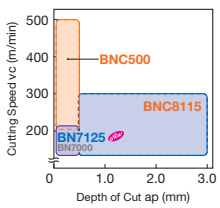
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

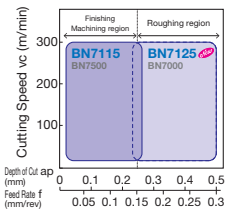
K Gray Cast Iron



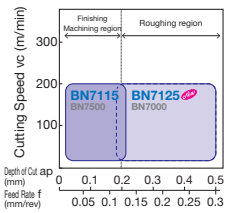
K Ductile Cast Iron



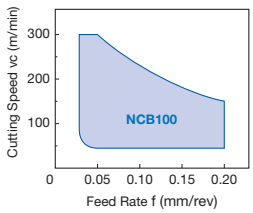
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



SUMIBORON Inserts

S Square type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								●			●			

SNGN090308 Uncoated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	3.18		

Applicable External Holders ☞ L122

Negative type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Full-top CBN (Standard)	**SNGN 090308-B**	1	4	0.8	9.5								○	●	▲			—	—
		090312-B			1.2	9.5													—	—
		090316-B			1.6	9.5													—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

Cutting Edge Specification Details ☞ L32, L33

Solid type / Negative (Without Hole)

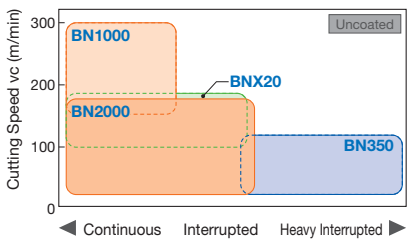
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**SNGN 090308**	1	8	0.8	9.5	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		090312			1.2	9.5	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	L Low Resistance F Sharp Edge	**SNGN 090308LF**	1	8	0.8	9.5	—	—	—	—	—	—	—	—	—	—	—	—		—
		090312LF			1.2	9.5	—	—	—	—	—	—	—	—	—	—	—	—		—
	Wiper Insert	**SNEN 090308W**	1	8	0.8	9.5	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	L Low Resistance F Sharp Edge Wiper Insert	**SNEN 090308LFW**	1	8	0.8	9.5	—	—	—	—	—	—	—	—	—	—	—	—		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

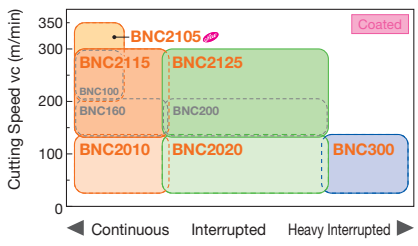
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

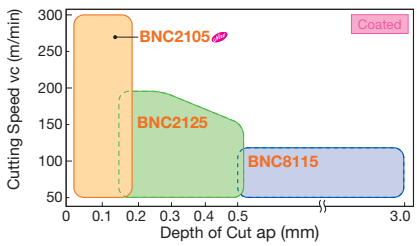
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts

S Square type

SN■N0903●● Coated

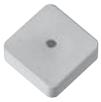
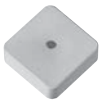
Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Coated SUMIBORON											
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	K Cast Iron										●	✱
	S Exotic Alloy											
	H Hardened Steel	○	●	◕	○	◔	✱					
	Sintered Components											

Applicable External Holders L122

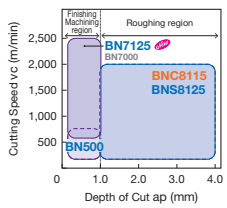
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**SNGN 090308**	1	8	0.8	9.5	—	—	—	—	—	—	—	—	—	—	●
		090312			1.2	9.5	—	—	—	—	—	—	—	—	—	—	●
	Wiper Insert	**SNEN 090308W**	1	8	0.8	9.5	—	—	—	—	—	—	—	—	—	—	●

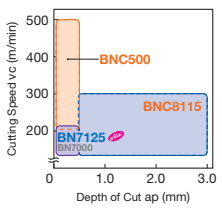
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

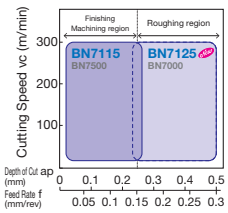
K Gray Cast Iron



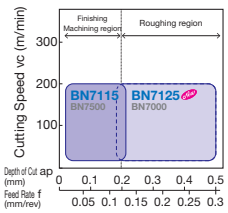
K Ductile Cast Iron



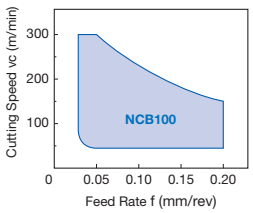
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



S Square type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

SNGN1203●● Uncoated

Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron						○	●					✱		
S	Exotic Alloy							●					◔	●	
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components							◔				●			

Applicable External Holders ☞ L122

Solid type / Negative (Without Hole)

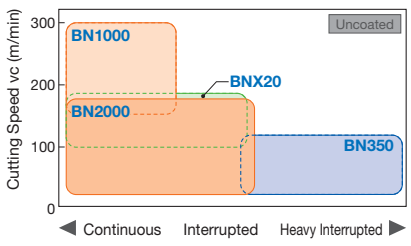
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**SNGN 120308**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120312			1.2	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	L Low Resistance F Sharp Edge	**SNGN 120308LF**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—		—
		120312LF			1.2	12.7	—	—	—	—	—	—	—	—	—	—	—	—		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

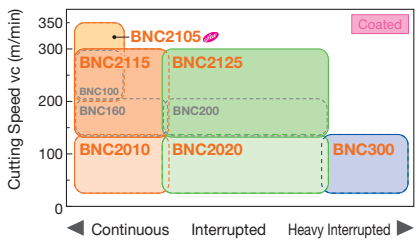
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

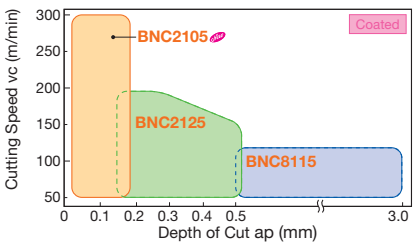
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



S Square type

SNGN1203●● Coated

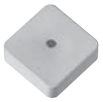
Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	K Cast Iron										●	✱
	S Exotic Alloy											
	H Hardened Steel	○	●	◕	○	◔	✱					
	Sintered Components											

Applicable External Holders L122

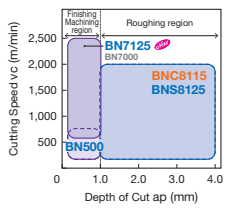
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**SNGN 120308**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	●
		120312			1.2	12.7	—	—	—	—	—	—	—	—	—	—	●

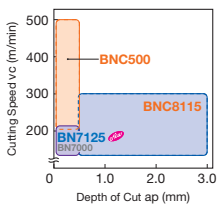
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

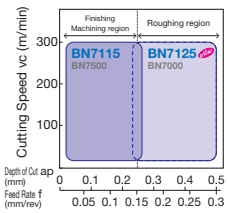
K Gray Cast Iron



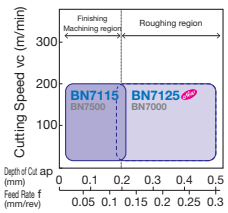
K Ductile Cast Iron



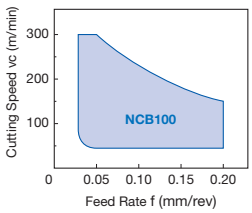
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



SUMIBORON Inserts

S Square type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●				✱		
S	Exotic Alloy								●				◔	●	●
H	Hardened Steel	○	◔	✲	●	●	✱								
	Sintered Components								●			●			

SNG■1204●● Uncoated

Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	4.76		

Applicable External Holders ☞ L122

Negative type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**SNGN 120408**	1	1	0.8	4.8		●			●		●						—	—
		120412			1.2	4.8		●			●								—	—
	Full-top CBN (Standard)	**SNGN 120408-B**	1	4	0.8	12.7	—			—	—			—			—	—	—	—
		120412-B			1.2	12.7	—			—	—			—			—	—	—	—
		120416-B			1.6	12.7	—			—	—			—			—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

Solid type / Negative (Dimple Lock)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**SNGX 120408**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120412			1.2	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120416			1.6	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

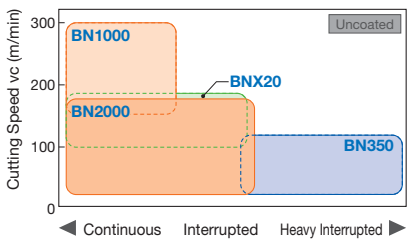
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**SNGN 120408**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120412			1.2	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120416			1.6	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		120420			2.0	12.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—

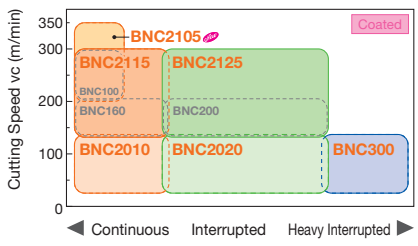
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

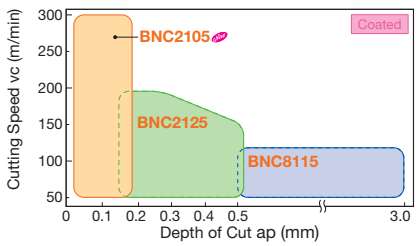
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



S Square type

SNG■1204●● Coated

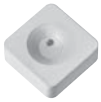
Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON
	K Cast Iron	● ✖
	S Exotic Alloy	
	H Hardened Steel	○ ● ◕ ○ ◔ ✖
	Sintered Components	

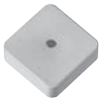
Applicable External Holders L122

Solid type / Negative (Dimple Lock)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**SNGX 120408**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	
		120412			1.2	12.7	—	—	—	—	—	—	—	—	—	—	●
		120416			1.6	12.7	—	—	—	—	—	—	—	—	—	—	●

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

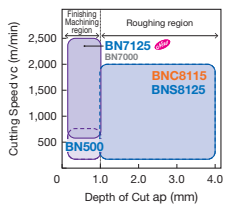
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**SNGN 120408**	1	8	0.8	12.7	—	—	—	—	—	—	—	—	—	—	●
		120412			1.2	12.7	—	—	—	—	—	—	—	—	—	—	●
		120416			1.6	12.7	—	—	—	—	—	—	—	—	—	—	●
		120420			2.0	12.7	—	—	—	—	—	—	—	—	—	—	●

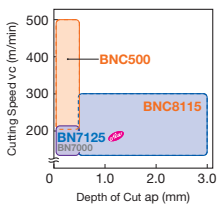
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

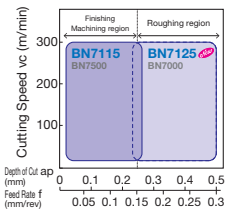
K Gray Cast Iron



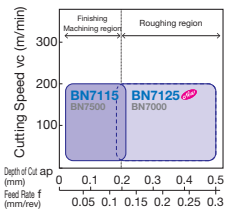
K Ductile Cast Iron



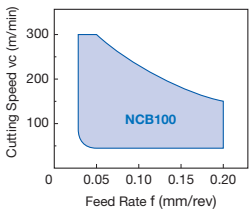
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



SUMIBORON Inserts

S Square type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

SPGN0903●● Uncoated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application													
K	Cast Iron							○	◕			✱	
S	Exotic Alloy								●			◕	●
H	Hardened Steel	○	◔	✲	●	◕	✱						
	Sintered Components								◕		●		

Applicable Internal Holders E37

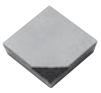
One-Use type / 11° Positive (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-SPGN 090304**	1	1	0.4	2.5		●			●				●	▲			—	
		090308			0.8	2.5		●			●		●		●	▲			—	
		T-NU-SPGN 090304	10	1	0.4	2.5		●			●								—	—
		090308			0.8	2.5		●			●								—	—
	L Low Resistance T Negative Land	**NU-SPGN 090304LT**	1	1	0.4	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		090308LT			0.8	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-SPGN 090304HS**	1	1	0.4	2.5	—	—	—	—	●	—	—						—	—
		090308HS			0.8	2.5	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-SPGN) for BNX25. Depth of cut for one-use types is 0.5mm or less.

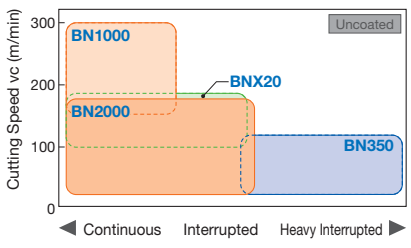
11° Positive type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**SPGN 090304**	1	1	0.4	4.8									●	▲			—	—
		090308			0.8	4.8									●	▲			—	—
		090312			1.2	4.8													—	—

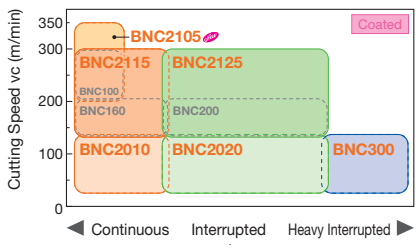
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

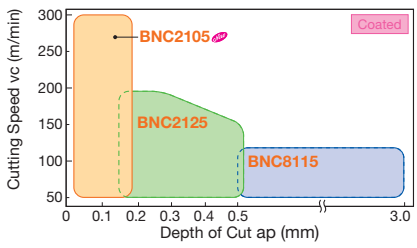
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S Square type

SPGN1203●● Uncoated

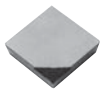
Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◕					✖	
S	Exotic Alloy								◕					◔	●
H	Hardened Steel	○	◔	✱	●	◕	✖								
	Sintered Components								◕			●			

Applicable External Holders C27, C28

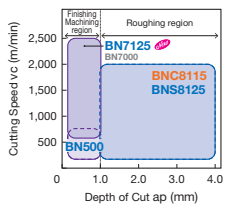
11° Positive type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length
	Standard	**SPGN 120308**	1	1	0.8	4.8
		120312			1.2	4.8

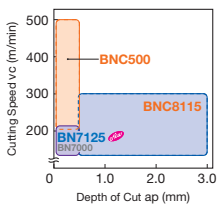
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

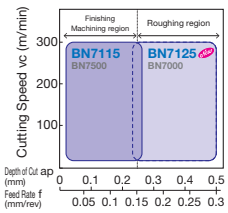
K Gray Cast Iron



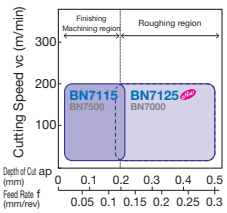
K Ductile Cast Iron



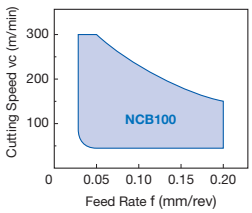
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

TN■■1604●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
	K Cast Iron							○	◔					✱	
	S Exotic Alloy								●					◔	●
	H Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔				●		

Applicable External Holders ☞ C29 to C35, D16, D20 Applicable Internal Holders ☞ E15, E47 to E49

One-Use type / Negative (With Hole)

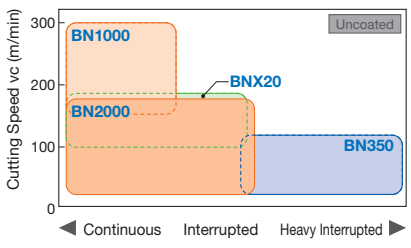
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-TNMA 160401**	1	1	0.1	2.5			—		●								—	—
		160402			0.2	2.4			—		●								—	—
		160404			0.4	2.3	●	●	—	●	●	●	●		●	▲			—	—
		160408			0.8	2.0	●	●	—	●	●	●	●		●	▲			—	—
		160412			1.2	2.0		●	—		●		●		●	▲			—	—
		T-NU-TNMA 160401	10	1	0.1	2.5			—										—	—
		160402			0.2	2.4			—										—	—
		160404			0.4	2.3	●	●	—	●	●	●	●						—	—
		160408			0.8	2.0	●	●	—	●	●	●	●						—	—
		160412			1.2	2.0		●	—										—	—
	Standard	**NS-TNMA 160404**	1	1	0.4	2.3	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.0	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160412			1.2	2.0	—	—		—	—	—	—	—	—	—	—	—	—	—
		T-NS-TNMA 160404	10	1	0.4	2.3	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.0	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160412			1.2	2.0	—	—		—	—	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

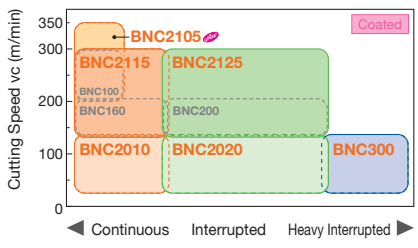
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

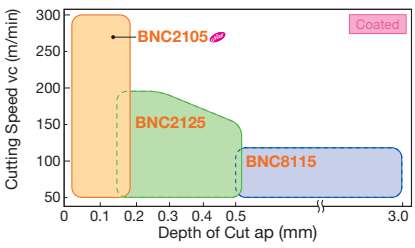
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts

TN■■1604●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ●: 1st Recommendation ○: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	K Cast Iron							○	●					✱	
	S Exotic Alloy								●					●	●
	H Hardened Steel	○	○	✱	●	●	✱								
	Sintered Components								●			●			

Applicable External Holders C29 to C35, D16, D20 — Applicable Internal Holders E15, E47 to E49

Uncoated SUMIBORON | BINDERLESS SUMIBORON

Multi-Cornered One-Use type / Negative (With Hole)

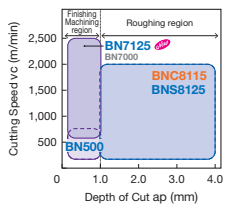
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	3NU-TNGA 160404	1	3	0.4	2.3		●	—	●	●	●		○	●	▲	●	●	—	
		160408			0.8	2.0		●	—	●	●	●		○	●	▲	●	●	—	
		160412			1.2	2.0		●	—		●	●		○	●		●	●	—	
		T-3NU-TNGA 160404	10	3	0.4	2.3		●	—		●			○	●	▲	●	●	—	—
		160408			0.8	2.0		●	—		●	●		○	●	▲			—	—
		160412			1.2	2.0		●	—		●								—	—
	Standard	3NS-TNGA 160404	1	3	0.4	2.3	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.0	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160412			1.2	2.0	—	—		—	—	—	—	—	—	—	—	—	—	—
		T-3NS-TNGA 160404	10	3	0.4	2.3	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.0	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160412			1.2	2.0	—	—		—	—	—	—	—	—	—	—	—	—	—
	Light Cutting Chipbreaker	3NU-TNGM 160404N-LV	1	3	0.4	2.3	—	—	—		●	—	—	—	—	—	—	—	—	—
		160408N-LV			0.8	2.0	—	—	—		●	—	—	—	—	—	—	—	—	—
		160412N-LV			1.2	2.0	—	—	—		●	—	—	—	—	—	—	—	—	—
	L Low Resistance F Sharp Edge	3NU-TNGA 160404LF	1	3	0.4	2.3	—	—	—	—	—	—	—	○	●	▲	●	●	—	—
		160408LF			0.8	2.0	—	—	—	—	—	—	—	○	●	▲	●	●	—	—
		160412LF			1.2	2.0	—	—	—	—	—	—	—						—	—
	L Low Resistance E With Honing	3NU-TNGA 160404LE	1	3	0.4	2.3	—	—	—	—	—	—	—	○	—	—	●	●	—	—
		160408LE			0.8	2.0	—	—	—	—	—	—	—	○	—	—	●	●	—	—
	L Low Resistance T Negative Land	3NU-TNGA 160404LT	1	3	0.4	2.3	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		160408LT			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		160412LT			1.2	2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	3NU-TNGA 160404LS	1	3	0.4	2.3	—	—	—	—	—	—	—	—	—	—	●	●	—	—
		160408LS			0.8	2.0	—	—	—	—	—	—	—	—	—	—	—	●	—	—
	H Strong Edge T Negative Land	3NU-TNGA 160404HT	1	3	0.4	2.3	—	—	—	—	—	●	—	—	—	—	—	—	—	—
		160408HT			0.8	2.0	—	—	—	—	—	●	—	—	—	—	—	—	—	—
		160412HT			1.2	2.0	—	—	—	—	—	●	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	3NU-TNGA 160404HS	1	3	0.4	2.3	—	—	—	—	●	—	—	○	●	▲	●	●	—	—
		160408HS			0.8	2.0	—	—	—	—	●	—	—	○	●	▲		●	—	—
		160412HS			1.2	2.0	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

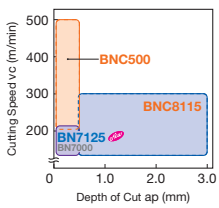
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

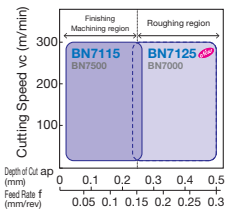
K Gray Cast Iron



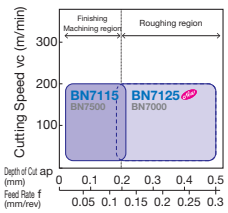
K Ductile Cast Iron



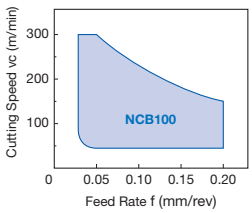
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts

T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								●			●			

TN■■1604●● Uncoated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders ☞ C29 to C35, D16, D20 Applicable Internal Holders ☞ E15, E47 to E49

Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	U Strong Edge S Negative Land With Honing	**3NU-TNGA 160404US**	1	3	0.4	2.3	—	—	—	—	—	—	—	—	—	—	●	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

*Depth of cut for one-use types is 0.5mm or less.

Negative type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TNMA 160402**	1	1	0.2	3.6		●			●								—	—
		160404			0.4	3.5		●			●								—	—
		160408			0.8	3.2		●			●		●		●	▲			—	—
		160412			1.2	2.9		●			●		●		●	▲			—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

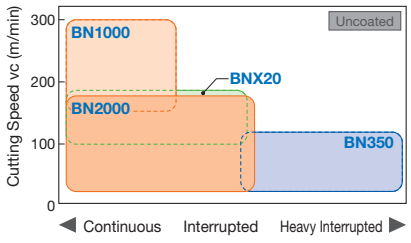
Solid type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TNGA 160408**	1	6	0.8	15.3	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		160412			1.2	15.7	—	—	—	—	—	—	—	—	—	—	—	—	●	—

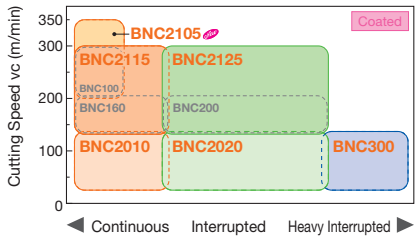
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

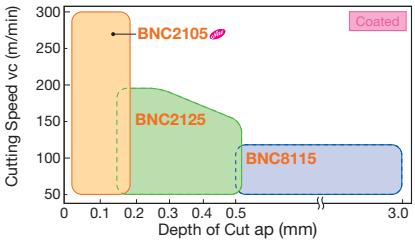
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

TNG■1604●● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

Applicable External Holders C29 to C35, D16, D20
Applicable Internal Holders E15, E47 to E49

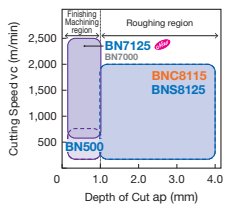
Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON: BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	3NC-TNGA 160404	1	3	0.4	2.3			●	●	●				●		—
		160408			0.8	2.0			●	●	●				●		—
		160412			1.2	2.0			●	●	●						—
		160416*			1.6	3.3				●	●	●		●	●		—
		160420*			2.0	3.0				●	●	●		●	●		—
		160424*			2.4	2.7				●	●	●		●	●		—
	Standard	6NC-TNGA 160402	1	6	0.2	2.4		●	●	●	●						—
		160404			0.4	2.3	●	●	●	●	●	●	●	●	●	●	—
		160408			0.8	2.0	●	●	●	●	●	●	●	●	●	●	—
		160412			1.2	2.0		●	●	●	●	●		●	●	●	—
		160416*			1.6	3.3		●	●	●	●	●		●	●		—
		160420*			2.0	3.0		●	●	●	●	●		●	●		—
		160424*			2.4	2.7		●	●	●	●	●		●	●		—
	Finishing Chipbreaker	6NC-TNGG 160404N-FV	1	6	0.4	2.3		●	●	●	●	—	—	●	●		—
		160408N-FV			0.8	2.0		●	●	●	●	—	—	●	●		—
		160412N-FV			1.2	2.0		●	●	●	●	—	—	●	●		—
	Light Cutting Chipbreaker	6NC-TNGG 160404N-LV	1	6	0.4	2.3		●	●	●	●	—	—	●	●		—
		160408N-LV			0.8	2.0		●	●	●	●	—	—	●	●		—
		160412N-LV			1.2	2.0		●	●	●	●	—	—	●	●		—
	Carburised Layer Removal Chipbreaker	6NC-TNGG 160404N-SV	1	6	0.4	2.3						—	—				—
		160408N-SV			0.8	2.0		●	●	●	●	—	—	●	●		—
		160412N-SV			1.2	2.0		●	●	●	●	—	—	●	●		—
	L Low Resistance E With Honing	3NC-TNGA 160404LE	1	3	0.4	2.3	—	—	—	●	—	—	—	—	—	—	—
		160408LE			0.8	2.0	—	—	—	●	—	—	—	—	—	—	—
		160412LE			1.2	2.0	—	—	—	●	—	—	—	—	—	—	—
	L Low Resistance T Negative Land	3NC-TNGA 160402LT	1	3	0.2	2.4	—	—	—	—	●	—	—	—	—	—	—
		160404LT			0.4	2.3	—	—	—	—	●	—	—	—	—	—	—
		160408LT			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—
		160412LT			1.2	2.0	—	—	—	—	●	—	—	—	—	—	—

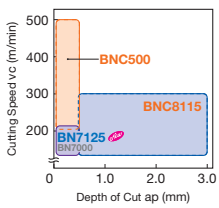
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33
*For use with the SUMIBORON Special Holders for High-Efficiency Machining shown on page L128.

SUMIBORON Application Range Map

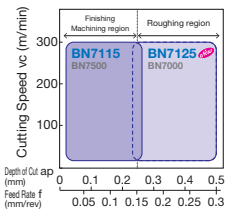
K Gray Cast Iron



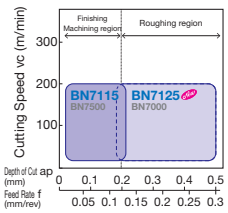
K Ductile Cast Iron



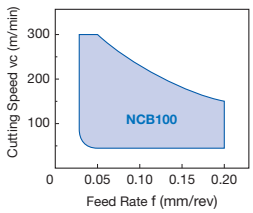
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✱
S	Exotic Alloy											
H	Hardened Steel	○	●	◔	○	◔	✱					
	Sintered Components											

TNG■1604●● Coated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders ☞ C29 to C35, D16, D20 Applicable Internal Holders ☞ E15, E47 to E49

Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	L Low Resistance S Negative Land With Honing	3NC-TNGA 160402LS	1	3	0.2	2.4			●	—	—					—	—
		160404LS			0.4	2.3	●	●	●	—	—	●				—	—
		160408LS			0.8	2.0	●	●	●	—	—	●				—	—
		160412LS			1.2	2.0		●	●	—	—	●				—	—
	L Low Resistance S Negative Land With Honing	6NC-TNGA 160404LS	1	6	0.4	2.3	—	—	—	—	—		●	●	●	—	—
		160408LS			0.8	2.0	—	—	—	—	—		●	●	●	—	—
		160412LS			1.2	2.0	—	—	—	—	—			●	●	—	—
	H Strong Edge S Negative Land With Honing	6NC-TNGA 160404HS	1	6	0.4	2.3	—	●	●	●	●	●	—	●	●	●	—
		160408HS			0.8	2.0	—	●	●	●	●	●	—	●	●	●	—
		160412HS			1.2	2.0	—	●	●	●	●	●	—	●	●	●	—
	E High Efficiency S Negative Land With Honing	6NC-TNGA 160404ES	1	6	0.4	2.3	—	—	—	—	●	—	—	—	—	—	—
		160408ES			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—
		160412ES			1.2	2.0	—	—	—	—	●	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

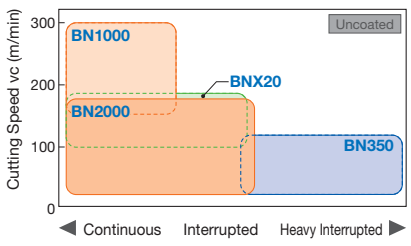
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	TNGA 160408	1	6	0.8	15.3	—	—	—	—	—	—	—	—	—	—	●
		160412			1.2	15.7	—	—	—	—	—	—	—	—	—	—	●

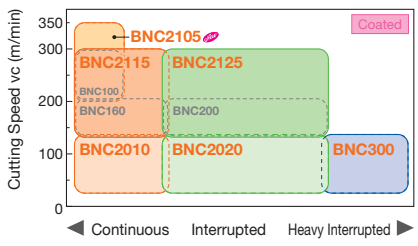
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

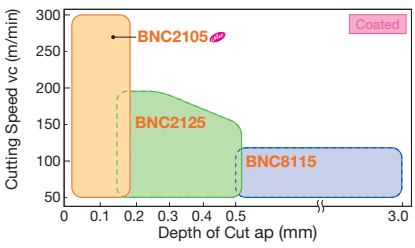
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



(Legend) Continuous Cutting ● : 1st Recommendation ○ : 2nd Recommendation | General machining ◕ : 1st Recommendation ◔ : 2nd Recommendation | Interrupted Cutting ✖ : 1st Recommendation ✖ : 2nd Recommendation

TNMA2204●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

Applicable External Holders C30 to C35 | Applicable Internal Holders E48, E49

Recommended Application

K	Cast Iron	○ ◕ ✖
S	Exotic Alloy	● ◕ ●
H	Hardened Steel	○ ◔ ✖ ● ◕ ✖
	Sintered Components	◕ ●

Negative type (With Hole)

Uncoated SUMIBORON | BINDERLESS SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TNMA 220408**	1	1	0.8	3.2		●			●								—	—
		220412			1.2	2.9					●								—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

TNGN1103●● Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	-
	Thickness	3.18		

Applicable External Holders L122

Recommended Application

K	Cast Iron	○ ◕ ✖
S	Exotic Alloy	● ◕ ●
H	Hardened Steel	○ ◔ ✖ ● ◕ ✖
	Sintered Components	◕ ●

Solid type / Negative (Without Hole)

Uncoated SUMIBORON | BINDERLESS SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TNGN 110308**	1	6	0.8	9.8	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		110312			1.2	9.2	—	—	—	—	—	—	—	—	—	—	—	—	●	—
	L Low Resistance F Sharp Edge	**TNGN 110308LF**	1	6	0.8	9.8	—	—	—	—	—	—	—	—	—	—	—	—		—
		110312LF			1.2	9.2	—	—	—	—	—	—	—	—	—	—	—	—		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

TNGN1103●● Coated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	-
	Thickness	3.18		

Applicable External Holders L122

Recommended Application

K	Cast Iron	● ✖
S	Exotic Alloy	
H	Hardened Steel	○ ● ◕ ○ ◔ ✖
	Sintered Components	

Solid type / Negative (Without Hole)

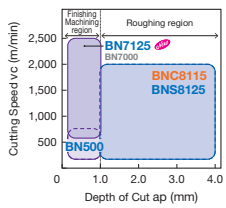
Coated SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**TNGN 110308**	1	6	0.8	9.8	—	—	—	—	—	—	—	—	—	—	●
		110312			1.2	9.2	—	—	—	—	—	—	—	—	—	—	●

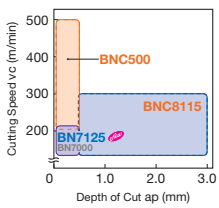
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

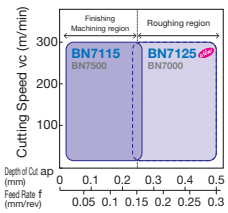
K Gray Cast Iron



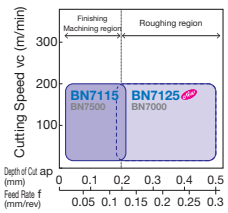
K Ductile Cast Iron



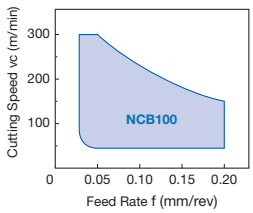
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ○: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					●	●
H	Hardened Steel	○	○	✱	●	●	✱								
	Sintered Components								●			●			

TNGN1604●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	4.76		

Applicable External Holders ☞ L122

Negative type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TNGN 160404**	1	1	0.4	3.5		●			●								—	—
		160408			0.8	3.2		●			●								—	—
		160412			1.2	2.9					●								—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TNGN 160408**	1	6	0.8	15.3	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		160416			1.6	14.2	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		160420			2.0	13.6	—	—	—	—	—	—	—	—	—	—	—	—	●	—
		160412			1.2	14.8	—	—	—	—	—	—	—	—	—	—	—	—	●	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

TNGN1604●● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	4.76		

Applicable External Holders ☞ L122

Recommended Application		Coated SUMIBORON												
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BN500	BNC8115		
K	Cast Iron										●	✱		
S	Exotic Alloy													
H	Hardened Steel	○	●	●	○	○	✱							
	Sintered Components													

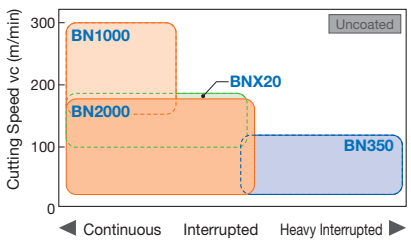
Solid type / Negative (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BN500	BNC8115
	Standard	**TNGN 160408**	1	6	0.8	15.3	—	—	—	—	—	—	—	—	—	—	●
		160412			1.2	14.8	—	—	—	—	—	—	—	—	—	—	●
		160416			1.6	14.2	—	—	—	—	—	—	—	—	—	—	●
		160420			2.0	13.6	—	—	—	—	—	—	—	—	—	—	●

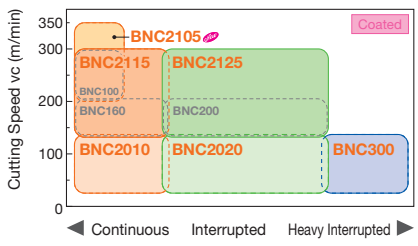
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

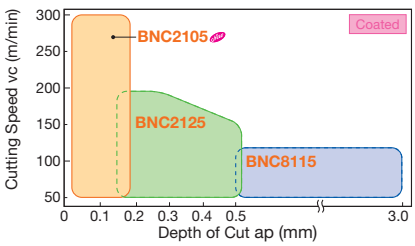
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



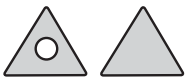
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



T Triangular type



TBEW0601 Uncoated

Dimensions (mm)	Inscribed Circle	3.97	Hole Dia.	2.2
	Thickness	1.59		

Applicable Internal Holders E42, E44

(Legend) Continuous Cutting: ● 1st Recommendation ○ 2nd Recommendation; General machining: ◕ 1st Recommendation ◔ 2nd Recommendation; Interrupted Cutting: ✖ 1st Recommendation ✖ 2nd Recommendation

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

One-Use type / 5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	L Low Resistance F Sharp Edge	**NU-TBEW 060102LF**	1	1	0.2	2.1	—	—	—	—	—	—	—						—	—
	L Low Resistance T Negative Land	**NU-TBEW 060102LT**	1	1	0.2	2.1	—	●	—			—	—	—	—	—	—	—	—	—

Uncoated SUMIBORON / BINDERLESS SUMIBORON

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

*Depth of cut for one-use types is 0.5mm or less.

TBGN0601 Uncoated

Dimensions (mm)	Inscribed Circle	3.97	Hole Dia.	-
	Thickness	1.59		

Applicable Internal Holders E80

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

5° Positive type (Without Hole)

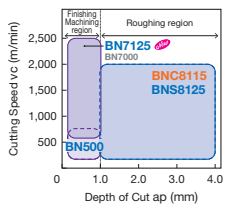
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Full-top CBN (Standard)	**TBGN 060102B**	1	3	0.2	6.5		●			●								—	—
		060104B			0.4	6.3	●	●			●	●	●	○	●				—	—
		060108B			0.8	5.7		●			●	●	●	○	●				—	—
	Full-top CBN (Emphasis on Edge Sharpness)	**TBGN 060102-BSTN**	1	3	0.2	6.5	—	●	—	—	—	—	—	—	—	—	—	—	—	—
		060104-BSTN			0.4	6.3	—	●	—	—	—	—	—	—	—	—	—	—	—	—
		060108-BSTN			0.8	5.7	—	●	—	—	—	—	—	—	—	—	—	—	—	—

Uncoated SUMIBORON / BINDERLESS SUMIBORON

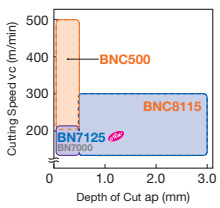
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

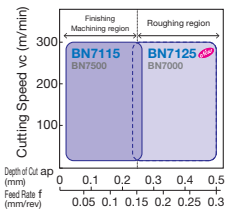
K Gray Cast Iron



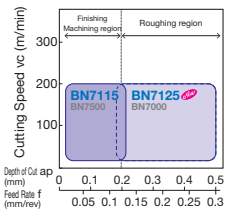
K Ductile Cast Iron



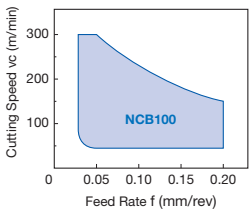
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability)

T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

TPGW0802●● Uncoated

Dimensions (mm)	Inscribed Circle	4.76	Hole Dia.	2.4
	Thickness	2.38		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
K	Cast Iron							○	◔					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔			●			

Applicable Internal Holders E42 to E45

One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	NU-TPGW 080202	1	1	0.2	2.6				●	●				●	▲			—	
		080204			0.4	2.5	●			●	●				●	▲			—	
		080208			0.8	2.2					●				●	▲			—	
	Standard	T-NU-TPGW 080202	10	1	0.2	2.6					●								—	—
		080204			0.4	2.5	●			●	●								—	—
		080208			0.8	2.2													—	—
	L Low Resistance F Sharp Edge	NU-TPGW 080202LF	1	1	0.2	2.6	—	—	—	—	—	—	—						—	—
		080204LF			0.4	2.5	—	—	—	—	—	—	—		●	▲			—	—
		080208LF			0.8	2.2	—	—	—	—	—	—	—						—	—
	L Low Resistance T Negative Land	NU-TPGW 080202LT	1	1	0.2	2.6	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		080204LT			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		080208LT			0.8	2.2	—	—	—	—		—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	NU-TPGW 080202HS	1	1	0.2	2.6	—	—	—	—	●	—	—						—	—
		080204HS			0.4	2.5	—	—	—	—	●	—	—						—	—
		080208HS			0.8	2.2	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-TPGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

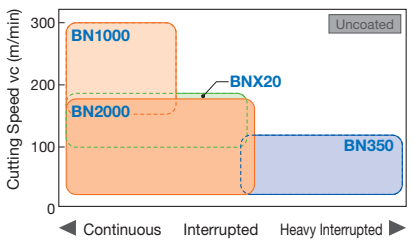
Multi-Cornered One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	3NU-TPGW 080202 New	1	3	0.2	2.6			—					○					—	
		080204 New			0.4	2.5			—					○					—	
	L Low Resistance F Sharp Edge	3NU-TPGW 080204LF New	1	3	0.4	2.5	—	—	—	—	—	—	—	○					—	—

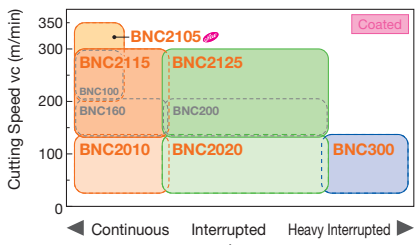
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

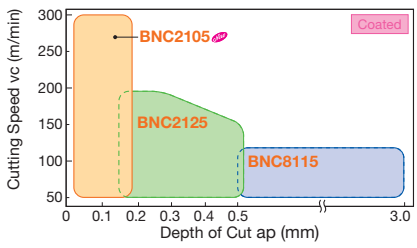
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

TPGW0802●● Coated

Dimensions (mm)				
	Inscribed Circle	4.76	Hole Dia.	2.4
	Thickness	2.38		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

Applicable Internal Holders ☞ E42 to E45

Multi-Cornered One-Use type / 11° Positive (With Hole)

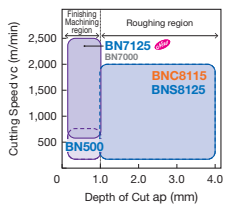
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	3NC-TPGW 080202	1	3	0.2	2.6		●	●	●	●						—
		080204			0.4	2.5		●	●	●	●						—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

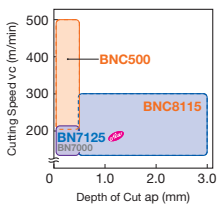
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

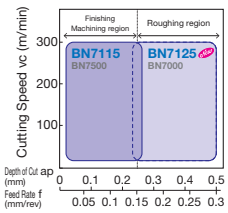
K Gray Cast Iron



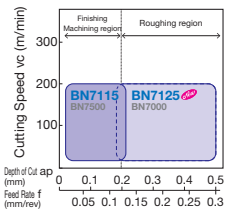
K Ductile Cast Iron



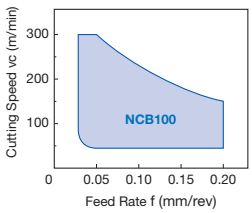
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

TPGW0902●● Uncoated

Dimensions (mm)				
	Inscribed Circle	5.56	Hole Dia.	2.8
	Thickness	2.38		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◔					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔			●			

Applicable Internal Holders E42

One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-TPGW 090202**	1	1	0.2	2.6					●				●	▲			—	
		090204			0.4	2.5				●	●				●	▲			—	
		090208			0.8	2.2					●								—	
	L Low Resistance T Negative Land	**NU-TPGW 090202LT**	1	1	0.2	2.6	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		090204LT			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-TPGW 090202HS**	1	1	0.2	2.6	—	—	—	—	●	—	—						—	—
		090204HS			0.4	2.5	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-TPGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

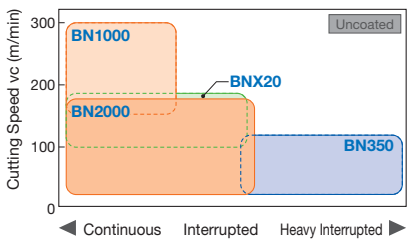
Multi-Cornered One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**3NU-TPGW 090202** New	1	3	0.2	2.6			—					○					—	
		090204 New			0.4	2.5			—					○					—	

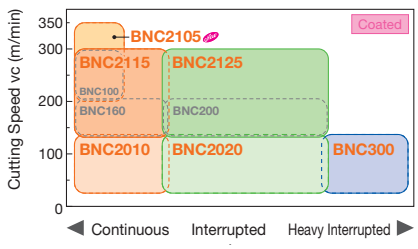
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

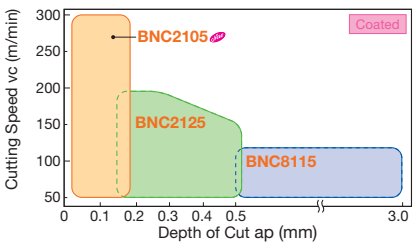
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

TPGW0902●● Coated

Dimensions (mm)				
	Inscribed Circle	5.56	Hole Dia.	2.8
	Thickness	2.38		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

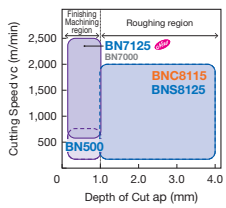
Multi-Cornered One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	3NC-TPGW 090202	1	3	0.2	2.6		●	●	●	●					●	—
		090204			0.4	2.5		●	●	●	●					●	—

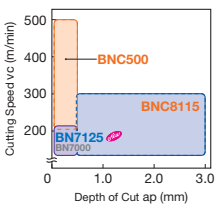
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

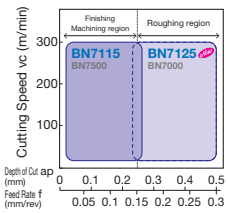
K Gray Cast Iron



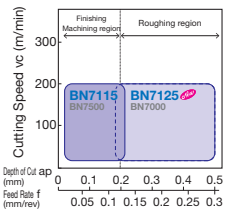
K Ductile Cast Iron



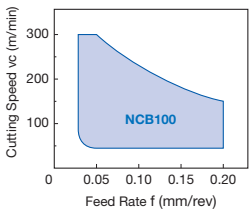
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

TPGW1102●● Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	2.38		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ○: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●				✱		
S	Exotic Alloy								●				✱	●	●
H	Hardened Steel	○	○	✱	●	●	✱								
	Sintered Components								●			●			

Applicable Internal Holders E42

One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-TPGW 110202**	1	1	0.2	2.5					●				●	▲			—	—
		110204			0.4	2.3	●				●				●	▲			—	—
		110208			0.8	2.0													—	—
		T-NU-TPGW 110202	10	1	0.2	2.5													—	—
		110204			0.4	2.3	●				●								—	—
		110208			0.8	2.0													—	—
	L Low Resistance T Negative Land	**NU-TPGW 110202LT**	1	1	0.2	2.5	—		—	—	●	—	—	—	—	—	—	—	—	—
		110204LT			0.4	2.3	—		—	—	●	—	—	—	—	—	—	—	—	—
		110208LT			0.8	2.0	—		—	—		—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-TPGW 110204HS**	1	1	0.4	2.3	—	—	—	—	●	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33
Use NS type (NS-TPGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

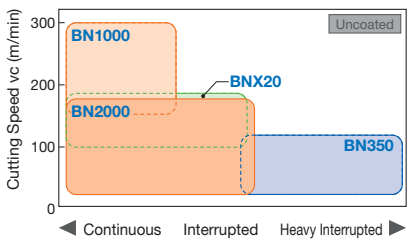
Multi-Cornered One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**3NU-TPGW 110202** New	1	3	0.2	2.5								○					—	—
		110204			0.4	2.3								○	●			●	—	—
		110208			0.8	2.0								○	●			●	—	—
	L Low Resistance F Sharp Edge	**3NU-TPGW 110204LF**	1	3	0.4	2.3	—	—	—	—	—	—	—	○	●			●	—	—
	L Low Resistance E With Honing	**3NU-TPGW 110204LE**	1	3	0.4	2.3	—	—	—	—	—	—	—	○	—	—	—	●	—	—
	L Low Resistance S Negative Land With Honing	**3NU-TPGW 110204LS**	1	3	0.4	2.3	—	—	—	—	—	—	—	—	—	—	—	●	—	—

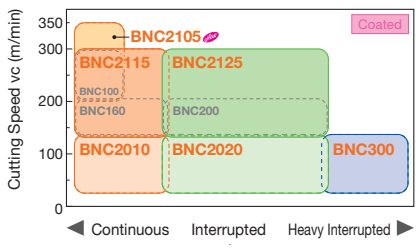
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33
Use 3NS type (3NS-TPGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

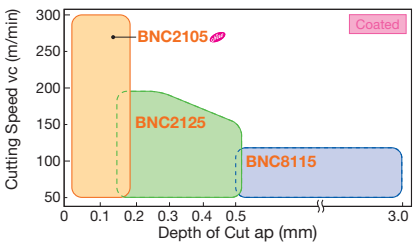
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

TPG■1103●● Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	3.4
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ●: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application

		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✖	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✖	●	●	✖								
	Sintered Components								●			●			

Uncoated SUMIBORON | BINDERLESS SUMIBORON

Applicable Internal Holders ☞ E14, E42 to E45

One-Use type / 11° Positive (With Hole)

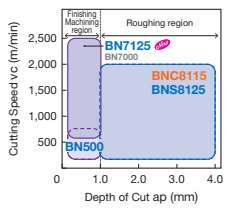
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-TPGW 110302**	1	1	0.2	2.6	●	●	—	●	●		●		●	▲			—	
		110304			0.4	2.5	●	●	—	●	●	●	●		●	▲			—	
		110308			0.8	2.2	●	●	—	●	●	●	●		●	▲			—	
		T-NU-TPGW 110302	10	1	0.2	2.6	●	●	—	●	●								—	—
		110304			0.4	2.5	●	●	—	●	●	●							—	—
		110308			0.8	2.2	●	●	—	●	●	●							—	—
	Standard	**NS-TPGW 110302**	1	1	0.2	2.6	—	—		—	—	—	—	—	—	—	—	—	—	—
		110304			0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		110308			0.8	2.2	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		T-NS-TPGW 110302	10	1	0.2	2.6	—	—		—	—	—	—	—	—	—	—	—	—	—
		110304			0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		110308			0.8	2.2	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
	L Low Resistance F Sharp Edge	**NU-TPGW 110302LF**	1	1	0.2	2.6	—	—	—	—	—	—	—		●	▲			—	—
		110304LF			0.4	2.5	—	—	—	—	—	—	—		●	▲			—	—
		110308LF			0.8	2.2	—	—	—	—	—	—	—		●	▲			—	—
	L Low Resistance T Negative Land	**NU-TPGW 110302LT**	1	1	0.2	2.6	—	●	—	—	●	—	—	—	—	—	—	—	—	—
		110304LT			0.4	2.5	—	●	—	—	●	—	—	—	—	—	—	—	—	—
		110308LT			0.8	2.2	—	●	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-TPGW 110302HS**	1	1	0.2	2.6	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		110304HS			0.4	2.5	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		110308HS			0.8	2.2	—	—	—	—	●	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

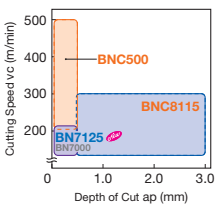
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

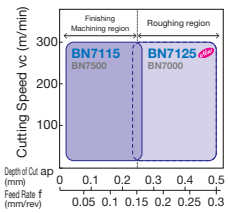
K Gray Cast Iron



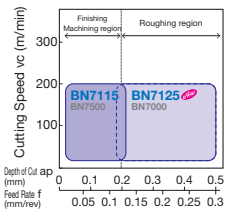
K Ductile Cast Iron



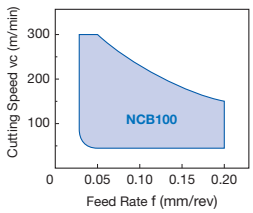
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

TPG■1103●● Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	3.4
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ●: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
K	Cast Iron							○	◔					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔			●			

Applicable Internal Holders E14, E42 to E45

Multi-Cornered One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**3NU-TPGW 110302** New	1	3	0.2	2.6								○					—	
		110304			0.4	2.5								○	●		●	●	—	
		110308			0.8	2.2								○	●		●	●	—	
	Finishing Chipbreaker	**3NU-TPGT 110304N-FV**	1	3	0.4	2.2	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		110308N-FV			0.8	1.9	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	L Low Resistance F Sharp Edge	**3NU-TPGW 110302LF**	1	3	0.2	2.6	—	—	—	—	—	—	—	○	●		●	●	—	—
		110304LF			0.4	2.5	—	—	—	—	—	—	—	○	●		●	●	—	—
		110308LF			0.8	2.2	—	—	—	—	—	—	—	○	●		●	●	—	—
	L Low Resistance E With Honing	**3NU-TPGW 110302LE** New	1	3	0.2	2.6	—	—	—	—	—	—	—	○	—	—			—	—
		110304LE			0.4	2.5	—	—	—	—	—	—	—	○	—	—	●	●	—	—
		110308LE New			0.8	2.2	—	—	—	—	—	—	—	○	—	—			—	—
	L Low Resistance S Negative Land With Honing	**3NU-TPGW 110304LS**	1	3	0.4	2.5	—	—	—	—	—	—	—	—	—	—		●	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use 3NS type (3NS-TPGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

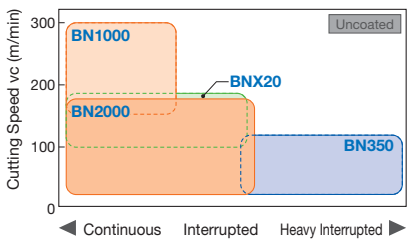
11° Positive type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TPGW 110304**	1	1	0.4	3.5		●			●				●	▲			—	—
		110308			0.8	3.2		●			●								—	—
	H Strong Edge S Negative Land With Honing	**TPGW 110304HS**	1	1	0.4	3.5	—	—	—	—	●	—	—						—	—
		110308HS			0.8	3.2	—	—	—	—	●	—	—						—	—

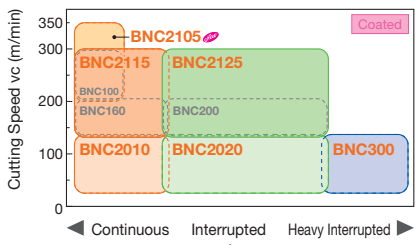
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

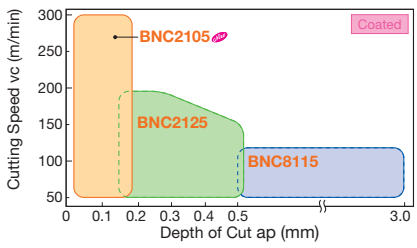
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

TPG■1103●●

Coated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	3.4
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

Applicable Internal Holders ☞ E14, E42 to E45

Multi-Cornered One-Use type / 11° Positive (With Hole)

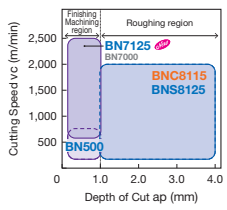
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	Coated SUMIBORON: BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	3NC-TPGW 110302	1	3	0.2	2.4		●	●	●	●						—
		110304			0.4	2.3	●	●	●	●	●	●	●	●	●	●	—
		110308			0.8	2.0	●	●	●	●	●	●	●	●	●	●	—
	Finishing Chipbreaker	3NC-TPGT 110304N-FV	1	3	0.4	2.2		●	●	●	●	—	—	●	●		—
		110308N-FV			0.8	1.9		●	●	●	●	—	—	●	●		—
	L Low Resistance E With Honing	3NC-TPGW 110302LE	1	3	0.2	2.4	—	—	—	●	—	—	—	—	—	—	—
		110304LE			0.4	2.3	—	—	—	●	—	—	—	—	—	—	—
		110308LE			0.8	2.0	—	—	—	●	—	—	—	—	—	—	—
	L Low Resistance T Negative Land	3NC-TPGW 110302LT	1	3	0.2	2.4	—	—	—	—	●	—	—	—	—	—	—
		110304LT			0.4	2.3	—	—	—	—	●	—	—	—	—	—	—
		110308LT			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	3NC-TPGW 110302LS	1	3	0.2	2.6		●	●	—	—					—	—
		110304LS			0.4	2.3	●	●	●	—	—	●	●	●	●	—	—
		110308LS			0.8	2.0	●	●	●	—	—	●	●	●	●	—	—
	H Strong Edge S Negative Land With Honing	3NC-TPGW 110304HS	1	3	0.4	2.3	—					●	—				—
		110308HS			0.8	2.0	—					●	—				—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

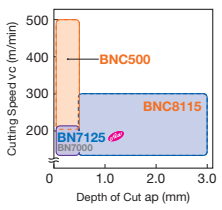
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

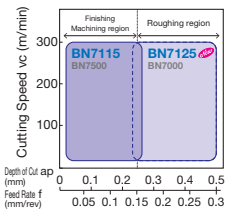
K Gray Cast Iron



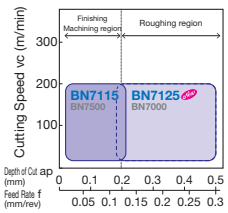
K Ductile Cast Iron



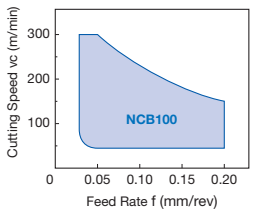
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



SUMIBORON Inserts

T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

TPGW1603●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	3.18		

Applicable Internal Holders E42

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	●	✱								
	Sintered Components								●			●			

One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-TPGW 160302**	1	1	0.2	2.4			—		●								—	
		160304			0.4	2.3			—		●								—	
		160308			0.8	2.0			—		●								—	

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

*Depth of cut for one-use types is 0.5mm or less.

TPGW1604●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders E14, E42 to E44

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	●	✱								
	Sintered Components								●			●			

One-Use type / 11° Positive (With Hole)

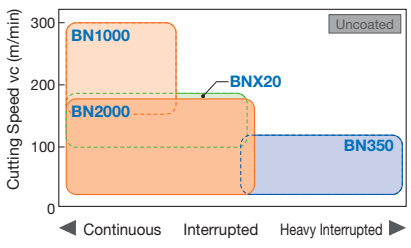
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-TPGW 160402**	1	1	0.2	2.6			—										—	
		160404			0.4	2.5	●	●	—	●	●	●	●		●	▲			—	
		160408			0.8	2.2	●	●	—	●	●	●	●		●	▲			—	
		T-NU-TPGW 160402	10	1	0.2	2.6			—										—	—
		160404			0.4	2.5	●	●	—	●	●	●	●						—	—
		160408			0.8	2.2	●	●	—	●	●	●							—	—
	Standard	**NS-TPGW 160402**	1	1	0.2	2.6	—	—		—	—	—	—	—	—	—	—	—	—	—
		160404			0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.2	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		T-NS-TPGW 160402	10	1	0.2	2.6	—	—		—	—	—	—	—	—	—	—	—	—	—
		160404			0.4	2.5	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.2	—	—	▲	—	—	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

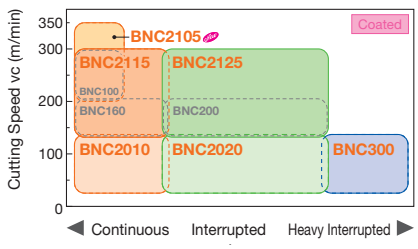
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

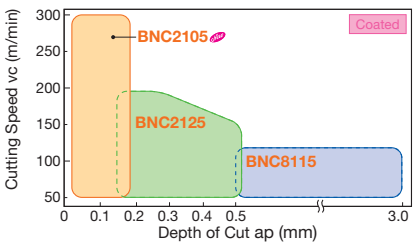
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

TPGW1604 Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application

		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
K	Cast Iron							○	◕					✱	
S	Exotic Alloy								●					◕	●
H	Hardened Steel	○	◔	✲	●	◕	✱								
	Sintered Components								◕			●			

Applicable Internal Holders E14, E42 to E44

One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	L Low Resistance F Sharp Edge	NU-TPGW 160402LF	1	1	0.2	2.6	—	—	—	—	—	—	—						—	—
		160404LF			0.4	2.5	—	—	—	—	—	—	—		●	▲			—	—
		160408LF			0.8	2.2	—	—	—	—	—	—	—						—	—
	L Low Resistance T Negative Land	NU-TPGW 160402LT	1	1	0.2	2.6	—		—	—		—	—	—	—	—	—	—	—	—
		160404LT			0.4	2.5	—	●	—	—	●	—	—	—	—	—	—	—	—	—
		160408LT			0.8	2.2	—	●	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	NU-TPGW 160404HS	1	1	0.4	2.5	—	—	—	—	●	—	—						—	—
		160408HS			0.8	2.5	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

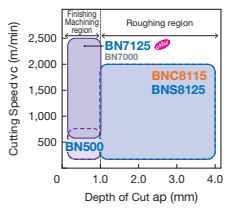
Multi-Cornered One-Use type / 11° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	3NU-TPGW 160404 New	1	3	0.4	2.5			—					○					—	
		160408 New			0.8	2.2			—					○					—	
	L Low Resistance F Sharp Edge	3NU-TPGW 160404LF New	1	3	0.4	2.5	—	—	—	—	—	—	—	○					—	—
		160408LF New			0.8	2.5	—	—	—	—	—	—	—	○					—	—

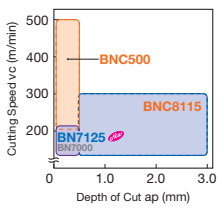
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

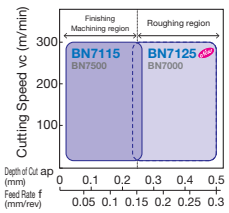
K Gray Cast Iron



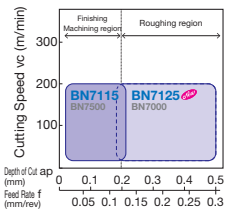
K Ductile Cast Iron



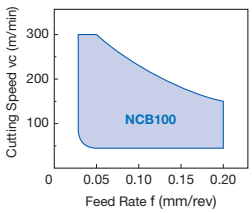
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✲: 2nd Recommendation

Recommended Application

K	Cast Iron							○	●			✖	
S	Exotic Alloy								●			◔	●
H	Hardened Steel	○	◔	✲	●	◔	✖						
	Sintered Components								◔		●		

TPGW1604●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders E14, E42 to E44

11° Positive type (With Hole)

Uncoated SUMIBORON

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TPGW 160404**	1	1	0.4	3.5		●			●								—	—
		160408			0.8	3.2		●			●								—	—
		160412			1.2	2.9													—	—
	H Strong Edge S Negative Land With Honing	**TPGW 160404HS**	1	1	0.4	3.5	—	—	—	—	●	—	—						—	—
		160408HS			0.8	3.5	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

Cutting Edge Specification Details L32, L33

Recommended Application

K	Cast Iron											●	✖
S	Exotic Alloy												
H	Hardened Steel	○	●	◔	○	◔	✖						
	Sintered Components												

TPGW1604●● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders E14, E42 to E44

Multi-Cornered One-Use type / 11° Positive (With Hole)

Coated SUMIBORON

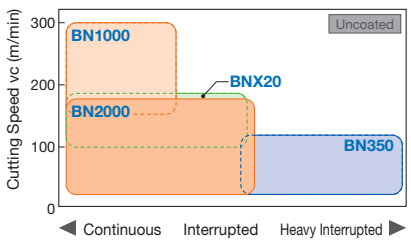
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**3NC-TPGW 160402**	1	3	0.2	2.4											—
		160404			0.4	2.3	●	●	●	●	●		●		●	●	—
		160408			0.8	2.0	●	●	●	●	●		●		●	●	—
	L Low Resistance S Negative Land With Honing	**3NC-TPGW 160404LS**	1	3	0.4	2.3				—	—		●		●	—	—
		160408LS			0.8	2.0				—	—		●		●	—	—
	H Strong Edge S Negative Land With Honing	**3NC-TPGW 160404HS**	1	3	0.4	2.3	—		●	●	●		—		●		—
		160408HS			0.8	2.0	—		●	●	●		—		●		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

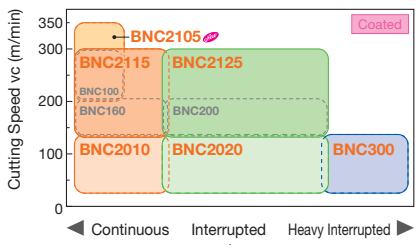
Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

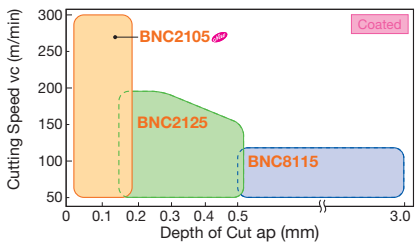
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



T Triangular type

TPGN0902 Uncoated

Dimensions (mm)	Inscribed Circle	5.56	Hole Dia.	-
	Thickness	2.38		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

11° Positive type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TPGN 090204**	1	1	0.4	3.5		●			●		●						—	—
		090208			0.8	3.2													—	—
	H Strong Edge S Negative Land With Honing	**TPGN 090204HS**	1	1	0.4	3.5	—	—	—	—	●	—	—						—	—

Uncoated SUMIBORON / BINDERLESS SUMIBORON

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

TPGN1103 Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	-
	Thickness	3.18		

Applicable Internal Holders E46

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

One-Use type / 11° Positive (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-TPGN 110302**	1	1	0.2	2.4					●								—	
		110304			0.4	2.3		●			●	●	●		●	▲			—	
		110308			0.8	2.0		●		●	●	●	●		●	▲			—	
		110312			1.2	2.0													—	
		T-NU-TPGN 110302	10	1	0.2	2.4													—	—
		110304			0.4	2.3		●			●								—	—
		110308			0.8	2.0		●			●								—	—
		110312			1.2	2.0													—	—

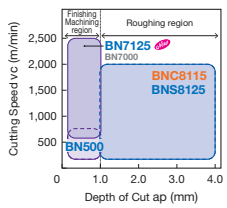
Uncoated SUMIBORON / BINDERLESS SUMIBORON

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

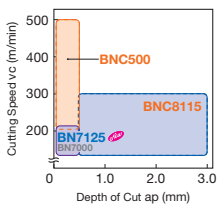
Use NS type (NS-TPGN) for BNX25. Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

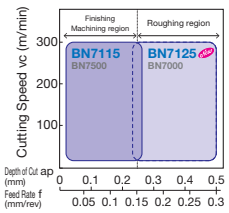
K Gray Cast Iron



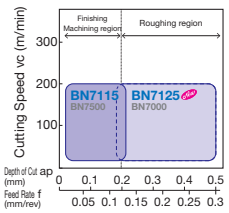
K Ductile Cast Iron



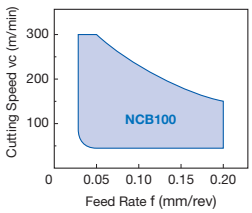
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

TPGN1103●● Uncoated

Dimensions (mm)				
	Inscribed Circle	6.35	Hole Dia.	-
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application													
K	Cast Iron							○	◔			✱	
S	Exotic Alloy								●			◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱						
	Sintered Components								◔		●		

Applicable Internal Holders E46

One-Use type / 11° Positive (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	L Low Resistance T Negative Land	NU-TPGN 110302LT	1	1	0.2	2.4	—		—	—	●	—	—	—	—	—	—	—	—	—
		110304LT			0.4	2.3	—		—	—	●	—	—	—	—	—	—	—	—	—
		110308LT			0.8	2.0	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	NU-TPGN 110304HS	1	1	0.4	2.3	—	—	—	—	●	—	—						—	—
		110308HS			0.8	2.0	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.
Cutting Edge Specification Details L32, L33
Use NS type (NS-TPGN) for BNX25. Depth of cut for one-use types is 0.5mm or less.

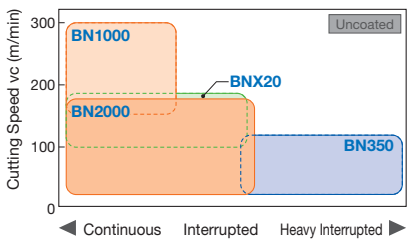
11° Positive type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	TPGN 110304	1	1	0.4	3.5		●			●				●	▲			—	—
		110308			0.8	3.2					●								—	—
	H Strong Edge S Negative Land With Honing	TPGN 110304HS	1	1	0.4	2.3	—	—	—	—	●	—	—						—	—
		110308HS			0.8	2.0	—	—	—	—	●	—	—						—	—

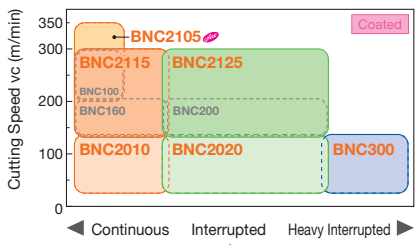
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.
Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

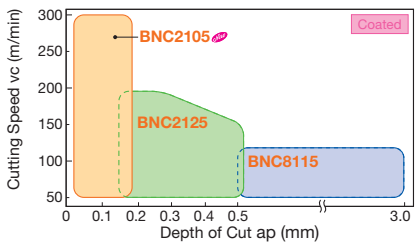
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

TPGN1603●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	-
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application	
K	Cast Iron
S	Exotic Alloy
H	Hardened Steel
	Sintered Components

Applicable External Holders C36, C37 Applicable Internal Holders E46

One-Use type / 11° Positive (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-TPGN 160302**	1	1	0.2	2.4					●								—	
		160304			0.4	2.3		●		●	●	●			●	▲			—	
		160308			0.8	2.0		●			●	●	●		●	▲			—	
		T-NU-TPGN 160302	10	1	0.2	2.4													—	—
		160304			0.4	2.3		●			●								—	—
		160308			0.8	2.0		●			●								—	—
	L Low Resistance T Negative Land	**NU-TPGN 160304LT**	1	1	0.4	2.3	—		—	—	●	—	—	—	—	—	—	—	—	—
		160308LT			0.8	2.0	—		—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-TPGN 160304HS**	1	1	0.4	2.3	—	—	—	—	●	—	—						—	—
		160308HS			0.8	2.0	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-TPGN) for BNX25. Depth of cut for one-use types is 0.5mm or less.

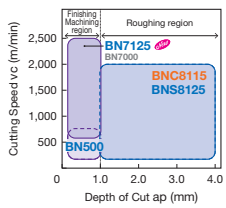
11° Positive type (Without Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**TPGN 160304**	1	1	0.4	3.5		●			●		●		●	▲			—	—
		160308			0.8	3.2		●			●								—	—
		160312			1.2	2.9													—	—
	H Strong Edge S Negative Land With Honing	**TPGN 160304HS**	1	1	0.4	3.5	—	—	—	—	●	—	—						—	—
		160308HS			0.8	3.5	—	—	—	—	●	—	—						—	—

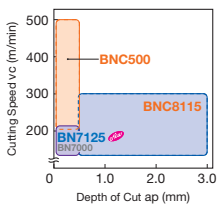
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

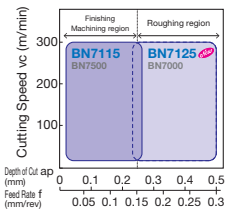
K Gray Cast Iron



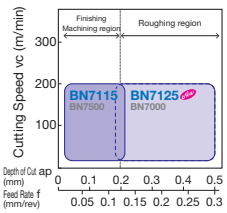
K Ductile Cast Iron



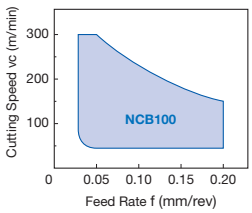
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

TPGN2204●● Uncoated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	-
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
K	Cast Iron						○	◔						✱	
S	Exotic Alloy							●						◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components							◔				●			

Applicable External Holders ☞ C36, C37

11° Positive type (Without Hole)

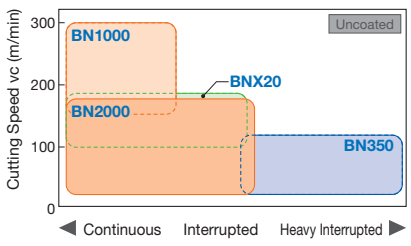
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length
	Standard	**TPGN 220408**	1	1	0.8	3.2
	H Strong Edge S Negative Land With Honing	**TPGN 220408HS**	1	1	0.8	3.2

Shape	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		●			●								—	—
	—	—	—	—	●	—	—						—	—

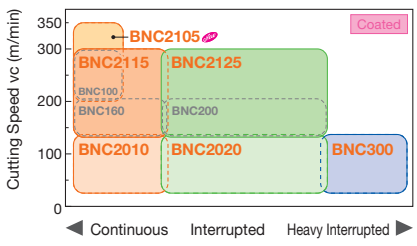
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

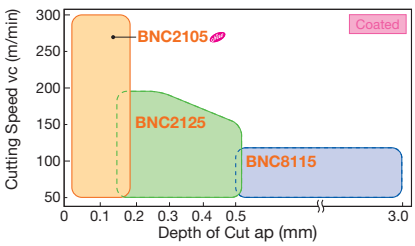
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

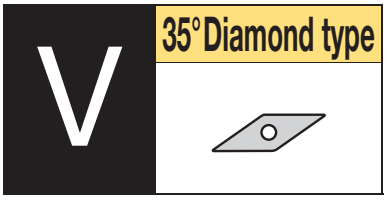


H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)





VN■■1604●● Uncoated

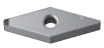
Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	K Cast Iron							○	◕					✖	
	S Exotic Alloy								●					◕	●
	H Hardened Steel	○	◔	✖	●	◕	✖								
	Sintered Components								◕			●			

Applicable External Holders C38, C39

One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-VNMA 160401**	1	1	0.1	3.5			—		●								—	—
		160402			0.2	3.3			—		●								—	—
		160404			0.4	2.8	●	●	—	●	●	●	●		●	▲			—	—
		160408			0.8	2.0	●	●	—	●	●	●	●		●	▲			—	—
		160412			1.2	1.7			—		●								—	—
		T-NU-VNMA 160401	10	1	0.1	3.5			—										—	—
		160402			0.2	3.3			—										—	—
		160404			0.4	2.8	●	●	—	●	●	●							—	—
		160408			0.8	2.0	●	●	—	●	●	●							—	—
		160412			1.2	1.7			—										—	—
	Standard	**NS-VNMA 160404**	1	1	0.4	2.8	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.0	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		T-NS-VNMA 160404	10	1	0.4	2.8	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.0	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
	Standard	**NU-VNGA 160404**	1	1	0.4	2.5	—	—	—	—	—	—	—	—	—	—	—	—	—	●
		160408			0.8	1.6	—	—	—	—	—	—	—	—	—	—	—	—	—	●

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33
*Depth of cut for one-use types is 0.5mm or less.

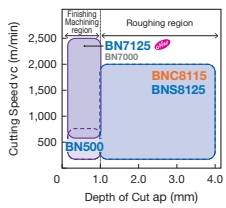
Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-VNGA 160404**	1	2	0.4	2.8		●	—	●	●	●		○	●	▲	●	●	—	
		160408			0.8	2.0		●	—	●	●	●		○	●	▲	●	●	—	
		T-2NU-VNGA 160404	10	2	0.4	2.8		●	—		●								—	—
		160408			0.8	2.0		●	—		●								—	—

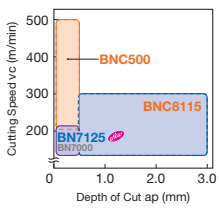
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

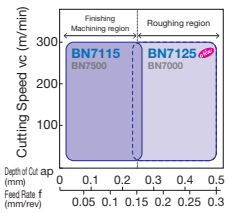
K Gray Cast Iron



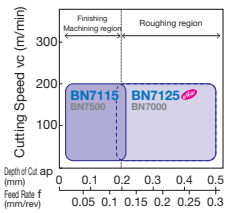
K Ductile Cast Iron



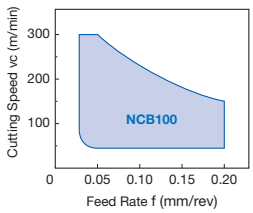
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

V 35° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

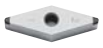
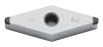
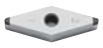
Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔			●			

VN■■1604●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

Applicable External Holders ☞ C38, C39

Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NS-VNGA 160404**	1	2	0.4	2.8	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.0	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		T-2NS-VNGA 160404	10	2	0.4	2.8	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
		160408			0.8	2.0	—	—	▲	—	—	—	—	—	—	—	—	—	—	—
	Light Cutting Chipbreaker	**2NU-VNGM 160404N-LV**	1	2	0.4	2.8	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		160408N-LV			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	L Low Resistance T Negative Land	**2NU-VNGA 160404LT**	1	2	0.4	2.8	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		160408LT			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge T Negative Land	**2NU-VNGA 160404HT**	1	2	0.4	2.8	—	—	—	—	—	●	—	—	—	—	—	—	—	—
		160408HT			0.8	2.0	—	—	—	—	—	●	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**2NU-VNGA 160404HS**	1	2	0.4	2.8	—	—	—	—	●	—	—	○	●	▲			—	—
		160408HS			0.8	2.0	—	—	—	—	●	—	—	○	●	▲			—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.
Cutting Edge Specification Details ☞ L32, L33
*Depth of cut for one-use types is 0.5mm or less.

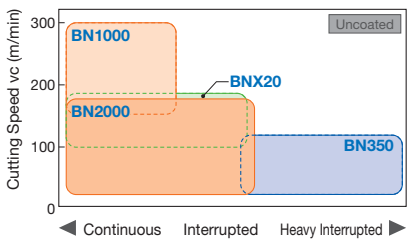
Negative type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**VNMA 160404**	1	1	0.4	5.0		●			●								—	—
		160408			0.8	4.1		●			●				●	▲			—	—

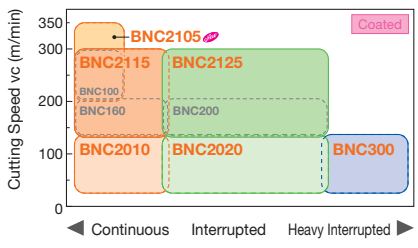
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

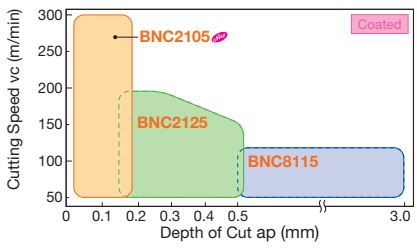
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts

V 35° Diamond type

VNG■1604●● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	3.81
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

Applicable External Holders ☞ C38, C39

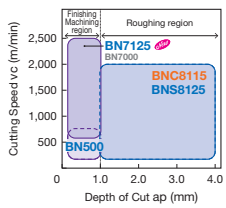
Multi-Cornered One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-VNGA 160404	1	2	0.4	2.8			●	●	●				●		—
		160408			0.8	2.0			●	●	●				●		—
		160412			1.2	1.7			●								—
	Standard	4NC-VNGA 160402	1	4	0.2	3.3		●	●	●	●						—
		160404			0.4	2.8	●	●	●	●	●	●	●	●	●	●	—
		160408			0.8	2.0	●	●	●	●	●	●	●	●	●	●	—
		160412			1.2	1.7		●	●		●				●		—
	Finishing Chipbreaker	4NC-VNGG 160404N-FV	1	4	0.4	2.8			●	●	●	—	—	●	●		—
		160408N-FV			0.8	2.0			●	●	●	—	—	●	●		—
	Light Cutting Chipbreaker	4NC-VNGG 160404N-LV	1	4	0.4	2.8			●	●	●	—	—	●	●		—
		160408N-LV			0.8	2.0			●	●	●	—	—	●	●		—
	L Low Resistance T Negative Land	2NC-VNGA 160402LT	1	2	0.2	3.3	—	—	—	—	●	—	—	—	—	—	—
		160404LT			0.4	2.8	—	—	—	—	●	—	—	—	—	—	—
		160408LT			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—
		160412LT			1.2	1.7	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NC-VNGA 160402LS	1	2	0.2	3.3			●	—	—					—	—
		160404LS			0.4	2.8	●	●	●	—	—					—	—
		160408LS			0.8	2.0	●	●	●	—	—					—	—
		160412LS			1.2	1.7		●	●	—	—					—	—
	L Low Resistance S Negative Land With Honing	4NC-VNGA 160404LS	1	4	0.4	2.8	—	—	—	—	—		●	●	●	—	—
		160408LS			0.8	2.0	—	—	—	—	—		●	●	●	—	—
		160412LS			1.2	1.7	—	—	—	—	—				●	—	—
	H Strong Edge S Negative Land With Honing	4NC-VNGA 160404HS	1	4	0.4	2.8	—	●	●	●	●	●	—	●	●	●	—
		160408HS			0.8	2.0	—	●	●	●	●	●	—	●	●	●	—
		160412HS			1.2	1.7	—	●	●		●		—		●		—
	E High Efficiency S Negative Land With Honing	4NC-VNGA 160404ES	1	4	0.4	2.8	—	—	—	—	●	—	—	—	—	—	—
		160408ES			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—
		160412ES			1.2	1.7	—	—	—	—	●	—	—	—	—	—	—

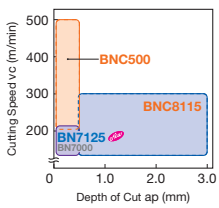
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

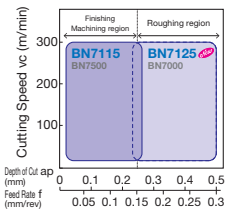
K Gray Cast Iron



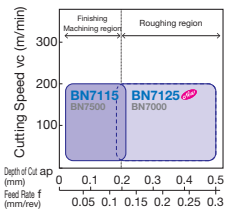
K Ductile Cast Iron



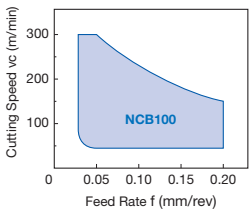
Sintered Alloy General Sintered Alloy



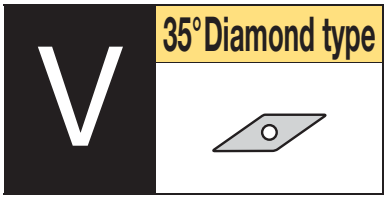
Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



SUMIBORON Inserts



Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

VBGW1103 ● ● Uncoated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◔					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔			●			

One-Use type / 5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-VBGW 110302**	1	1	0.2	3.2				●	●								—	
		110304			0.4	2.8 *1				●	●				●	▲			—	●
		110308			0.8	2.0 *2					●				●	▲			—	●
	L Low Resistance T Negative Land	**NU-VBGW 110302LT**	1	1	0.2	3.2	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		110304LT			0.4	2.8	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		110308LT			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-VBGW 110302HS**	1	1	0.2	3.2	—	—	—	—	●	—	—						—	—
		110304HS			0.4	2.8	—	—	—	—	●	—	—						—	—
		110308HS			0.8	2.0	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-VBGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

*1: NCB100 cutting edge length is 2.5.

*2: NCB100 cutting edge length is 1.6.

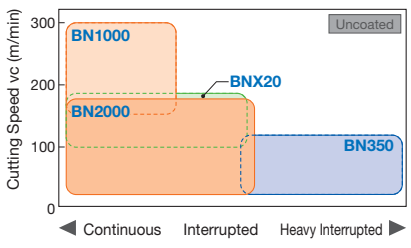
Multi-Cornered One-Use type / 5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-VBGW 110302** New	1	2	0.2	3.2			—					○					—	
		110304			0.4	2.8			—					○	●		●		—	
		110308			0.8	2.0			—						●				—	

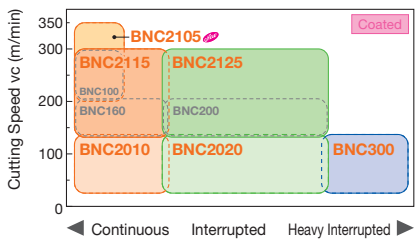
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

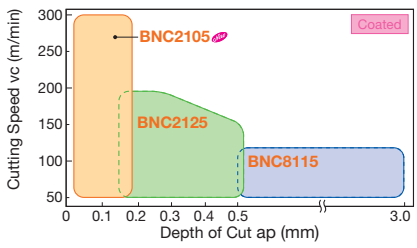
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



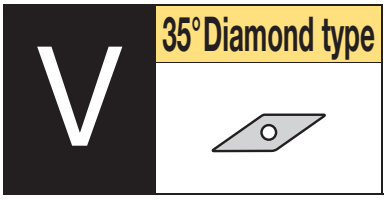
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)



VBGW1103●● Coated

Dimensions (mm)	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

Applicable Internal Holders ☞ E50, E52, E53, E55, E56, E58, E59

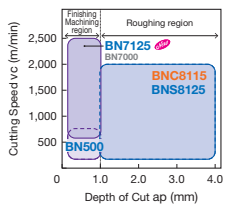
Multi-Cornered One-Use type / 5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-VBGW 110302	1	2	0.2	3.2		●	●	●	●						—
		110304			0.4	2.8		●	●	●	●					●	—
		110308			0.8	2.0		●	●	●	●					●	—
	L Low Resistance T Negative Land	2NC-VBGW 110302LT	1	2	0.2	3.2	—	—	—	—	●	—	—	—	—	—	—
		110304LT			0.4	2.8	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NC-VBGW 110302LS	1	2	0.2	3.2		●	●	—	—					—	—
		110304LS			0.4	2.8		●	●	—	—					—	—
		110308LS			0.8	2.0		●	●	—	—					—	—

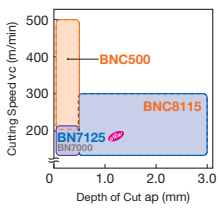
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

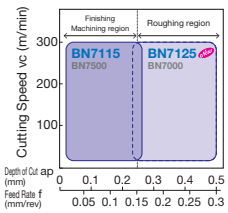
K Gray Cast Iron



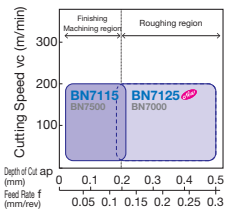
K Ductile Cast Iron



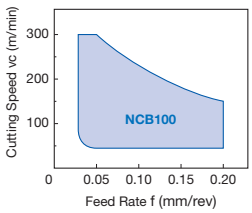
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



V 35° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

VBGW1604●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable Internal Holders ☞ E14, E50, E52, E55, E58

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
K	Cast Iron							○	◔					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔			●			

One-Use type / 5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-VBGW 160402**	1	1	0.2	3.8			—	●	●								—	
		160404			0.4	3.3 *1			—	●	●								—	●
		160408			0.8	2.5 *2			—	●	●								—	●
	L Low Resistance T Negative Land	**NU-VBGW 160402LT**	1	1	0.2	3.8	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		160404LT			0.4	3.3	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		160408LT			0.8	2.5	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-VBGW 160404HS**	1	1	0.4	3.3	—	—	—	—	●	—	—						—	—
		160408HS			0.8	2.5	—	—	—	—	●	—	—						—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

*Depth of cut for one-use types is 0.5mm or less.
*1: NCB100 cutting edge length is 2.5.
*2: NCB100 cutting edge length is 1.6.

Multi-Cornered One-Use type / 5° Positive (With Hole)

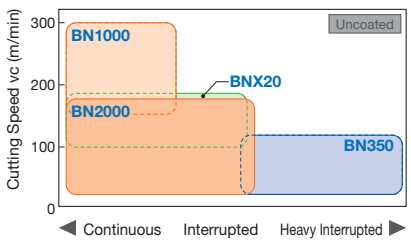
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-VBGW 160404**	1	2	0.4	3.3			—					○	●		●		—	
		160408			0.8	2.5			—					○	●		●		—	

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

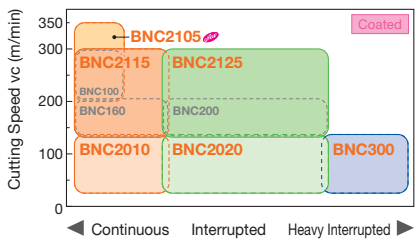
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

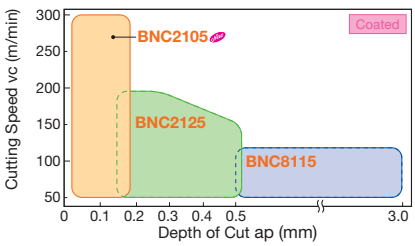
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



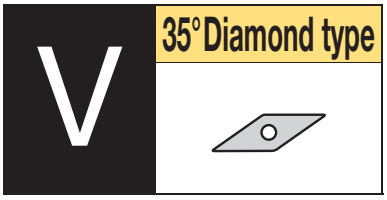
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability)



VBGW1604 ● ● Coated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON
	K Cast Iron	● ✖
	S Exotic Alloy	
	H Hardened Steel	○ ● ◕ ○ ◔ ✖
	Sintered Components	

Applicable Internal Holders ☞ E14, E50, E52, E55, E58

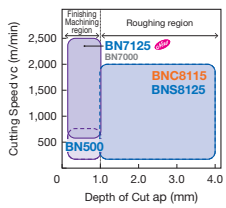
Multi-Cornered One-Use type / 5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-VBGW 160402	1	2	0.2	3.8		●	●	●	●						—
		160404			0.4	3.3	●	●	●	●	●					●	—
		160408			0.8	2.5	●	●	●	●	●					●	—
	L Low Resistance E With Honing	2NC-VBGW 160402LE	1	2	0.2	3.8	—	—	—	●	—	—	—	—	—	—	—
		160404LE			0.4	3.3	—	—	—	●	—	—	—	—	—	—	—
		160408LE			0.8	2.5	—	—	—	●	—	—	—	—	—	—	—
	L Low Resistance T Negative Land	2NC-VBGW 160402LT	1	2	0.2	3.8	—	—	—	—	●	—	—	—	—	—	—
		160404LT			0.4	3.3	—	—	—	—	●	—	—	—	—	—	—
		160408LT			0.8	2.5	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	2NC-VBGW 160402LS	1	2	0.2	3.8		●	●	—	—					—	—
		160404LS			0.4	3.3	●	●	●	—	—					—	—
		160408LS			0.8	2.5	●	●	●	—	—					—	—

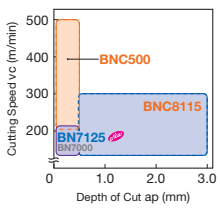
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

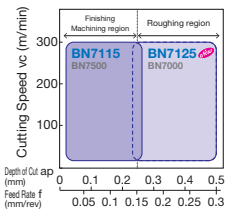
K Gray Cast Iron



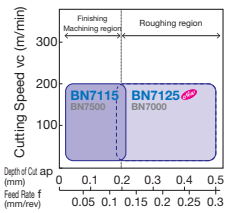
K Ductile Cast Iron



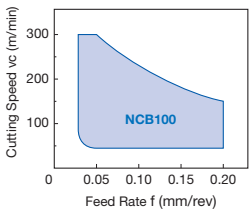
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



V 35° Diamond type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
		Uncoated SUMIBORON												BINDERLESS SUMIBORON	
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	●	✱								
	Sintered Components								●			●			

VCGW0802●● Uncoated

Dimensions (mm)				
	Inscribed Circle	4.76	Hole Dia.	2.3
	Thickness	2.38		

Applicable Internal Holders E51, E54, E57, E60

One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-VCGW 080202**	1	1	0.2	3.3			—		●								—	
		080204			0.4	2.8			—		●								—	
		080208			0.8	2.0			—		●								—	
	L Low Resistance T Negative Land	**NU-VCGW 080202LT**	1	1	0.2	3.3	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		080204LT			0.4	2.8	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		080208LT			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—
	H Strong Edge S Negative Land With Honing	**NU-VCGW 080204HS**	1	1	0.4	2.8	—	—	—	—	●	—	—	—	—	—	—	—	—	—
		080208HS			0.8	2.0	—	—	—	—	●	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

*Depth of cut for one-use types is 0.5mm or less.

Recommended Application		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
		Coated SUMIBORON										
K	Cast Iron										●	✱
S	Exotic Alloy											
H	Hardened Steel	○	●	●	○	◔	✱					
	Sintered Components											

VCGW0802●● Coated

Dimensions (mm)				
	Inscribed Circle	4.76	Hole Dia.	2.3
	Thickness	2.38		

Applicable Internal Holders E51, E54, E57, E60

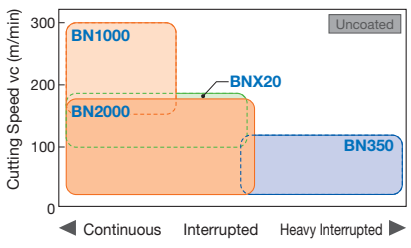
Multi-Cornered One-Use type / 5° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	**2NC-VCGW 080202**	1	2	0.2	3.3				●	●						—
		080204			0.4	2.8				●	●						—

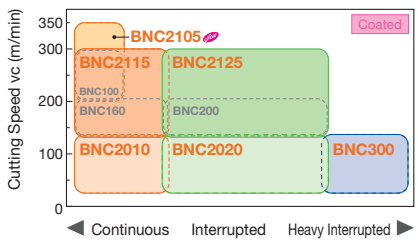
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

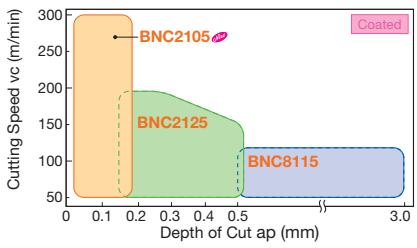
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel

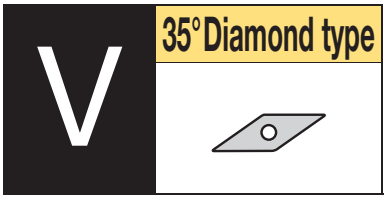


H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)





VCGW1103 Uncoated

Dimensions (mm)				
	Inscribed Circle	6.35	Hole Dia.	2.8
	Thickness	3.18		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	K Cast Iron							○	◕					✖	
	S Exotic Alloy								●					◕	●
	H Hardened Steel	○	◔	✱	●	◕	✖								
	Sintered Components								◕			●			

Applicable External Holders C40, C41, D15, D28 Applicable Internal Holders E54, E57, E60

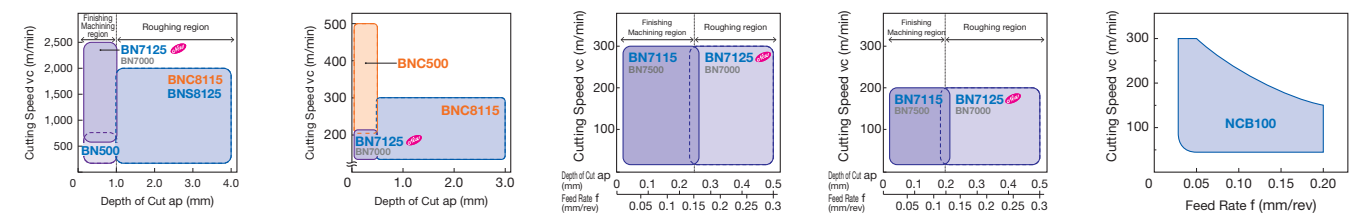
One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-VCGW 110302**	1	1	0.2	3.3				●	●								—	
		110304			0.4	2.8				●	●								—	
	H Strong Edge S Negative Land With Honing	**NU-VCGW 110302HS**	1	1	0.2	3.3	—	—	—	—	●	—	—						—	—
		110304HS			0.4	2.8	—	—	—	—	●	—	—						—	—

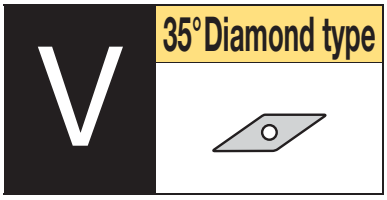
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

Use NS type (NS-VCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map



SUMIBORON Inserts



Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON											BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	●					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								●			●			

VC■■1604●● Uncoated

Dimensions (mm)	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

Applicable External Holders ☞ C40, C41 Applicable Internal Holders ☞ E54, E57

One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-VCGW 160404**	1	1	0.4	2.8 *1									●	▲			—	●
		160408			0.8	1.9 *2													—	●

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

Use NS type (NS-VCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.
*1: NCB100 cutting edge length is 2.5. *2: NCB100 cutting edge length is 1.6.

Multi-Cornered One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**2NU-VCGW 160404** New	1	2	0.4	2.8								○					—	

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

Use 2NS type (2NS-VCGW) for BNX25. Depth of cut for one-use types is 0.5mm or less.

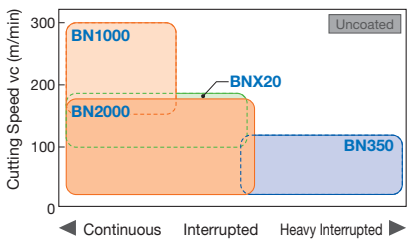
7° Positive type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**VCMW 160404**	1	1	0.4	5.2		●											—	—
		160408			0.8	4.3		●					●						—	—

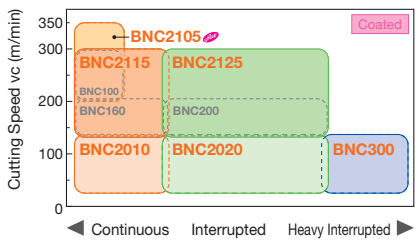
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

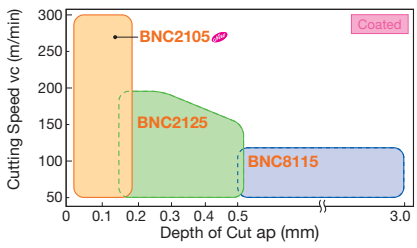
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



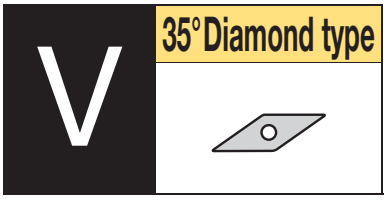
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)



VCGW1604●● Coated

Dimensions (mm)				
	Inscribed Circle	9.525	Hole Dia.	4.4
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

Applicable External Holders ☞ C40, C41 Applicable Internal Holders ☞ E54, E57

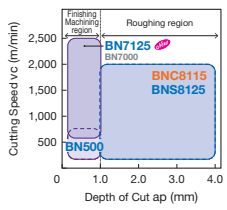
Multi-Cornered One-Use type / 7° Positive (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	2NC-VCGW 160404	1	2	0.4	2.8	●	●	●	●	●		●	●	●		—
		160408			0.8	1.9	●	●	●	●	●		●	●	●		—
	L Low Resistance S Negative Land With Honing	2NC-VCGW 160404LS	1	2	0.4	2.8	●	●	●	—	—		●	●	●	—	—
		160408LS			0.8	1.9	●	●	●	—	—		●	●	●	—	—
	H Strong Edge S Negative Land With Honing	2NC-VCGW 160404HS	1	2	0.4	2.8	—		●	●	●		—	●	●		—
		160408HS			0.8	1.9	—		●	●	●		—	●	●		—

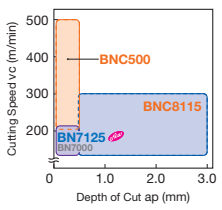
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

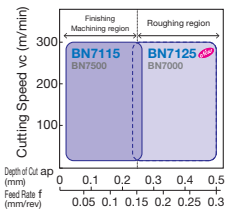
K Gray Cast Iron



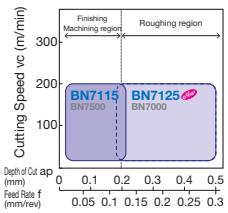
K Ductile Cast Iron



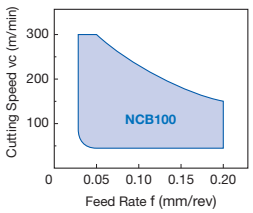
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



W Trigon type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

WNMA0804●● Uncoated

Dimensions (mm)				
	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ●: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✱: 1st Recommendation ✲: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◔					✱	
S	Exotic Alloy								●					◔	●
H	Hardened Steel	○	◔	✲	●	◔	✱								
	Sintered Components								◔			●			

Applicable External Holders C42, C43
Applicable Internal Holders E64, E65

One-Use type / Negative (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**NU-WNMA 080404**	1	1	0.4	3.3					●								—	—
		080408			0.8	2.8					●								—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.
Cutting Edge Specification Details L32, L33
Use NS type (NS-WNMA) for BNX25. Depth of cut for one-use types is 0.5mm or less.

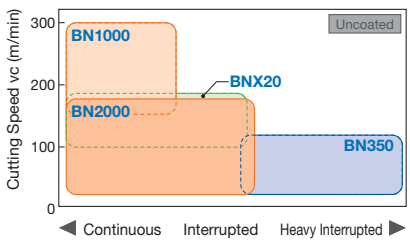
Negative type (With Hole)

Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	Standard	**WNMA 080404**	1	1	0.4	4.5		●											—	—
		080408			0.8	4.4		●											—	—
		080412			1.2	4.3													—	—

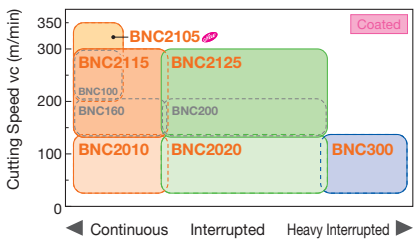
Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.
Cutting Edge Specification Details L32, L33

SUMIBORON Application Range Map

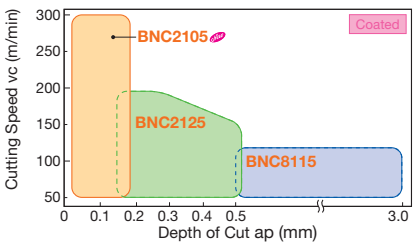
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



W Trigon type

WNGA0804●● Coated

Dimensions (mm)	Inscribed Circle	12.7	Hole Dia.	5.16
	Thickness	4.76		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation / General machining ◕: 1st Recommendation ◔: 2nd Recommendation / Interrupted Cutting ✖: 1st Recommendation ✖: 2nd Recommendation

Recommended Application		Coated SUMIBORON										
		BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
K	Cast Iron										●	✖
S	Exotic Alloy											
H	Hardened Steel	○	●	◕	○	◔	✖					
	Sintered Components											

Applicable External Holders ☞ C42, C43
Applicable Internal Holders ☞ E64, E65

Multi-Cornered One-Use type / Negative (With Hole)

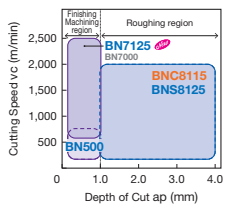
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNC2105	BNC2115	BNC2125	BNC2010	BNC2020	BNC300	BNC100	BNC160	BNC200	BNC500	BNC8115
	Standard	6NC-WNGA 080404	1	6	0.4	2.3		●	●	●	●						—
		6NC-WNGA 080408			0.8	2.0	●	●	●	●	●		●	●	●		—
		6NC-WNGA 080412			1.2	2.0		●	●	●	●						—
	Low Feed Wiper Insert	6NC-WNGA 080408WG	1	6	0.8	2.0		●	●	●	●			●	●		—
	High Feed Wiper Insert	6NC-WNGA 080408WH	1	6	0.8	1.9		●	●	●	●			●	●		—
	L Low Resistance T Negative Land	3NC-WNGA 080408LT	1	3	0.8	2.0	—	—	—	—	●	—	—	—	—	—	—
	L Low Resistance S Negative Land With Honing	3NC-WNGA 080408LS	1	3	0.8	2.0	●	●	●	—	—					—	—
	L Low Resistance S Negative Land With Honing	6NC-WNGA 080408LS	1	6	0.8	2.0	—	—	—	—	—		●	●	●	—	—
	H Strong Edge S Negative Land With Honing	6NC-WNGA 080408HS	1	6	0.8	2.0	—	●	●	●	●		—	●	●		—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible.

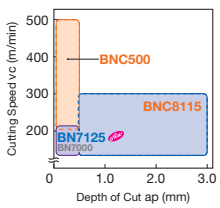
Cutting Edge Specification Details ☞ L32, L33

SUMIBORON Application Range Map

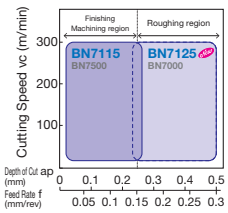
K Gray Cast Iron



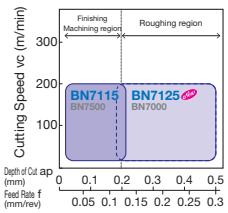
K Ductile Cast Iron



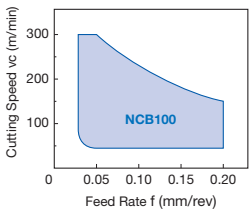
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy



S Titanium Alloy



W Trigon type

Standard cutting edge specification

	BNX10	BNX20	BNX25	BN1000 BN2000	BN350	BNC2105	BNC2115 BNC2125	BNC2010 BNC2020	BNC100 BNC160	BNC200 BNC300
Negative	T01225	S01225	S01725	S01225	T01225	S01225	S01225	S01225	S01225	S01225
Positive					T01235					

	BNC500	BN500	BN7125	BN7000 BN700	BN7115	BN7500	BNC8115	BNS8125	NCB100
Negative	S01215	T01215	T01215	T01215	T01215	T01215	S02020	T02020	T01215
Positive							—	—	

WBEW0601●● Uncoated

Dimensions (mm)	Inscribed Circle	3.97	Hole Dia.	2.2
	Thickness	1.59		

(Legend) Continuous Cutting ●: 1st Recommendation ○: 2nd Recommendation; General machining ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON										BINDERLESS SUMIBORON	
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron						○	◕					✖		
S	Exotic Alloy							●					◕	●	
H	Hardened Steel	○	◔	✱	●	◕	✖								
	Sintered Components							◕				●			

Applicable Internal Holders E62

One-Use type / 5° Positive (With Hole)

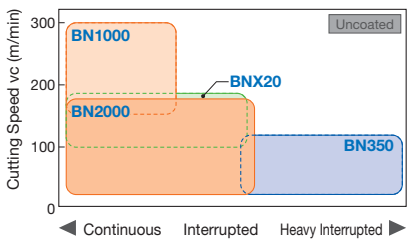
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	L Low Resistance F Sharp Edge	**NU-WBEW 060102L-LF**	1	1	0.2	1.3	—	—	—	—	—	—	—	○	●	▲			—	—
		060104L-LF			0.4	1.2	—	—	—	—	—	—	—						—	—
	L Low Resistance T Negative Land	**NU-WBEW 060102L-LT**	1	1	0.2	1.3	—	●	—	—	—	—	—	—	—	—	—	—	—	—
		060104L-LT			0.4	1.2	—	●	—	—	—	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

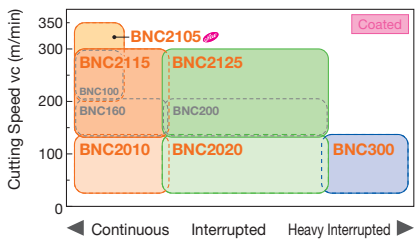
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

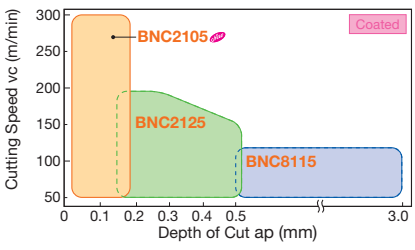
H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Induction Hardened Steel (S45C/S55C, etc.), Carburised Steel



H Bearing Steel (SUJ2, etc.)



○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

W Trigon type

WBEW0802 Uncoated

Dimensions (mm)	Inscribed Circle	4.76	Hole Dia.	2.2
	Thickness	2.38		

(Legend) Continuous Cutting: ●: 1st Recommendation ○: 2nd Recommendation; General machining: ◕: 1st Recommendation ◔: 2nd Recommendation; Interrupted Cutting: ✖: 1st Recommendation ✱: 2nd Recommendation

Recommended Application		Uncoated SUMIBORON												BINDERLESS SUMIBORON
		BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
K	Cast Iron							○	◕					✖	
S	Exotic Alloy								●					◕	●
H	Hardened Steel	○	◔	✱	●	◕	✖								
	Sintered Components								◕			●			

Applicable Internal Holders E62

One-Use type / 5° Positive (With Hole)

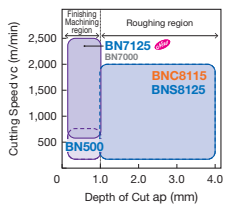
Shape	Cutting Edge Specification	Cat. No.	Pcs/ Pack	No. of Cutting Edges	Corner Radius	Cutting Edge Length	BNX10	BNX20	BNX25	BN1000	BN2000	BN350	BN500	BN7125	BN7000	BN700	BN7115	BN7500	BNS8125	NCB100
	L Low Resistance F Sharp Edge	NU-WBEW 080202L-LF	1	1	0.2	1.7	—	—	—	—	—	—	—						—	—
		080204L-LF			0.4	1.6	—	—	—	—	—	—	—						—	—
	L Low Resistance T Negative Land	NU-WBEW 080202L-LT	1	1	0.2	1.7	—	●	—	—	—	—	—	—	—	—	—	—	—	—
		080204L-LT			0.4	1.6	—	●	—	—	—	—	—	—	—	—	—	—	—	—

Cutting edge treatment differs by grade. Regarding cutting edge specifications not stated above, please contact us to confirm whether manufacturing is possible. Cutting Edge Specification Details L32, L33

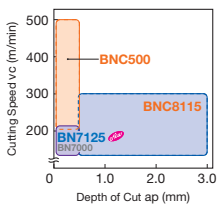
*Depth of cut for one-use types is 0.5mm or less.

SUMIBORON Application Range Map

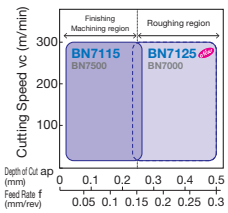
K Gray Cast Iron



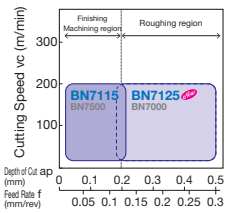
K Ductile Cast Iron



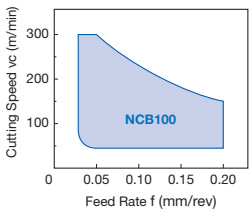
Sintered Alloy General Sintered Alloy



Sintered Alloy High-density Sintered Alloy

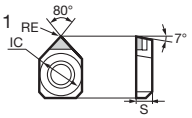


S Titanium Alloy



Turning Inserts

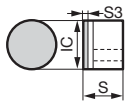
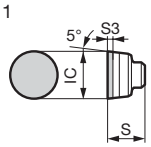
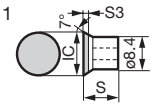
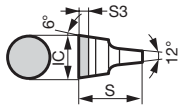
Dimensions (mm)

Shape		Cat. No.	BN1000	BN2000	BNX20	BN350	BNX25	BNX10	BN500	BN7125	BN7000	BN700	Inscribed Circle IC	Thickness S	Corner Radius RE	Hole Dia.	Applicable Holder	Fig
	Fig 1 	**NU-ZNEX 040102**	●	●						○	●	▲	4.76	1.59	0.2	2.3	SUMIBORON Small Dia. Boring Bar (BNZ series) → L135	1
		NU-ZNEX 040104	●	●						○	●	▲	4.76	1.59	0.4	2.3		1
		T-NU-ZNEX 040102		●									4.76	1.59	0.2	2.3		1
		T-NU-ZNEX 040104		●									4.76	1.59	0.4	2.3		1

*Use NS type (NS-ZNEX) for BNX25.
*T-NU-ZNEX is a 10-piece pack.

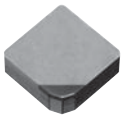
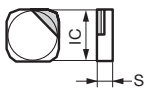
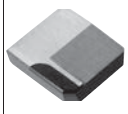
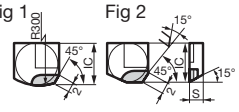
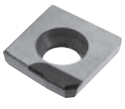
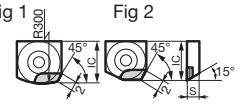
Round Inserts

Dimensions (mm)

Shape		Cat. No.	BN1000	BN2000	BNX20	BN350	BNX25	BNX10	BN500	BN7125	BN7000	BN700	Inscribed Circle IC	Thickness S	Thickness of CBN S3	Applicable Holder	Fig
	Fig 1 	**RNGA 0906M0**		●	●								9.00	6.35	0.80	SUMIBORON Round Insert Holders (PRGN type) → L138	1
	Fig 1 	**RBG 08-B**								○	●		8.00	6.50	0.80		1
		RBG 10-B								○	●		10.00	9.00	0.80	SUMIBORON Tool Holder for Roll Turning (BNRN type) → L139	1
		RBG 12-B								○	●		12.00	11.00	0.80		1
		RBG 16-B								○	●		16.00	13.00	0.80		1
		RBG 20-B								○	●		20.00	15.00	0.80		1
		RBG 26-B								○	●		26.00	15.00	0.80		1
	Fig 1 	**RCGA 0906M0**		●									9.00	6.35	0.80	SUMIBORON Round Insert Holders (PRGC type / PRDC type) → L138	1
	Fig 1 	**RTGN 0508M0**			●								5.00	7.50	0.80	SUMIBORON Small Diameter Round Insert Holders (TRGT series) → L137	1
		RTGN 0608M0			●								6.00	7.50	0.80		1
		RTGN 0711M0			●								7.00	11.0	0.80		1
		RTGN 0811M0			●								8.00	11.0	0.80		1
		RTGN 0914M0			●								9.00	14.0	0.80		1
		RTGN 1014M0			●								10.00	14.0	0.80		1
		RTGN 1214M0			●								12.00	14.0	0.80		1

Milling Inserts

Dimensions (mm)

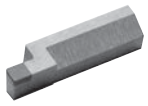
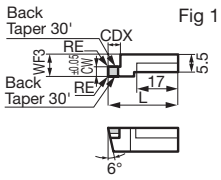
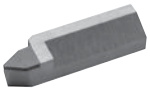
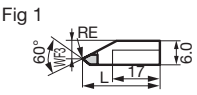
Shape		Cat. No.	BN1000	BN2000	BN7125	BN7000	BN700	Inscribed Circle IC	Thickness S	Applicable Holder	Fig
	Fig 1 	**CSN 43MT**		●				12.70	4.76	SEC-ACE MILL (DNF series) → H47	1
	Fig 1 Fig 2 	**SNEN 1504ADTR**			○	●	▲	15.875	4.76	BN Finish Mill (FM series, FMF series) → L144	1
		SNEN 1504ADTL			○	●	▲	15.875	4.76		1
		SNEN 1504ADTR-S			○	●	▲	15.875	4.76		2
		SNEN 1504ADTL-S			○	●	▲	15.875	4.76		2
	Fig 1 Fig 2 	**SNEW 1203ADTR**			○	●	▲	12.70	3.18	BN Finish Mill EASY (FMU series) → L143	1
		SNEW 1203ADTR-S			○	●	▲	12.70	3.18		2

○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIBORON Inserts

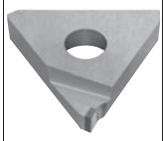
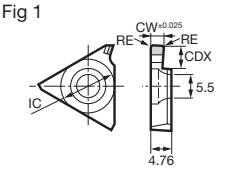
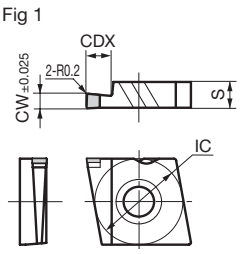
Grooving/Threading Tool Inserts

Dimensions (mm)

Shape (Right-Hand)		Cat. No.	BN2000 R	BN2000 L	BN250 R	BN250 L	BNX20 R	BNX20 L	BN350 R	BN350 L	Groove width CW	Groove depth CDX	Corner Radius RE	Overall Length L	Cutting Edge Distance WF3	Applicable Holder	Fig
	 Fig 1	**BNGNT 0200 R/L**			●				●		2.0	4.0	0.2	25	6.0		1
		BNGNT 0250 R/L			●				●		2.5	4.0	0.2	25	6.0		1
		BNGNT 0300 R/L			●				●		3.0	5.0	0.4	25	6.0	SUMIBORON	1
		BNGNT 0400 R/L			●				●		4.0	6.0	0.4	26	6.0	Grooving Tool	1
		BNGNT 0500 R/L			●				●		5.0	6.0	0.4	26	6.0	(BNGG series)	1
		BNGNT 0600 R/L			●				●		6.0	7.0	0.4	27	6.0	→ L141	1
	 Fig 1	**BNTT 1020 R/L**			●						Pitch = 1.0 to 2.0		0.14	25	4.0	SUMIBORON	1
		BNTT 1530 R/L			●						Pitch = 1.5 to 3.0		0.20	25	4.0	Grooving Tool (BNGG series) → L141	1

Inserts for Grooving Tool Holders

Dimensions (mm)

Shape		Cat. No.	BN2000 R	BN2000 L	BNC30G R	BNC30G L	Inscribed Circle IC	Width of Cut CW	Corner Radius RE	Groove depth CDX	Hole Dia.	Applicable Holder	Fig
	 Fig 1	**TGA R/L4125**	●		—	—	12.70	1.25	0.2	2.0	5.5		1
		TGA R/L4150	●		—	—	12.70	1.50	0.2	3.5	5.5	SEC-Grooving Tool	1
		TGA R/L4200	●		—	—	12.70	2.00	0.2	3.5	5.5	(GWC series,	1
		TGA R/L4250	●		—	—	12.70	2.50	0.2	4.0	5.5	GWCS type,	1
		TGA R/L4300	●		—	—	12.70	3.00	0.2	4.0	5.5	GWCI type)	1
		TGA R/L4350	●		—	—	12.70	3.50	0.2	5.0	5.5	→ F4 to F5	1
		TGA R/L4400	●		—	—	12.70	4.00	0.2	5.0	5.5		1
	 Fig 1	**CGA R/L 1504150**	●	●	●	●	15.875	1.5	0.2	3.5	5.5		1
		CGA R/L 1504200	●	●	●	●	15.875	2.0	0.2	3.5	5.5		1
		CGA R/L 1504250	●	●	●	●	15.875	2.5	0.2	4.0	5.5		1
		CGA R/L 1504300	●	●	●	●	15.875	3.0	0.2	4.0	5.5	SUMIBORON	1
		CGA R/L 1504350	●	●	●	●	15.875	3.5	0.2	5.0	5.5	Grooving Tool	1
		CGA R/L 1504400	●	●	●	●	15.875	4.0	0.2	5.0	5.5	(GWB series)	1
		CGA R/L 1504450	●	●	●	●	15.875	4.5	0.2	5.0	5.5	→ L140	1
		CGA R/L 1506500	●	●	●	●	15.875	5.0	0.2	5.0	5.5		1
		CGA R/L 1506550	●	●	●	●	15.875	5.5	0.2	5.0	5.5		1
		CGA R/L 1506600	●	●	●	●	15.875	6.0	0.2	5.0	5.5		1

Solid SUMIBORON

Indexable Inserts (Solid CBN type)

Refer to pages L122 to L125 for solid SUMIBORON dedicated holders.

Applications K Cast Iron H Hardened Steel

Shape	Cat. No.	BNC8115	BNS8125	Dimensions (mm) Inscribed Circle	Thickness	Corner Radius	Hole	Applicable Holder
80° Diamond type	CNGN 090308	●	●	9.525	3.18	0.8	No	External Dia. L123
	CNGN 090308LF			9.525	3.18	0.8	No	
	CNGN 090312	●	●	9.525	3.18	1.2	No	
	CNGN 090312LF			9.525	3.18	1.2	No	
	CNGN 120408	●	●	12.70	4.76	0.8	No	External Dia. L123
	CNGN 120412	●	●	12.70	4.76	1.2	No	
	CNGN 120416	●	●	12.70	4.76	1.6	No	
	CNGA 120408	●	●	12.70	4.76	0.8	Yes	External Dia. C10 ~ C12; Internal Dia. E15, E23 ~ E25
	CNGA 120412	●	●	12.70	4.76	1.2	Yes	
	CNGX 120408			12.70	4.76	0.8	Dimple	External Dia. L125
	CNGX 120412	●	●	12.70	4.76	1.2	Dimple	
	CNGX 120416	●	●	12.70	4.76	1.6	Dimple	
55° Diamond type	DNGN 110308	●	●	9.525	3.18	0.8	No	External Dia. L123
	DNGN 110308LF			9.525	3.18	0.8	No	
	DNGN 110312	●	●	9.525	3.18	1.2	No	
	DNGN 110312LF			9.525	3.18	1.2	No	
Round type	RNGN 090300	●	●	9.525	3.18	-	No	External Dia. L124
	RNGN 090300LF			9.525	3.18	-	No	
	RNGN 120300	●	●	12.70	3.18	-	No	External Dia. L124
	RNGN 120300LF			12.70	3.18	-	No	
	RNGN 120400	●	●	12.70	4.76	-	No	
Square type	SNGN 090308	●	●	9.525	3.18	0.8	No	External Dia. L122; Milling Cutters H251 L145
	SNGN 090308LF			9.525	3.18	0.8	No	
	SNEN 090308W	●	●	9.525	3.18	0.8	No	
	SNEN 090308LFW			9.525	3.18	0.8	No	
	SNGN 090312	●	●	9.525	3.18	1.2	No	
	SNGN 090312LF			9.525	3.18	1.2	No	
	SNGN 120308	●	●	12.70	3.18	0.8	No	External Dia. L122
	SNGN 120308LF			12.70	3.18	0.8	No	
	SNGN 120312	●	●	12.70	3.18	1.2	No	
	SNGN 120312LF			12.70	3.18	1.2	No	
	SNGN 120408	●	●	12.70	4.76	0.8	No	External Dia. L122
	SNGN 120412	●	●	12.70	4.76	1.2	No	
	SNGN 120416	●	●	12.70	4.76	1.6	No	
	SNGN 120420	●	●	12.70	4.76	2.0	No	
	SNGA 120408	●	●	12.70	4.76	0.8	Yes	External Dia. C21 ~ C26; Internal Dia. E39 ~ E41
	SNGA 120412	●	●	12.70	4.76	1.2	Yes	
	SNGX 120408			12.70	4.76	0.8	Dimple	External Dia. L125
	SNGX 120412	●	●	12.70	4.76	1.2	Dimple	
	SNGX 120416	●	●	12.70	4.76	1.6	Dimple	
Triangular type	TNGN 110308	●	●	6.35	3.18	0.8	No	External Dia. L122
	TNGN 110308LF			6.35	3.18	0.8	No	
	TNGN 110312	●	●	6.35	3.18	1.2	No	
	TNGN 110312LF			6.35	3.18	1.2	No	
	TNGN 160408	●	●	9.525	4.76	0.8	No	External Dia. L122
	TNGN 160412	●	●	9.525	4.76	1.2	No	
	TNGN 160416	●	●	9.525	4.76	1.6	No	
	TNGN 160420	●	●	9.525	4.76	2.0	No	
	TNGA 160408	●	●	9.525	4.76	0.8	Yes	External Dia. C29 ~ C35; External Dia. D16 D20; Internal Dia. E15, E47 ~ E49
	TNGA 160412	●	●	9.525	4.76	1.2	Yes	

*Part number suffix: LF: Sharp edged W: Wiper type LFW: Wiper sharp edged

● mark: Standard stocked item (new product/expanded item)

MEMO

Tool Holders for Solid SUMIBORON

For general Turning
Clamp-on

CSBN/FN11
External Turning

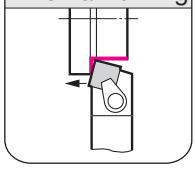


Fig 1

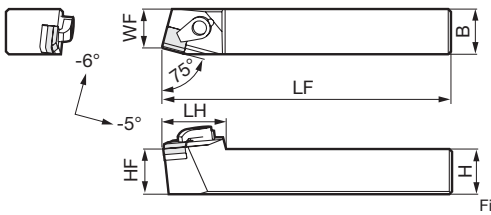
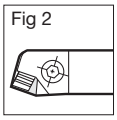
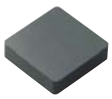


Figure shows right-handed (R) tool.

Fig 2



Insert L120



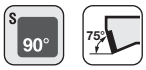
(1) SNGN0903○○
(2) SNGN1203○○
(3) SNGN1204○○

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig	Clamp Plate	Chipbreaker	Double Screw	Bolt	Shim	Shim Retainer	Spring	Wrench
CSBN R/L2525-32	●		25	25	160	21.5	25	30	SNGN0903○○	1	CCM8UL	CBS13	WB8-22T	—	SSN0903	SPP3	—	LT27
R/L2525-42	●		25	25	160	21.5	25	35	SNGN1203○○	1		CBS14			SSND423			
FN11 R/L-44A	●	●	25	25	160	21.5	25	33	SNGN1204○○	2	DCR/L1	CBD4R/L	—	BH0830R/L			DSP5	LH040



Facing
Clamp-on

CSKN
Facing

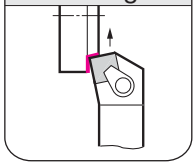


Fig 1

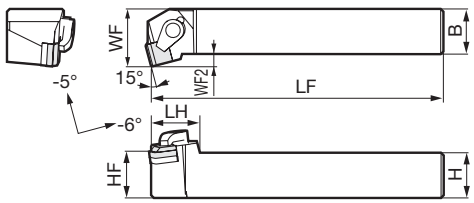


Figure shows right-handed (R) tool.

Insert L120

(1) SNGN0903○○
(2) SNGN1203○○

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Inserts	Fig	Clamp Plate	Chipbreaker	Double Screw	Shim	Shim Retainer	Wrench
CSKN R/L2525-32	●		25	25	160	32	25	25	7	SNGN0903○○	1	CCM8UL	CBS13	WB8-22T	SSN0903	SPP3	LT27
R/L2525-42	●		25	25	160	32	25	25	7	SNGN1203○○	1		CBS14		SSND423		

General Turning
Clamp-on

CTGN/FN21
External Turning

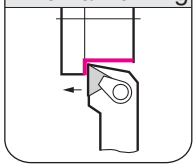


Fig 1

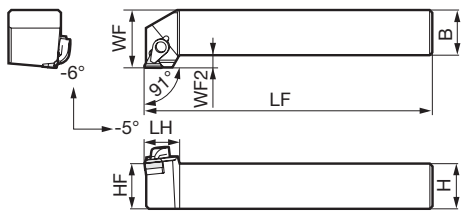
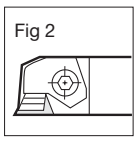


Figure shows right-handed (R) tool.

Fig 2



Insert L120

(1) TNGN1103○○
(2) TNGN1604○○

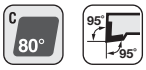
Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Inserts	Fig	Clamp Plate	Chipbreaker	Double Screw	Bolt	Shim	Shim Retainer	Spring	Wrench
CTGN R/L2525-22	●		25	25	160	32	25	20	7	TNGN1103○○	1	CCM6UL	CBT12	WB6-16T	—	STN1103	SPP3	—	LT20
FN21 R/L-44A	●	●	25	25	160	25	25	32	—	TNGN1604○○	2	DCR/L2	CBD4R/L	—	BH0830R/L	STND323		DSP5	LH040

Tool Holders for Solid SUMIBORON



General Turning and Facing
Clamp-on

CCLN/FCLN

External Diameter/Facing

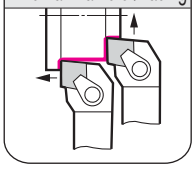


Fig 1

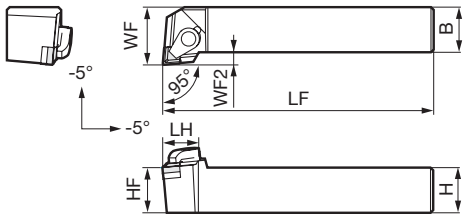


Fig 2

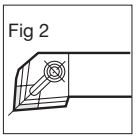


Figure shows right-handed (R) tool.

Insert L120

(1) CNGN0903○○
(2) CNGN1204○○

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Offset	Applicable Inserts	Fig	Clamp Plate	Chipbreaker	Double Screw	Shim	Shim Retainer	Wrench
	R	L	H	B	LF	WF	HF	LH	WF2								
CCLN R/L2525-32	●		25	25	150	32	25	25	7	CNGN0903○○	1	CCM8UL	CBC0903	WB8-22T	SCN0903	SPP3	LT27
FCLN R/L2525-43	●	●	25	25	150	32	25	30	7	CNGN1204○○	2	CCM8-LONG	CBC4	WB8-30	SCND433		LH040

General Turning and Profiling
Clamp-on

CDJN

External Diameter/Profiling

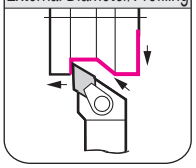


Fig 1

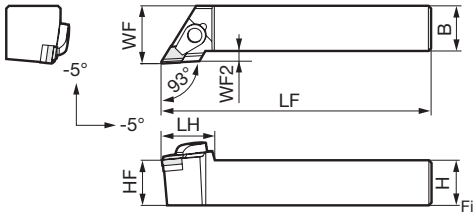


Figure shows right-handed (R) tool.

Insert L120

(1) DNGN1103○○

Holder

Parts

Dimensions (mm)

Cat. No.	Stock		Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Offset	Applicable Inserts	Fig	Clamp Plate	Chipbreaker	Double Screw	Shim	Shim Retainer	Wrench
	R	L	H	B	LF	WF	HF	LH	WF2								
CDJN R/L2525-32	●		25	25	150	32	25	30	7	DNGN1103○○	1	CCM8UL	CBD1103	WB8-22T	SDN1103	SPP3	LT27

Tool Holders for Solid SUMIBORON

R

General Turning and Profiling
Clamp-on

CRDN
External Diameter/Profiling

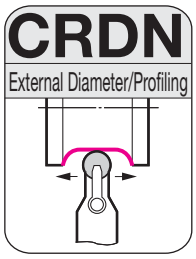
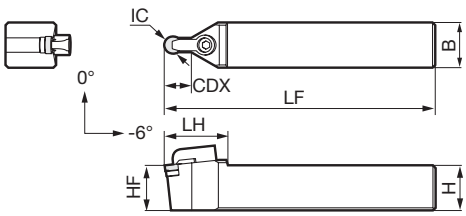


Fig 1



Insert L120

(1) RNGN090300
(2) RNGN120300
(3) RNGN120400

Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge Height HF	Head LH	Depth of Cut CDX	Applicable Inserts	Fig	Clamp Plate	Double Screw	Shim	Shim Retainer	Wrench
CRDN N2525-32	●	9.525	25	25	150	25	35	15	RNGN090300	1	CCM8-LONG	WB8-22T	SRND32	SPP3	LT27
N2525-42	●	12.7	25	25	150	25	35	20	RNGN120300	1			SRND42		
N2525-43	●	12.7	25	25	150	25	35	20	RNGN120400	1					

R

General Turning and Facing
Clamp-on

CRSN
External Diameter/Facing

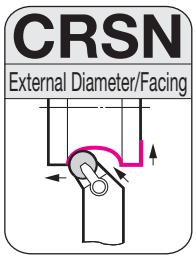


Fig 1

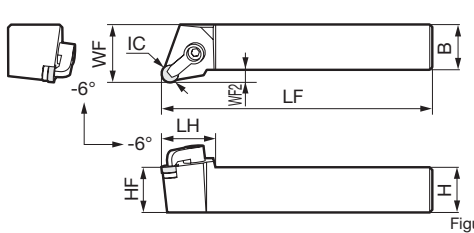


Figure shows right-handed (R) tool.

Insert L120

(1) RNGN090300
(2) RNGN120300
(3) RNGN120400

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Inserts	Fig	Clamp Plate	Double Screw	Shim	Shim Retainer	Wrench
CRSN R/L2525-32	●		9.525	25	25	150	32	25	30	7	RNGN090300	1	CCM8-LONG	WB8-22T	SRND32	SPP3	LT27
R/L2525-42	●		12.7	25	25	150	32	25	30	7	RNGN120300	1			SRND42		
R/L2525-43	●		12.7	25	25	150	32	25	30	7	RNGN120400	1					

Tool Holders for Solid SUMIBORON

General Turning
Dimple Lock

XSBN
External Turning

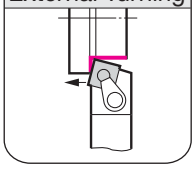


Fig 1

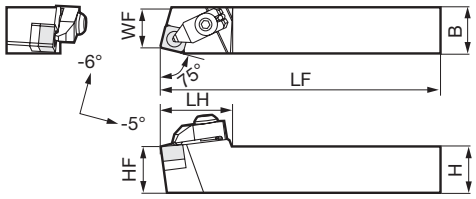
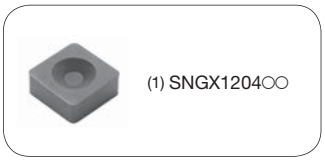


Figure shows right-handed (R) tool.

Insert L120

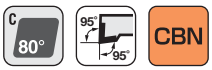


Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig	Clamp Plate	Bolt	Shim	Shim Retainer	Spring	Wrench
XSBN R/L2525-43	●		25	25	150	21.5	25	38	SNGX1204○○	1	DSLX8	BH0825	SSND433	SPP3	GSP10	LH050



General Turning and Facing
Dimple Lock

XCLN
External Diameter/Facing

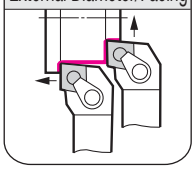


Fig 1

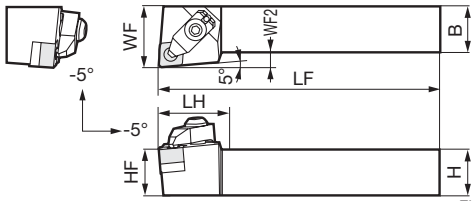
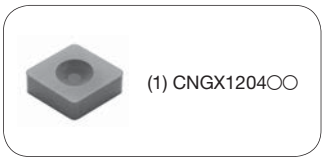


Figure shows right-handed (R) tool.

Insert L120



Holder

Parts

Dimensions (mm)

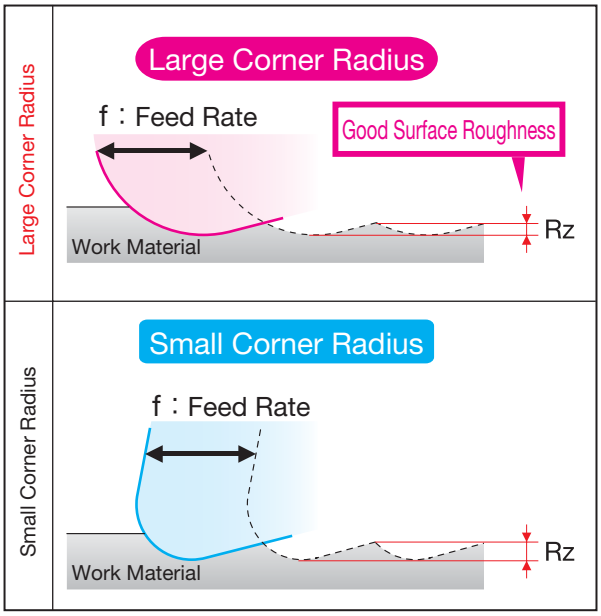
Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Offset WF2	Applicable Inserts	Fig	Clamp Plate	Bolt	Shim	Shim Retainer	Spring	Wrench
XCLN R/L2525-43	●		25	25	150	32	25	33	7	CNGX1204○○	1	DSLX8	BH0825	SCND433	SPP3	GSP10	LH050

Inserts & Special Holders for High-efficiency Machining

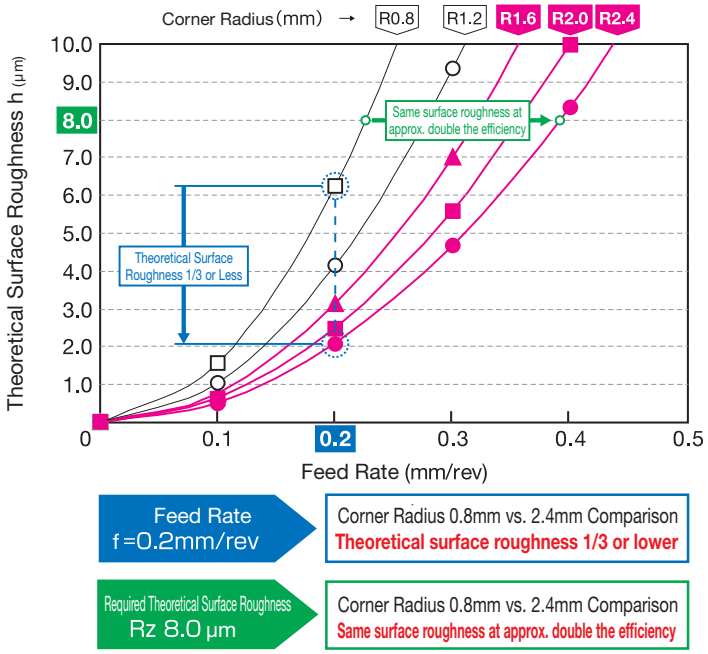
■ Features

- Improved finished surface roughness with high-feed cutting
- Ideal for profiling when surface roughness is required

● Operation with different corner radii

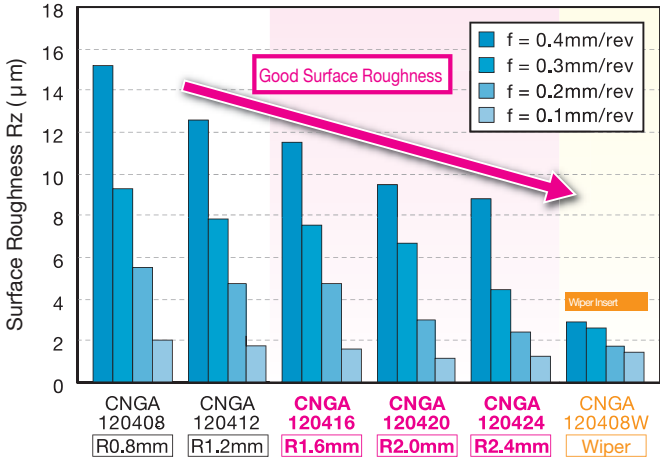


● Comparison of Theoretical Surface Roughness



* Actual value of surface roughness is approximately 1.5 to 3 times higher (for steel)
* Theoretical surface roughness is calculated using the following formula: [$h = (f^2 / 8r) \times 10^3$].

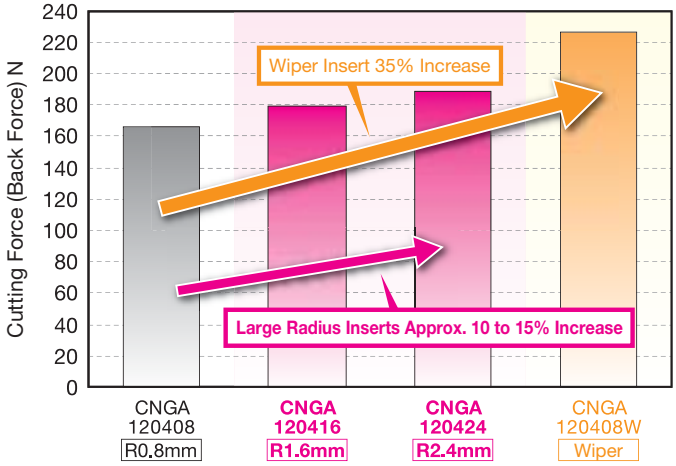
● Machined surface roughness comparison with different corner radii



Inserts with a larger corner radius also give better surface roughness during actual machining

Work Material: SCM415H (60HRC)
Cutting Conditions: vc = 100m/min, ap = 0.1mm Dry

● Cutting force comparison with different corner radii



Low cutting force compared to wiper insert enables high-feed cutting

Work Material: SCM415H (60HRC)
Cutting Conditions: vc = 150m/min, f = 0.3mm/rev, ap = 0.1mm Dry

Inserts & Special Holders for High-efficiency Machining

C 80° | 95° | 95° | CBN

DCLN
External Turning and Facing

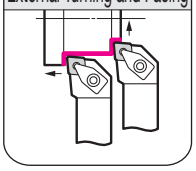


Fig 1

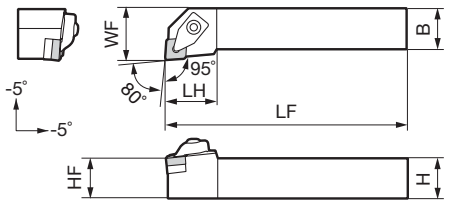


Figure shows right-handed (R) tool.

Insert L129

(1) 2NC-CNGA120416 (4) 4NC-CNGA120416
(2) 2NC-CNGA120420 (5) 4NC-CNGA120420
(3) 2NC-CNGA120424 (6) 4NC-CNGA120424

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
DCLN R/L 2525M12-R24	●	●	25	25	150	32	25	32		1							
R/L 3225P12-R24	●		32	25	170	32	32	32	○NC-CNGA1204○○	1	SCP-2	5.0	CNS1204-R24	BFTX0409N	TRX15 (*1)	LH040	LH025
R/L 3232P12-R24	●		32	32	170	40	32	32		1							

*Dedicated holder for 1.6mm / 2.0mm / 2.4mm corner radius inserts. Other sizes cannot be used.
*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

D 55° | 93° | CBN

DDJN
External/Profiling

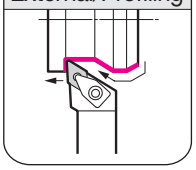


Fig 1

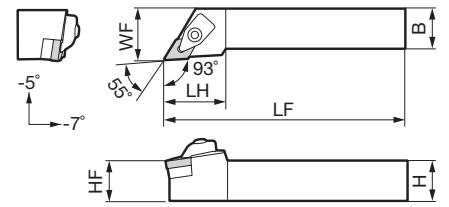
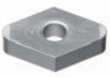


Figure shows right-handed (R) tool.

Insert L129



(1) 2NC-DNGA150416 (4) 4NC-DNGA150416
(2) 2NC-DNGA150420 (5) 4NC-DNGA150420
(3) 2NC-DNGA150424 (6) 4NC-DNGA150424

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
DDJN R/L 2525M15-R24	●	●	25	25	150	32	25	32		1							
R/L 3225P15-R24	●		32	25	170	32	32	38	○NC-DNGA1504○○	1	SCP-2	5.0	DNS1504-R24	BFTX0409N	TRX15 (*1)	LH040	LH025
R/L 3232P15-R24	●		32	32	170	40	32	38		1							

*Dedicated tool holder for 1.6mm / 2.0mm / 2.4mm corner radius inserts. Other sizes cannot be used.
*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

D 55° | 107.5° | CBN

DDHN
External/Profiling

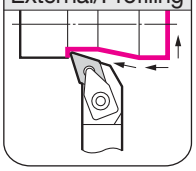


Fig 1

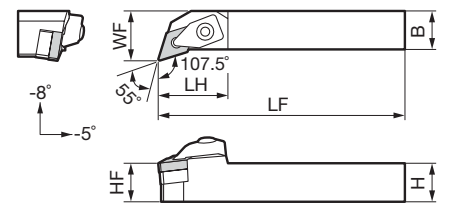
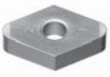


Figure shows right-handed (R) tool.

Insert L129



(1) 2NC-DNGA150416 (4) 4NC-DNGA150416
(2) 2NC-DNGA150420 (5) 4NC-DNGA150420
(3) 2NC-DNGA150424 (6) 4NC-DNGA150424

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
DDHN R/L 2525M15-R24	●	●	25	25	150	35	25	35	○NC-DNGA1504○○	1	SCP-2	5.0	DNS1504-R24	BFTX0409N	TRX15 (*1)	LH040	LH025

*Dedicated tool holder for 1.6mm / 2.0mm / 2.4mm corner radius inserts. Other sizes cannot be used.
*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

N·m Recommended Tightening Torque (N·m)

Inserts & Special Holders for High-efficiency Machining

D 55° 63° CBN

DDNN
External/Profiling

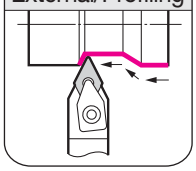


Fig 1

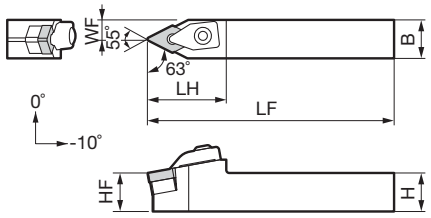
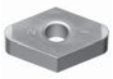


Figure shows right-handed (R) tool.

Insert L129



(1) 2NC-DNGA150416 (4) 4NC-DNGA150416
(2) 2NC-DNGA150420 (5) 4NC-DNGA150420
(3) 2NC-DNGA150424 (6) 4NC-DNGA150424

Holder / Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
DDNN N 2525M15-R24	●	25	25	150	13	25	40	○NC-DNGA1504○○	1	SCP-2	5.0	DNS1504-R24	BFTX0409N	TRX15 (*1)	LH040	LH025

*Dedicated holder for 1.6mm / 2.0mm / 2.4mm corner radius inserts. Other sizes cannot be used.
*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

T 60° 91° CBN

DTGN
External Turning

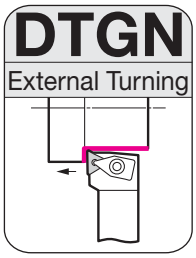


Fig 1

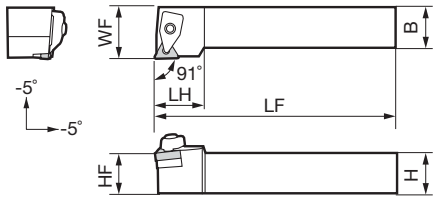


Figure shows right-handed (R) tool.

Insert L129

(1) 3NC-TNGA160416 (4) 6NC-TNGA160416
(2) 3NC-TNGA160420 (5) 6NC-TNGA160420
(3) 3NC-TNGA160424 (6) 6NC-TNGA160424

Holder / Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
DTGN R/L 2525M16-R24	●	●	25	25	150	32	25	32		1							
R/L 3225P16-R24	●		32	25	170	32	32	32	○NC-TNGA1604○○	1	SCP-1	5.0	TNS1604-R24	BFTX0307N	TRX10 (*1)	LH040	LH025
R/L 3232P16-R24	●		32	32	170	40	32	32		1							

*Dedicated holder for 1.6mm / 2.0mm / 2.4mm corner radius inserts. Other sizes cannot be used.
*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

T 60° 91° CBN

DTFN
Facing

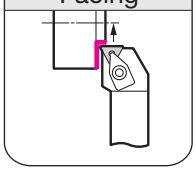


Fig 1

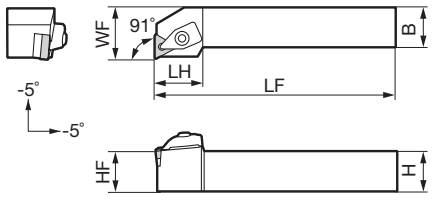


Figure shows right-handed (R) tool.

Insert L129

(1) 3NC-TNGA160416 (4) 6NC-TNGA160416
(2) 3NC-TNGA160420 (5) 6NC-TNGA160420
(3) 3NC-TNGA160424 (6) 6NC-TNGA160424

Holder / Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge WF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig	Clamp Set	N·m	Shim	Shim Screw	Wrench for Shims	Top Hex Wrench	Bottom Hex Wrench
DTFN R/L 2525M16-R24	●	●	25	25	150	32	25	30	○NC-TNGA1604○○	1	SCP-1	5.0	TNS1604-R24	BFTX0307N	TRX10 (*1)	LH040	LH025

*Dedicated holder for 1.6mm / 2.0mm / 2.4mm corner radius inserts. Other sizes cannot be used.
*1 Wrench for shim is sold separately from the main body.

Clamp Set Parts C48

N·m Recommended Tightening Torque (N·m)

Inserts & Special Holders for High-efficiency Machining

Single-Sided Insert type (SUMIBORON)

Dimensions (mm)

Appearance	Cat. No.	No. of Cutting Edges	BNC2115	BNC2125	BNC2010	BNC2020	BNC160	BNC200	BNC300	Corner Radius	CBN Cutting Edge Length	Inscribed Circle	Thickness	Hole Dia.
	2NC-CNGA 120416	2			●	●	●	●	●	1.6	3.3	12.7	4.76	5.16
	120420	2			●	●	●	●	●	2.0	3.2	12.7	4.76	5.16
	120424	2			●	●	●	●	●	2.4	3.1	12.7	4.76	5.16
	2NC-DNGA 150416	2			●	●	●	●	●	1.6	3.4	12.7	4.76	5.16
	150420	2			●	●	●	●	●	2.0	3.0	12.7	4.76	5.16
	150424	2			●	●	●	●	●	2.4	2.7	12.7	4.76	5.16
	3NC-TNGA 160416	3			●	●	●	●	●	1.6	3.3	9.525	4.76	3.81
	160420	3			●	●	●	●	●	2.0	3.0	9.525	4.76	3.81
	160424	3			●	●	●	●	●	2.4	2.7	9.525	4.76	3.81

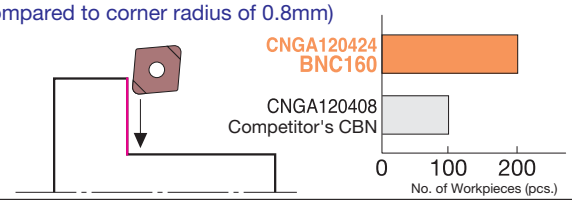
Double-Sided Insert type (SUMIBORON)

Dimensions (mm)

Appearance	Cat. No.	No. of Cutting Edges	BNC2115	BNC2125	BNC2010	BNC2020	BNC160	BNC200	BNC300	Corner Radius	CBN Cutting Edge Length	Inscribed Circle	Thickness	Hole Dia.
	4NC-CNGA 120416	4	●	●	●	●	●	●	●	1.6	3.3	12.7	4.76	5.16
	120420	4	●	●	●	●	●	●	●	2.0	3.2	12.7	4.76	5.16
	120424	4	●	●	●	●	●	●	●	2.4	3.1	12.7	4.76	5.16
	4NC-DNGA 150416	4	●	●	●	●	●	●	●	1.6	3.4	12.7	4.76	5.16
	150420	4	●	●	●	●	●	●	●	2.0	3.0	12.7	4.76	5.16
	150424	4	●	●	●	●	●	●	●	2.4	2.7	12.7	4.76	5.16
	6NC-TNGA 160416	6	●	●	●	●	●	●	●	1.6	3.3	9.525	4.76	3.81
	160420	6	●	●	●	●	●	●	●	2.0	3.0	9.525	4.76	3.81
	160424	6	●	●	●	●	●	●	●	2.4	2.7	9.525	4.76	3.81

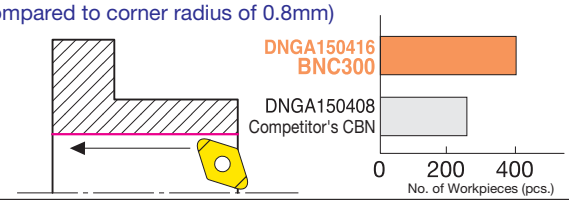
Application Examples (For Automotive Components)

Corner radius of 2.4mm achieves 2x greater tool life
(compared to corner radius of 0.8mm)



Work Material: Carburised Steel (60HRC)
Cutting Conditions: [R2.4] vc = 120m/min, f = 0.35mm/rev, ap = 0.2mm
[R0.8] vc = 120m/min, f = 0.20mm/rev, ap = 0.2mm

Corner radius of 1.6mm achieves 1.5x greater tool life
(compared to corner radius of 0.8mm)

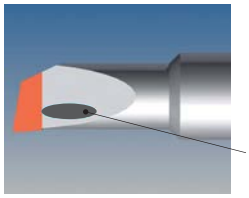
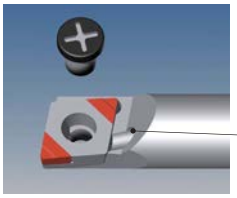


Work Material: Carburised Steel (60HRC)
Cutting Conditions: vc = 100m/min, f = 0.15mm/rev, ap = 0.1mm

BSME series / SEXC series

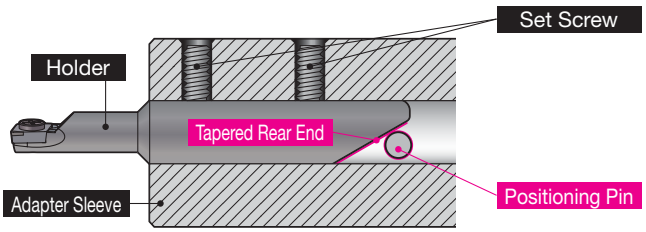
■ Features

- For internal boring of hardened steel with min. bore diameters from ø2.5mm.
- Achieves high-precision cutting edge positioning thanks to the newly developed clamp mechanism.
- Realises high-efficiency machining by switching from grinding to cutting in the small diameter range.
- Brazed type BSME series
  Can be used with bore diameters from ø2.5 to 5.0mm.
- Indexable Insert type SEXC series
  Can be used with bore diameters from ø4.0 to 6.0mm.
  Expansion of coated carbide and cermet grades.
- Economical 2-cornered insert.

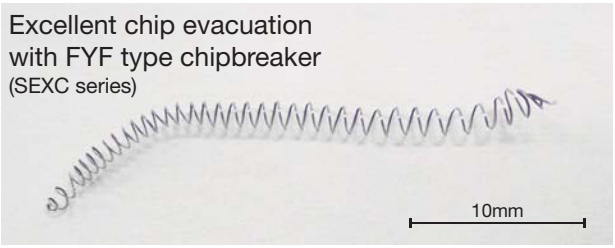
Brazed CBN type BSME series	Indexable Insert type SEXC series
Min. Bore Dia.: ø2.5 to 5.0mm	Min. Bore Dia.: ø4.0 to 6.0mm
High-quality, unique cutting edge shape  Internal Coolant Supply (Standard)	2-cornered insert used  Internal Coolant Supply (Standard)

Clamp Mechanism

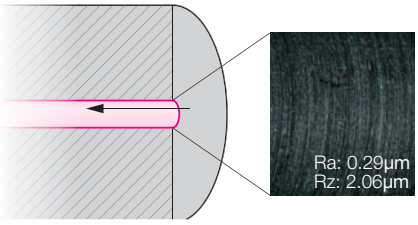
Achieves high-precision cutting edge positioning by combining a holder with a tapered rear end and a sleeve with an internal positioning pin.
(common to BSME and SEXC series)



Excellent chip evacuation with FYF type chipbreaker
(SEXC series)



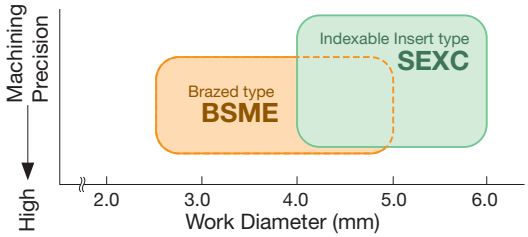
Excellent machined surface quality with cermet grade
(SEXC series)



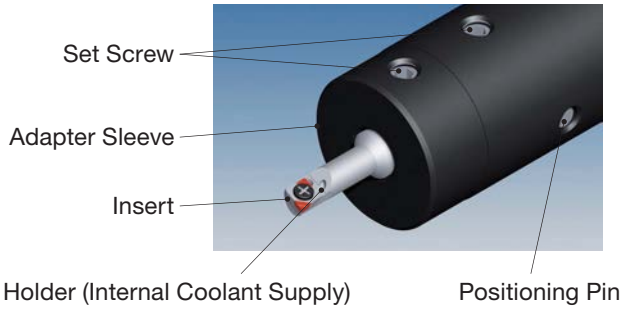
Work Material: SUS304 Internal Boring, Insert: ECEM 03X102L-FYF (AC1030U)
Cutting Conditions: vc = 100m/min, f = 0.05mm/rev, ap = 0.03mm, Work Dia.: ø4

Work Material: SCM415 Internal Boring, Insert: ECEM 03X102L-FYF (T1500A)
Cutting Conditions: vc = 100m/min f = 0.03mm/rev ap = 0.03mm

Application Range



Basic Configuration



BSME series

CBN

SUMIBORON
Brazed

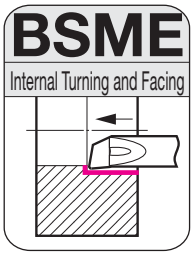


Fig 1

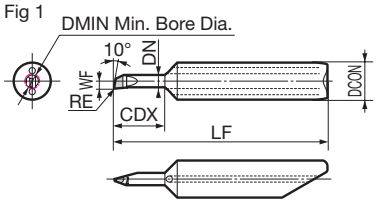
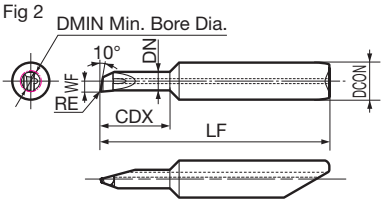


Fig 2



SumiSmall

Holder (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000 R	BN2000 L	Min. Bore Dia. DMIN	Shank Diameter DCON	Neck Diameter DN	Overall Length LF	Cutting Edge Distance WF	Maximum Boring Depth CDX	Corner Radius RE	Applicable Sleeve	Fig
BSME R/L25020D2S6	●	●	**2.5**	6.0	2.0	32.0	1.20	5.3	0.2		1
BSME R/L25020D3S6	●	●	**2.5**	6.0	2.0	34.5	1.20	7.8	0.2		1
BSME R/L25020D4S6			**2.5**	6.0	2.0	37.0	1.20	10.3	0.2		1
BSME R/L30020D2S6	●	●	**3.0**	6.0	2.5	32.8	1.45	6.3	0.2		2
BSME R/L30020D3S6	●	●	**3.0**	6.0	2.5	35.8	1.45	9.3	0.2		2
BSME R/L30020D4S6			**3.0**	6.0	2.5	38.8	1.45	12.3	0.2		2
BSME R/L35020D2S6	●	●	**3.5**	6.0	3.0	33.5	1.70	7.3	0.2		2
BSME R/L35020D3S6	●	●	**3.5**	6.0	3.0	37.0	1.70	10.8	0.2		2
BSME R/L35020D4S6			**3.5**	6.0	3.0	40.5	1.70	14.3	0.2	HBSM6020	2
BSME R/L40020D2S6	●	●	**4.0**	6.0	3.5	33.9	1.95	8.3	0.2	HBSM6020A	2
BSME R/L40020D3S6	●	●	**4.0**	6.0	3.5	37.9	1.95	12.3	0.2		2
BSME R/L40020D4S6			**4.0**	6.0	3.5	41.9	1.95	16.3	0.2		2
BSME R/L45020D2S6	●	●	**4.5**	6.0	4.0	35.0	2.20	9.3	0.2		2
BSME R/L45020D3S6	●	●	**4.5**	6.0	4.0	39.5	2.20	13.8	0.2		2
BSME R/L45020D4S6			**4.5**	6.0	4.0	44.0	2.20	18.3	0.2		2
BSME R/L50020D2S6	●	●	**5.0**	6.0	4.5	35.8	2.45	10.3	0.2		2
BSME R/L50020D3S6	●	●	**5.0**	6.0	4.5	40.8	2.45	15.3	0.2		2
BSME R/L50020D4S6			**5.0**	6.0	4.5	45.8	2.45	20.3	0.2		2

The BSME series requires HBSM6020(A) adapter sleeve (sold separately).

Identification Code

BSM	E	R	350	20	D2	S6
Series Code	Carbide Shank with Oil Hole	Feed Direction	Min. Bore Dia.	Cutting Edge Corner Radius	L/D	Shank Dia.

Fig 1

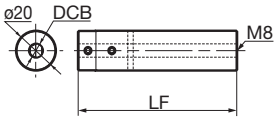
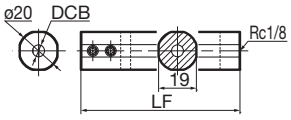


Fig 2



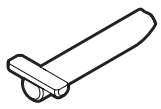
Sleeve (Sold Separately)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Overall Length LF	Fig	Set Screw	Wrench
HBSM6020	●	6.0	80	1	BT0506	TH025
HBSM6020A	●	6.0	80	2		

Mounting Method L133

Alignment Jig (Sold Separately) For HBSM6020 Sleeve

Cat. No.	Stock	
AFBSM60	●	

This jig is used for centring sleeves when setting them into sleeve holders.

Recommended Cutting Conditions

Work Material	H Hardened Steel	
Spindle Speed n (min^{-1})	Above 2,000	Above 2,000
Depth of Cut ap (mm)	0.01-0.15	0.01-0.15
Feed Rate f (mm/rev)	0.01-0.10	0.01-0.10

May cause chattering or chipping at the cutting edge during low-speed machining.
Excessive depth of cut causes deformation of the tool, which consequently leads to deterioration of dimensional tolerance.

SEXC series

Expansion | Carbide (Coolant Hole) | CBN

Carbide / Cermet / SUMIBORON
Screw-on

SumiSmall

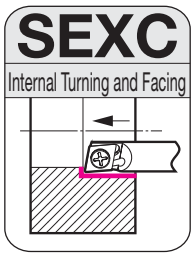
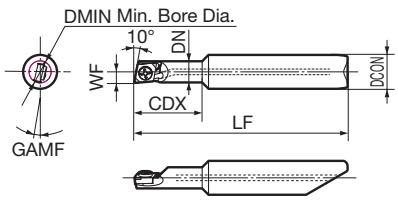


Fig 1



Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Min. Bore Dia. DMIN	Shank Diameter DCON	Neck Diameter DN	Overall Length LF	Cutting Edge Distance WF	Boring Depth CDX	Rake Angle GAMF	Applicable Sleeve	Fig	Bolt	N·m	Wrench
E06D2-SEXC R/L03-04P	●	●	**4.0**	6.0	3.75	33.75	1.95	8	-13°	HBSM6020 HBSM6020A	1	MIB1.6-2	0.2	SDBSM
E06D3-SEXC R/L03-04P	●	●	**4.0**	6.0	3.75	37.75	1.95	12	-13°		1			
E06D2-SEXC R/L03-05P	●	●	**5.0**	6.0	4.75	35.25	2.45	10	-12°		1	MIB1.6-2.5	0.2	
E06D3-SEXC R/L03-05P	●	●	**5.0**	6.0	4.75	40.25	2.45	15	-12°		1			
E06D2-SEXC R/L03-06P	●	●	**6.0**	6.0	5.75	36.75	2.95	12	-11°		1	MIB1.6-3	0.2	
E06D3-SEXC R/L03-06P	●	●	**6.0**	6.0	5.75	42.75	2.95	18	-11°		1			

The SEXC series requires HBSM6020(A) adapter sleeve (sold separately).

Identification Code

E	06	D2	-	S	E	X	C	R	03	-	04	P
Carbide Shank with Oil Hole	Shank Dia.	L/D		Screw-on	Insert Shape	Cutting Edge Shape	Insert Relief Angle	Feed Direction	Insert Inscribed Circle		Min. Bore Dia.	Accessories

Fig 1

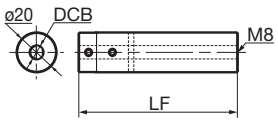
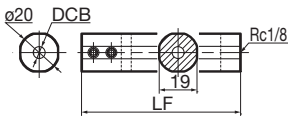


Fig 2



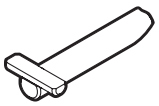
Sleeve (Sold Separately)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Overall Length LF	Fig	Set Screw	Wrench
HBSM6020	●	6.0	80	1	BT0506	TH025
HBSM6020A	●	6.0	80	2		

Mounting Method L133

Alignment Jig (Sold Separately) For HBSM6020 Sleeve

Cat. No.	Stock	
AFBSM60	●	

This jig is used for centring sleeves when setting them into sleeve holders.

Insert (Coated Carbide / SUMIBORON)

Dimensions (mm)

Cat. No.	AC1030U R	AC1030U L	T1500A R	T1500A L	BN2000	BN7000	Corner Radius RE	Fig
ECEM 03X1005 R/L-FYF New	●	●	●	●	—	—	0.05	1
ECEM 03X101 R/L-FYF New	●	●	●	●	—	—	0.1	1
ECEM 03X1015 R/L-FYF New	●	●	●	●	—	—	0.15	1
ECEM 03X102 R/ L-FYF New	●	●	●	●	—	—	0.2	1
2NU-ECXA 030X02 LE	—	—	—	—	●		0.2	2
2NU-ECXA 030X02 LF	—	—	—	—	●	●	0.2	2

Fig 1

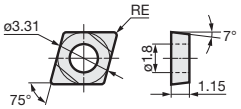
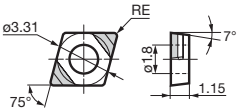


Fig 2



Part Number Suffix: LE: Honed Edge, LF: Sharp Edged, FYF: Sharp Edged (with Chipbreaker)

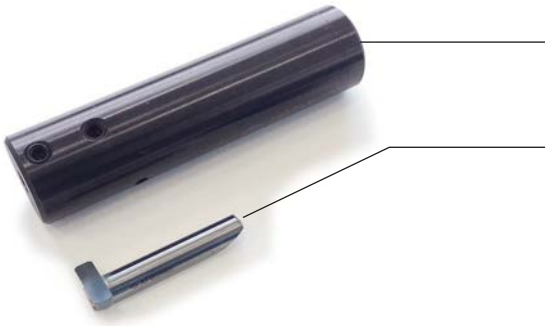
Recommended Cutting Conditions

Work Material	P General Steel		M Stainless Steel		K Cast Iron		N Non-Ferrous Metal		S Exotic Alloy	H Hardened Steel	
Insert Grades	AC1030U	T1500A	AC1030U	T1500A	AC1030U	T1500A	AC1030U	T1500A	AC1030U	BN2000	BN7000
Spindle Speed n (min⁻¹)	2,000-10,000	2,000-10,000	2,000-8,000	2,000-8,000	2,000-10,000	2,000-10,000	5,000-15,000	5,000-15,000	2,000-6,000	Above 2,000	Above 2,000
Depth of Cut ap (mm)	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	up to 0.2	0.01-0.15	0.01-0.15
Feed Rate f (mm/rev)	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	up to 0.05	0.01-0.10	0.01-0.10

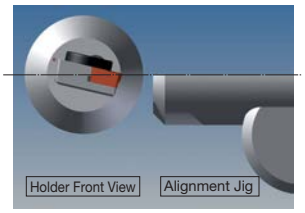
May cause chattering or chipping at the cutting edge during low-speed machining. Excessive depth of cut causes deformation of the tool, which consequently leads to deterioration of dimensional tolerance.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item (new product/expanded item)

■ Dedicated Adapter Sleeve/Alignment Jig

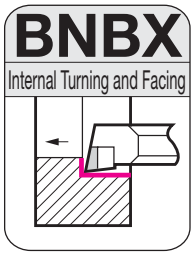


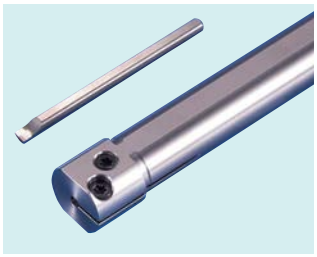
■ Mounting Method (HBSM6020A has a side lock flat, so centring with an alignment jig is not required.)

1	Insert the alignment jig until it hits the positioning pin set in the adapter sleeve, and tighten the two set screws.	(2) Tighten the two set screws (1) Insert until it hits the positioning pin ⟹
2	Mount the sleeve into the sleeve holder and temporarily tighten the fastening screws.	 Holder for Sleeve Temporary screw fastening
3	Rotate the sleeve gradually to adjust until the flat strip of the alignment jig is horizontal. 	When a boring bar is mounted into the sleeve adjusted by the alignment tool, its cutting edge position will automatically be set at the centre.  Holder Front View Alignment Jig
4	Using a tool presetter, measure the diameter of the tool.	

*Steps 1 and 3 above are not required when using HBSM6020A.

BNBX series





- Newly developed high rigidity slit-clamping system, excellent for small hole internal boring
  - Enables maximum overhang of L/D = 5
  - Minimal deformation produces boring with excellent dimensional tolerance
  - Minimal chatter produces superior surface finish
  - Easy bar indexing while clamped
- Lineup now includes BN2000 for hardened steel and BN7125/BN7000 for sintered alloy

Holder (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000	BN7125 (New)	BN7000	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Corner Radius RE	Applicable Sleeve	Fig
BNBX 020R	●	○	●	**2.5**	2.0	1.8	40	0.2	HBX 2016	1
BNBX 025R	●	○	●	**3.0**	2.5	2.2	40	0.2	HBX 2516	1
BNBX 030R	●	○	●	**3.5**	3.0	2.7	40	0.2	HBX 3016	1
BNBX 035R	●	○	●	**4.0**	3.5	3.2	40	0.2	HBX 3516	1
BNBX 040R	●	○	●	**4.5**	4.0	3.7	40	0.2	HBX 4016	1
BNBX 045R	●	○	●	**5.0**	4.5	4.2	40	0.2	HBX 4516	1
BNBX 050R	●	○	●	**5.5**	5.0	4.7	60	0.2	HBX 5016	1
BNBX 055R	●	○	●	**6.0**	5.5	5.2	60	0.2	HBX 5516	1
BNBX 060R	●	○	●	**6.5**	6.0	5.7	60	0.2	HBX 6016	1
BNBX 065R	●			**7.0**	6.5	6.2	60	0.2	HBB 6516	1
BNBX 070R	●			**7.5**	7.0	6.7	80	0.2	HBB 716	1
BNBX 075R	●			**8.0**	7.5	7.2	80	0.2	HBB 7516	1
BNBX 080R	●			**8.5**	8.0	7.7	80	0.2	HBB 816	1

BNBX bars can be used with HBB type sleeves, but HBX type sleeves are recommended for bars below ø6mm.

Fig 1

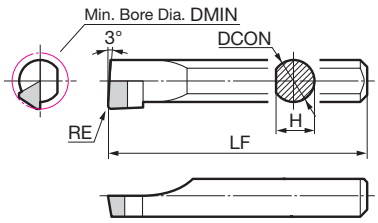


Fig 1

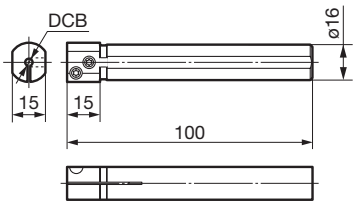
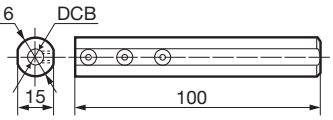


Fig 1



Sleeve (HBX type)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Tool Holder	Fig
HBX 2016	●	2.0	BNBX 020R	1
HBX 2516	●	2.5	BNBX 025R	1
HBX 3016	●	3.0	BNBX 030R	1
HBX 3516	●	3.5	BNBX 035R	1
HBX 4016	●	4.0	BNBX 040R	1
HBX 4516	●	4.5	BNBX 045R	1
HBX 5016	●	5.0	BNBX 050R	1
HBX 5516	●	5.5	BNBX 055R	1
HBX 6016	●	6.0	BNBX 060R	1

Sleeve (HBB type)

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Tool Holder	Fig
HBB 6516	●	6.5	BNBX 065R	1
HBB 716	●	7.0	BNBX 070R	1
HBB 7516	●	7.5	BNBX 075R	1
HBB 816	●	8.0	BNBX 080R	1

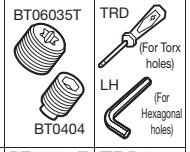
HBB type adapter sleeve can also be used with ø2.5 to 6.0mm holders.

Recommended Cutting Conditions

Spindle Speed n	Above 2,000 min^{-1}	Low speeds may cause chattering and chipping on the cutting edge.
Depth of Cut ap	0.01 to 0.2mm	Excessive depth of cut may cause larger tool deformation, resulting in deterioration of bore accuracy.
Feed Rate f	0.01 to 0.1mm/rev	—

Parts (for Adapter Sleeve)

Applicable Sleeve	Flat Insert Screw	(N·m)	Set Screw	Wrench
HBX2○○○	BFTX0409N	**1.5**	BT06035T	TRD15
HBX3○○○	BFTX0409N	**3.0**	BT06035T	TRD15
HBX4○○○				
HBX5○○○				
HBX6○○○				
HBB○○○○	—	—	BT0404	LH020

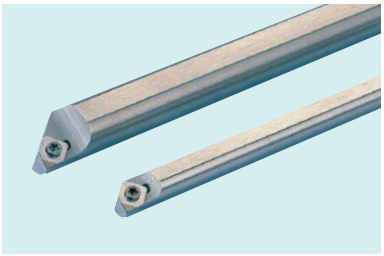


Important Notes

(1) Make the holder overhang as short as possible. (Maximum L/D = 5)
(2) Even minor workpiece runout may affect tool life.
(3) Select a boring bar with a diameter as close to the bore diameter as possible.
(4) Although it is difficult to increase the rotational speed in small-diameter boring applications, higher speeds are recommended whenever possible to extend tool life.

(N·m) Recommended Tightening Torque (N·m) ○ mark: Stock or planned stock (please confirm stock availability)

BNZ series



- ø7mm minimum bore diameter with special one-use insert
- High-rigidity indexable type boring bar with all-cemented carbide shank and powerful clamp
- Economical and easy tool management with one-use type inserts

Expansion | T 60° | 95° | CBN

SUMIBORON
Screw-on

SumiSmall

BNZ
Internal Turning and Facing

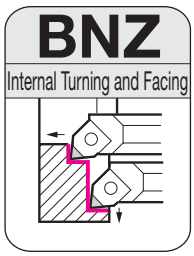
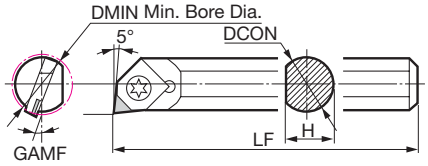


Fig 1



Holder

Dimensions (mm)

Cat. No.	Stock	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Rake Angle GAMF	Fig	Parts: Flat Insert Screw		Parts: Wrench	Parts: Adapter Sleeve
									N·m	(For Torx hole)	
BNZ 606R	●	**7.0**	6.0	5.5	80	-14°	1	BFTX0204N	**0.5**	TRX06	HBB616
BNZ 608R	●	**9.0**	8.0	7.5	100	-12°	1				HBB816
BNZ 610R	●	**11.0**	10.0	9.5	125	-10°	1				
BNZ 612R	●	**13.0**	12.0	11.0	130	-8°	1				—
BNZ 616R	●	**17.0**	16.0	15.0	145	-6°	1				
BNZ 620R	●	**21.0**	20.0	19.0	160	-5°	1				

Insert (SUMIBORON)

Dimensions (mm)

Quantity	Cat. No.	BNC2010	BNC2020	BN1000	BN2000	BN7125 (New)	BN7000	Corner Radius RE
Single pack	**NU-ZNEX 040102**	—	—	●	●	○	●	0.2
	NU-ZNEX 040104	—	—	●	●	○	●	0.4
	NC-ZNEX 040102LE	●	—	—	—	—	—	0.2
	NC-ZNEX 040104LE	●	—	—	—	—	—	0.4
	NC-ZNEX 040102LT	—	●	—	—	—	—	0.2
	NC-ZNEX 040104LT	—	●	—	—	—	—	0.4
10 pack	**T-NU-ZNEX 040102**	—	—		●			0.2
	T-NU-ZNEX 040104	—	—		●			0.4

Fig 1

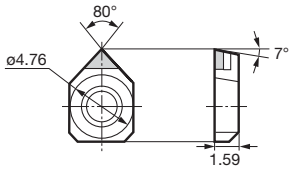
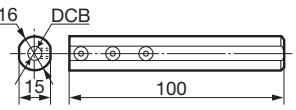


Fig 1



Sleeve

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Applicable Holder	Fig
HBB 616	●	6.0	BNZ 606R	1
HBB 816	●	8.0	BNZ 608R	1

HBX type sleeve (HBX6016) can also be used with BNZ606R.

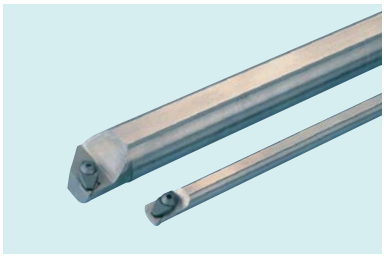
Recommended Cutting Conditions

Spindle Speed n	Above 2,000 min^{-1}	Low speeds may cause chattering and chipping on the cutting edge.
Depth of Cut ap	0.03 to 0.2mm	Excessive depth of cut may cause larger tool deformation, resulting in deterioration of bore accuracy.
Feed Rate f	0.03 to 0.1mm/rev	—

Important Notes

(1) Make the holder overhang as short as possible. (Maximum L/D = 5)
(2) Even minor workpiece runout may affect tool life.
(3) Select a boring bar with a diameter as close to the bore diameter as possible.
(4) Although it is difficult to increase the rotational speed in small-diameter boring applications, higher speeds are recommended whenever possible to extend tool life.

BNB series



- High rigidity full cemented carbide boring bar shank
  - Minimal deformation produces boring with excellent dimensional tolerance.
  - Minimal chatter produces superior surface finish.
- Full-top SUMIBORON insert enables 3 cutting edges
- Can be used with SUMIDIA inserts for non-ferrous metal machining
- Now with economical single-corner NF type SUMIDIA insert

Expansion | T 60° | 92° | CBN | PCD

SUMIBORON
Clamp-on

SumiSmall

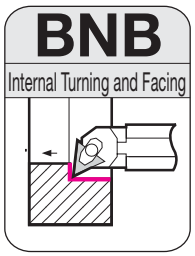


Fig 1

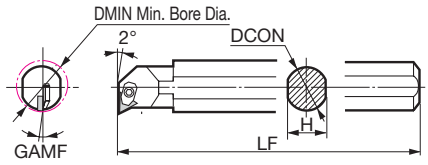


Figure shows right-handed (R) tool.

Holder

Dimensions (mm)

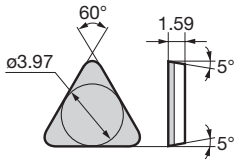
Cat. No.	Stock	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Rake Angle GAMF	Fig	Parts: Clamp Plate	Bolt	Nut	Wrench
											(For Hexagonal hole)
BNB 508R	●	**10.0**	8.0	7.0	140	-9°	1	BNBC	BH0306	BNBW-2	TH020
BNB 510R	●	**12.0**	10.0	9.0	140	-8°	1				
BNB 512R	●	**14.0**	12.0	11.0	160	-6°	1		FBUP3-A0-9	BNBW-4	
BNB 516R	●	**18.0**	16.0	14.0	180	-5°	1				
BNB 520R	●	**22.0**	20.0	18.0	180	-4°	1		BH0310	BNBW-7	

Insert (SUMIBORON, SUMIDIA)

Dimensions (mm)

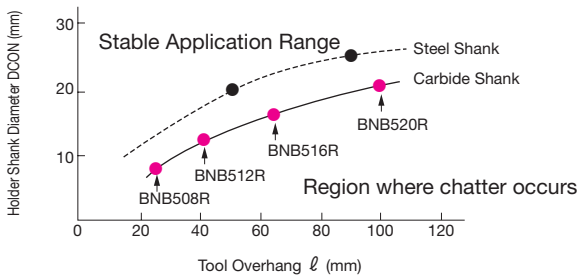
Cat. No.	SUMIBORON BNX10	BNX20	BN2000	BN350	BN500	BN7125 (New)	BN7000	SUMIDIA DA150	DA1000	Corner Radius RE
TBGN 060102B		●	●					●	●	0.2
TBGN 060104B	●	●	●	●	●	○	●	●	●	0.4
TBGN 060108B		●	●	●	●	○	●			0.8
TBGN 060102-BSTN*1	—	●	—	—	—	—	—	—	—	0.2
TBGN 060104-BSTN*1	—	●	—	—	—	—	—	—	—	0.4
TBGN 060108-BSTN*1	—	●	—	—	—	—	—	—	—	0.8
NF-TBGN 060102*2	—	—	—	—	—	—	—	—	●	0.2
NF-TBGN 060104*2	—	—	—	—	—	—	—	—	●	0.4

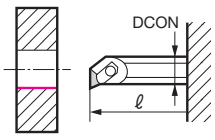
Fig 1



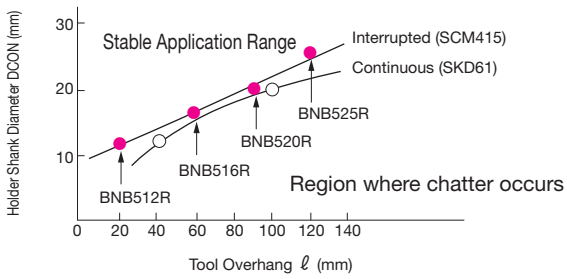
*1: TBGN ○○○○○○-BSTN is only available in BNX20 grade and has a smaller negative land angle. (BSTN: -15°, B: -25°. However, the negative land angle is uniquely configured for each grade.)
*2: NF-TBGN is a single corner insert. (This is not a Full-Top insert)

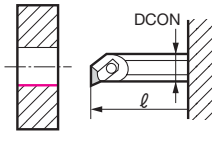
Cutting Performance





Work Material: SKD61 (60HRC)
Insert Cat. No.: TBGN060104B
Cutting Conditions: vc = 100m/min, f = 0.1mm/rev, ap = 0.2mm

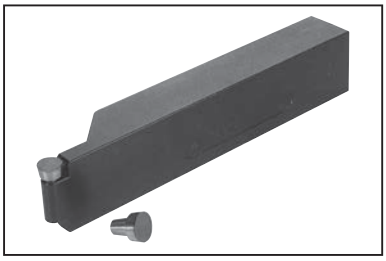




Work Material: SCM415 (61HRC) Internal Diameter ø45 (6U Groove)
Insert Cat. No.: TBGN060104B
Cutting Conditions: vc = 100m/min, f = 0.1mm/rev, ap = 0.2mm

○ mark: Stock or planned stock (please confirm stock availability)

TRGT series



● Clamping by cutting force alone

- Secure clamping is achieved by inserting the tapered portion of the insert into the holder.
- The lack of protrusions on the insert rake face allows smooth chip evacuation.

● Round insert enables various machining operations

Small round insert with stable clamping can be applied to various machining operations.

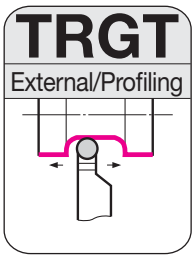


Fig 1

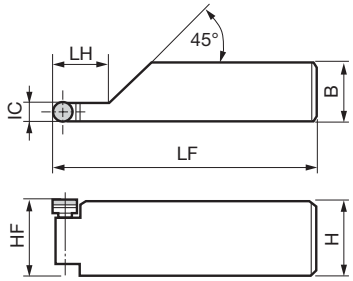


Figure shows right-handed (R) tool.

Holder

Dimensions (mm)

Cat. No.	Stock R	Stock L	Inscribed Circle IC	Height H	Width B	Overall Length LF	Cutting Edge Height HF	Head LH	Applicable Inserts	Fig
TRGT R/L2020K05	●		5	20	20	125	20	16	RTGN 0508M0	1
R/L2020K06	●		6	20	20	125	20	16	RTGN 0608M0	1
R/L2525M07			7	25	25	150	25	20	RTGN 0711M0	1
R/L2525M08	●		8	25	25	150	25	20	RTGN 0811M0	1
TRGT R/L3225P09	●		9	32	25	170	32	25	RTGN 0914M0	1
	●		10	32	25	170	32	25	RTGN 1014M0	1
TRGT R/L3225P12			12	32	25	170	32	25	RTGN 1214M0	1

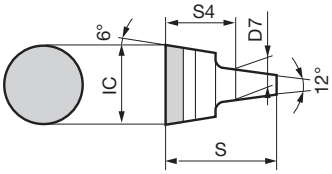
Inserts are not included with the tool holders.

Insert (SUMIBORON)

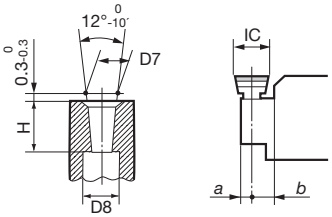
Dimensions (mm)

Cat. No.	BN2000	BNX20	BN7000	Inscribed Circle IC	Diameter D7	Thickness S	Thickness 2 S4	Fig
RTGN 0508M0		●		5	2.5	7.5	3.5	1
0608M0		●		6	3.5	7.5	3.5	1
RTGN 0711M0		●		7	3.5	11.0	5.0	1
0811M0		●		8	4.5	11.0	5.0	1
RTGN 0914M0		●		9	5.5	14.0	6.0	1
1014M0		●		10	5.5	14.0	6.0	1
1214M0		●		12	7.5	14.0	6.0	1

Fig 1

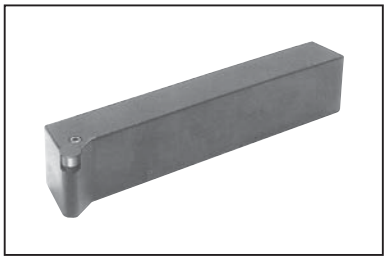


Insert Mounting Details



Supported Insert Diameter IC	H	D7	D8	*a*	*b*
5	4.0	2.5	1.9	1.85	3.2
6	4.0	3.5	2.9	2.35	3.7
7	6.0	3.5	2.5	2.75	4.3
8	6.0	4.5	3.5	3.25	4.8
9	7.5	5.5	4.2	4.15	5.9
10	7.5	5.5	4.2	4.15	5.9
12	7.5	7.5	6.2	5.15	6.9

PR series



- Lever lock clamping system
  - Easy operation; the lack of protrusions on the insert rake face allows smooth chip evacuation.
- Versatile round insert can be applied to various operations.

PRGC
External Profiling

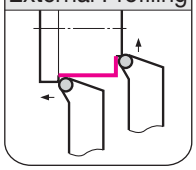
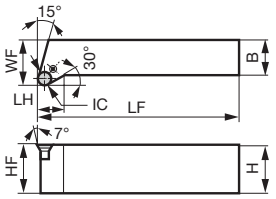


Fig 1



Holder

Dimensions (mm)

Cat. No.	Stock		Inscribed Circle	Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Inserts	Fig
	R	L	IC	H	B	LF	WF	HF	LH		
PRGC R/L3225P9	●	●	9	32	25	170	32	32	18	RCGA 0906M0	1

PRDC
General External Turning

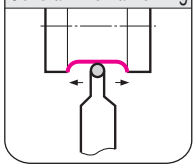
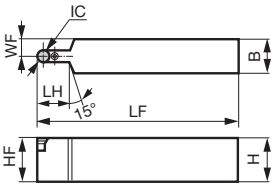


Fig 1



Holder

Dimensions (mm)

Cat. No.	Stock		Inscribed Circle	Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Inserts	Fig
	R	L	IC	H	B	LF	WF	HF	LH		
PRDC N 3225P9		●	9	32	25	170	12.5	32	25	RCGA 0906M0	1

PRGN
General External Turning

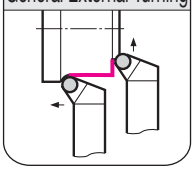
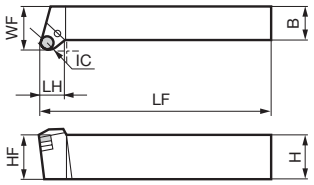


Fig 1



Holder

Dimensions (mm)

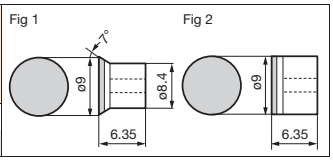
Cat. No.	Stock		Inscribed Circle	Height	Width	Overall Length	Cutting Edge	Cutting Edge Height	Head	Applicable Inserts	Fig
	R	L	IC	H	B	LF	WF	HF	LH		
PRGN R/L3225P9	●	●	9	32	25	170	32	32	10	RNGA 0906M0	1

Inserts are not included with the tool holders.

Insert (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000	BNX20	BN350	BN7000	Fig
RCGA 0906M0	●				1
RNGA 0906M0	●	●			2



Parts

Applicable Holders	Shim	Lever Pin	Bolt	Shim Retainer	Wrench
PRGC R/L3225P9 PRDCN 3225P9	LSR817	LCL3S	LCS3	LSP3	LH025
PRGN R/L3225P9	LSR917				

BNRN series

- **Insert can be reground and used again**
  - The same holder can be used for a reground insert by adjusting the slide locator with a clamp.
- **Reliable holder design**
  - The tip of the clamp plate is a cemented carbide chipbreaker that can withstand wear from chips.
  - Slide locator uses HSS for durability.

Expansion CBN

BNRN
External Roll Turning

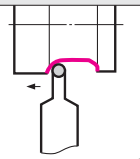
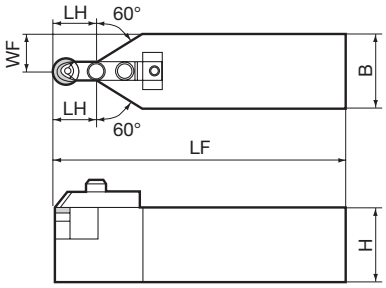


Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Cutting Edge WF	Head LH	Applicable Inserts New Cat. No.	Applicable Inserts (Regrindable range)	Fig
BNRN 3232-08-07		**32**	**32**	200	16	13	RBG08-B	8.0 to 7.0	1
BNRN 4038-10-09		**40**	**38**	250	19	17	RBG10-B	10.0 to 9.0	1
4038-12-11		**40**	**38**	250	19	20	RBG12-B	12.0 to 11.0	1
BNRN 5050-14-12		**50**	**50**	350	25	25	*	14.0 to 12.0	1
5050-16-14		**50**	**50**	350	25	25	RBG16-B	16.0 to 14.0	1
5050-18-16		**50**	**50**	350	25	30	*	18.0 to 16.0	1
5050-20-18		**50**	**50**	350	25	30	RBG20-B	20.0 to 18.0	1
5050-22-20		**50**	**50**	350	25	35	*	22.0 to 20.0	1
5050-24-22		**50**	**50**	350	25	35	*	24.0 to 22.0	1
5050-26-24		**50**	**50**	350	25	35	RBG26-B	26.0 to 24.0	1

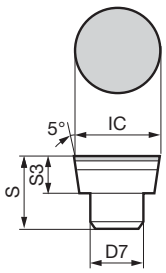
*Blank space indicates holders for reground inserts. Inserts are sold separately.

Insert (SUMIBORON)

Dimensions (mm)

Cat. No.	New BN7125	BN7000	Inscribed Circle IC	Diameter D7	Thickness 2 S3	Thickness S	Fig
RBG 08-B	○	●	8.0	4.0	4.0	6.5	1
10-B	○	●	10.0	5.0	5.0	9.0	1
12-B	○	●	12.0	6.0	6.0	11.0	1
16-B	○	●	16.0	8.0	8.0	13.0	1
20-B	○	●	20.0	10.0	10.0	15.0	1
26-B	○	●	26.0	14.0	10.0	15.0	1

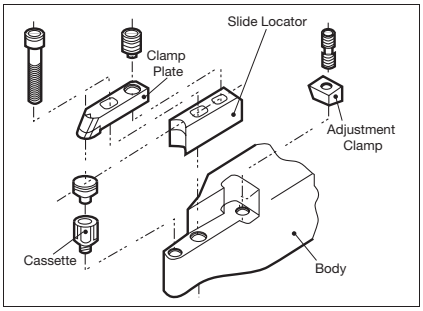
Fig 1



Parts

Applicable Holder	Slide Locator	Adjustment Clamp	Cassette	Clamp Plate	Cap Screw	Set Screw	Double Screw	Wrench
BNRN 3232-08-07	BNRS R-08	BNRC-08	BNRE-08	BNRW-08	BX0425	BTD0609	WB5-18	LH025
BNRN 4038-10-09	BNRS R-10		BNRE-10					LH030
BNRN 4038-12-11	BNRS R-12	BNRC-12	BNRE-12	BNRW-12	BX0635	BTD0812	WB6-20	LH030
BNRN 5050-14-12	BNRS R-14		BNRE-14		BX0640		WB6-30	LH040 LH050
BNRN 5050-16-14	BNRS R-16	BNRC-16	BNRE-16	BNRW-16	BX0640	BTD0812	WB8-30	LH040 LH050
BNRN 5050-18-16	BNRS R-18		BNRE-18				WB6-30	
BNRN 5050-20-18	BNRS R-20	BNRC-20	BNRE-20	BNRW-20			WB8-30	
BNRN 5050-22-20	BNRS R-22		BNRE-22				WB6-30	
BNRN 5050-24-22	BNRS R-24	BNRC-26	BNRE-24	BNRW-26	BX0840	BTD0818	WB6-30	LH040
BNRN 5050-26-24	BNRS R-26		BNRE-26				WB8-30	LH060

Structure



○ mark: Stock or planned stock (please confirm stock availability)

GWB series

■ Features

- Tangentially-mounted insert enhances tool rigidity.
- Double clamping holder design improves stability during continuous and interrupted grooving. Can also be used for traverse cutting.
- Long tool life for interrupted cutting applications with the new Coated SUMIBORON BNC30G grade for grooving (BN2000 recommended for continuous cutting).
- Suited for grooving various types of hardened steel. Variety of widths of cut available from 1.5 to 6.0mm.

External | CBN

Hardened Steel,
Shallow Grooves Double Clamp

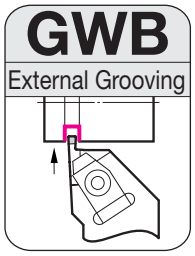


Fig 1

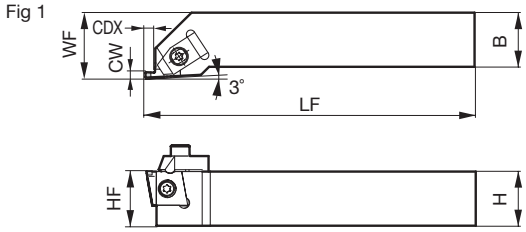


Figure shows right-handed (R) tool.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock R	Stock L	Height H	Width B	Overall Length LF	Cutting Edge Distance WF	Cutting Edge Height HF	Width of Cut CW	Maximum Groove Depth CDX	Group No.	Fig	Clamp Plate	Cap Screw	Cap Screw N·m	Flat Head Screw	Spring	Wrench
GWB R/L 2525-45	●	●	25	25	151 (150)	30	25	**1.5 ≤ CW ≤ 4.5**	**3.5 to 5.0**	1	1	TF72/TF73	BX0520T	**5.0**	BFTX0511N	GSP06	TRX20
GWB R/L 2525-60	●	●	25	25	151	30	25	**4.5 < CW ≤ 6.0**	**5.0**	2	1						

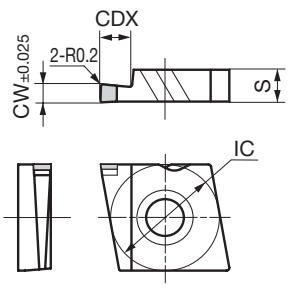
Dimensions in ( ) are for width of cut (CW) of 3.0 or less. Right-handed (R) tool holders are applicable with right-handed (R) inserts and clamp plates (TF72).

Insert (SUMIBORON)

Dimensions (mm)

Cat. No.	BN2000 R	BN2000 L	BNC30G R	BNC30G L	Width of Cut CW	Groove Depth CDX	Inscribed Circle IC	Thickness S	Group No.	Applicable Holder	Fig
CGA R/L 1504150	●	●	●	●	**1.5**	3.5	15.875	4.76			1
CGA R/L 1504200	●	●	●	●	**2.0**	3.5	15.875	4.76			1
CGA R/L 1504250	●	●	●	●	**2.5**	4.0	15.875	4.76			1
CGA R/L 1504300	●	●	●	●	**3.0**	4.0	15.875	4.76	1	GWB R/L 2525-45	1
CGA R/L 1504350	●	●	●	●	**3.5**	5.0	15.875	4.76			1
CGA R/L 1504400	●	●	●	●	**4.0**	5.0	15.875	4.76			1
CGA R/L 1504450	●	●	●	●	**4.5**	5.0	15.875	4.76			1
CGA R/L 1506500	●	●	●	●	**5.0**	5.0	15.875	6.35			1
CGA R/L 1506550	●	●	●	●	**5.5**	5.0	15.875	6.35	2	GWB R/L 2525-60	1
CGA R/L 1506600	●	●	●	●	**6.0**	5.0	15.875	6.35			1

Fig 1



* It is also possible to manufacture widths of cut other than those listed above (CW = 1.5 to 6.0mm).

Grade Features

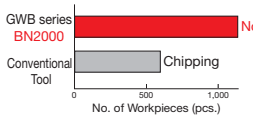
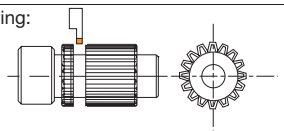
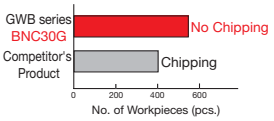
Grade	Application Range	Features	HV(GPa)	TRS(GPa)
BN2000	Continuous Grooving	General-purpose grade with superior wear resistance	31 to 34	1.0 to 1.1
BNC30G	Interrupted Grooving	Grade suited to interrupted grooving. Features tough substrate with special ceramic coating that exhibits both peel-off and wear resistance.	33 to 35	1.1 to 1.2

Recommended Cutting Conditions

Cutting Conditions	H Hardened Steel
Cutting Speed vc (m/min)	80 to 120
Feed Rate f (mm/rev)	0.04 to 0.08

* In order to avoid thermal cracking of the SUMIBORON cutting edge during interrupted cutting, ensure that the work material is thoroughly dry before cutting.

Application Examples

Tooling	Work Material	Tool Cat. No.	Cutting Conditions	Tool Life Comparison
Shaft Grooving: Continuous Required Surface Roughness for Groove Sides: Ra 0.4μm	Carburised steel 58 to 62 HRC	CGAR1504200 BN2000	vc : 120m/min f : 0.05mm/rev Groove Depth: 2mm Dry	
Spline Grooving: Interrupted 	Carburised steel 58 to 62 HRC	CGAR1504200 BNC30G	vc : 100m/min f : 0.05mm/rev Groove Depth: 1.6mm Dry	

N·m Recommended Tightening Torque (N·m)

BNGG series

■ Features

- Improved rigidity for longer tool life
  Strong clamping reduces insert fracture and holder chatter
- Enhanced tooling for 2mm fine grooves or threading
  Grooving and threading can be done by changing the support

External CBN

Clamp-on
for Hardened Steel Shallow Grooves

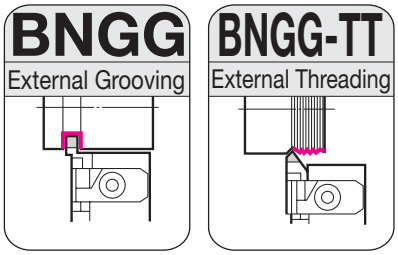


Fig 1 (Grooving)

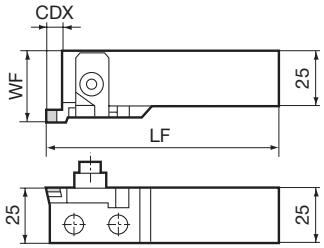
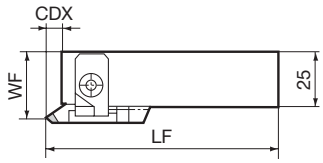


Fig 2 (Threading)



Holder

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Cutting Edge Distance WF	Groove Depth CDX	Overall Length LF	Applicable Insert	Fig
Grooving	**BNGG R/L2525-200**	●		30.5	4	150	BNGNT0200 R/L	1
	BNGG R/L2525-250	●		30.5	4	150	BNGNT0250 R/L	1
	BNGG R/L2525-300	●		30.5	5	150	BNGNT0300 R/L	1
	BNGG R/L2525-400	●		30.5	6	151	BNGNT0400 R/L	1
	BNGG R/L2525-500	●		30.5	6	151	BNGNT0500 R/L	1
	BNGG R/L2525-600	●		30.5	7	152	BNGNT0600 R/L	1
Threading	**BNGG R/L2525-TT**	●		28.5	5	150	BNTT1020 R/L, BNTT1530 R/L	2

Inserts are not included with the tool holders.
* Holder body is universal. The holder can be configured for different groove widths or threading by changing the support.

Insert (SUMIBORON)

Dimensions (mm)

	Cat. No.	BN250 R	BN250 L	BNX20 R	BNX20 L	BN350 R	BN350 L	BNX25 R	BNX25 L	Width of Cut CW	Groove Depth CDX	Corner Radius RE	Overall Length L	Cutting Edge Distance WF3	Applicable Holder	Fig
Grooving	**BNGNT0200 R/L**	●				●				**2.0**	4.0	0.2	25	6.0	BNGG R/L 2525-200	1
	BNGNT0250 R/L	●				●				**2.5**	4.0	0.2	25	6.0	BNGG R/L 2525-250	1
	BNGNT0300 R/L	●				●				**3.0**	5.0	0.4	25	6.0	BNGG R/L 2525-300	1
	BNGNT0400 R/L	●				●				**4.0**	6.0	0.4	26	6.0	BNGG R/L 2525-400	1
	BNGNT0500 R/L	●				●				**5.0**	6.0	0.4	26	6.0	BNGG R/L 2525-500	1
	BNGNT0600 R/L	●				●				**6.0**	7.0	0.4	27	6.0	BNGG R/L 2525-600	1
Threading	**BNTT1020 R/L**	●								Pitch 1.0 to 2.0	0.14	25	4.0	BNGG R/L 2525-TT	2	
	BNTT1530 R/L	●								Pitch 1.5 to 3.0	0.2	25	4.0			2

Fig 1 (Grooving)

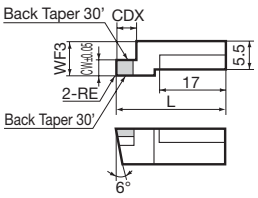
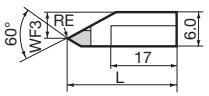


Fig 2 (Threading)



Parts

Applicable Holder	Support	Clamp Plate	Adjustment Screw	Spring	Cap Screw	Wrench	
BNGG R/L2525-200	BNGS R/L 200	BNGC R/L	FMJ	GSP06	BX0615 (For Clamp Plate) BX0414 (For Support)	LH050 (For Clamp Plate) LH030 (For Support)	1.8×45
BNGG R/L2525-250	BNGS R/L 250						
BNGG R/L2525-300	BNGS R/L 300						
BNGG R/L2525-400	BNGS R/L 400						
BNGG R/L2525-500	BNGS R/L 500						
BNGG R/L2525-600	BNGS R/L 600						
BNGG R/L2525-TT	BNGS R/L TT						

Recommended Cutting Conditions

• Grooving

Cutting Conditions	H Hardened Steel
Cutting Speed vc (m/min)	80 to 120
Feed Rate f (mm/rev)	0.03 to 0.07

• Threading

Cutting Conditions	H Hardened Steel
Cutting Speed vc (m/min)	80 to 120
Feed Rate f (mm)	Maximum Pitch 3.0

FMU series/FMU-E series

High-speed Finishing for Cast Iron

- High speed finishing cutter for gray cast iron milling that uses removable cartridges for easy insert runout precision management
- Utilises SUMIBORON grade insert for cast iron machining with excellent wear and fracture resistance
- Available in shell type and small diameter type with shank

■ Features

- High-speed machining at vc = up to 2,000m/min
- Surpasses Rz 3.2 surface finish
- Safety structure for centrifugal force under high-speed cutting conditions
- Runout is less than 10μm: just attach the cartridge
- Easy runout adjustment using external setting
- Running cost is reduced because of the economical insert

■ Application Range

FC250 to FC300 (200 to 250HB) with pearlite matrix and gray cast iron (130 to 160HB) with ferrite matrix
[Example] Engine blocks, cylinder heads, etc.

■ Specifications

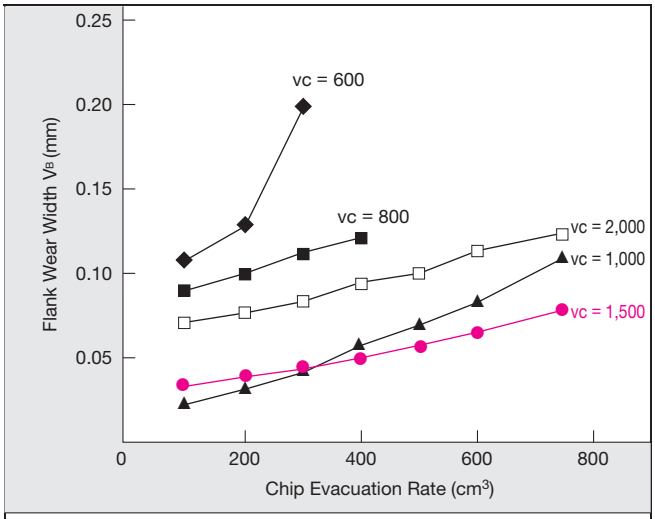
• Shell	ø80 to ø315mm (FMU series)
Shank type	ø40 to ø63mm (FMU-E series)
• Regular Blade	SNEW1203ADTR/L
• Low Thrust Blade	SNEW1203ADTR/L-S

■ Recommended Cutting Conditions

• Cutting Speed	vc = 800 to 2,000m/min
• Feed Rate	fz = 0.1 to 0.3mm/t
• Depth of Cut	ap = 0.5mm or less
• Coolant	Dry

■ Cutting Performance

• Wear Diagram



Work Material: FC250 240HB (Pearlite)
Cutting Speed: vc = 600 to 2,000m/min Feed Rate: fz = 0.15mm/t
Depth of Cut: ap = 0.5mm Dry

FMU series/FMU-E series

Expansion

Rake Angle	Radial	2°
	Axial	8°

0.5mm 45°

Face Milling

Fig 1

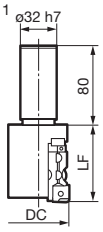


Fig 2

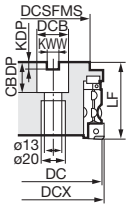


Fig 3

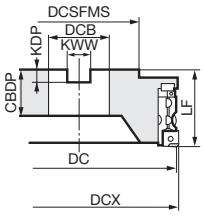


Fig 4

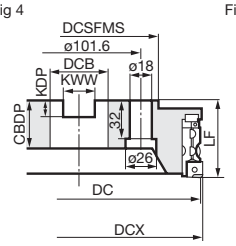
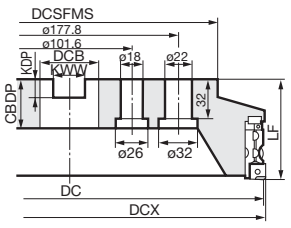


Fig 5



Body

Dimensions (mm)

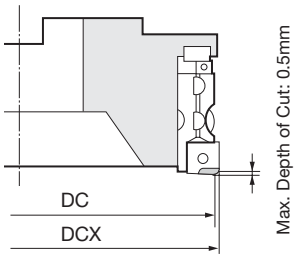
	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**FMU 4040ER**	●	37.2	**40**	—	63	—	—	—	—	2	1.0	1
	4050ER	●	47.2	**50**	—	63	—	—	—	—	3	1.2	1
	4063ER	●	60.2	**63**	60	63	**25.4**	9.5	6	25	4	1.0	2
	FMU 4080R	●	**80**	82.8	60	63	**25.4**	9.5	6	25	6	1.7	2
	4100R	●	**100**	102.8	76	63	**31.75**	12.7	8	38	8	2.5	3
	4125R	●	**125**	127.8	75	63	**38.1**	15.9	10	38	10	3.9	3
	4160R	●	**160**	162.8	100	63	**50.8**	19.1	11	38	12	6.3	3
	4200R	●	**200**	202.8	130	63	**47.625**	25.4	14	40	16	9.3	4
	4250R		**250**	252.8	130	63	**47.625**	25.4	14	40	20	14.5	4
	4315R		**315**	317.8	240	80	**47.625**	25.4	14	40	24	25.0	5

Inserts are sold separately.

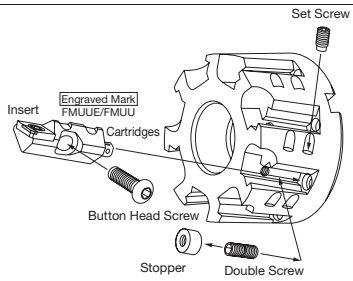
Note: The values in red have been changed from the 2021-2022 General Catalogue.

Max. Depth of Cut

Approach Angle : 0°
Axial Rake Angle : +8°
Radial Rake Angle : +2°



Structure



Insert

Dimensions (mm)

Grade Classification		SUMIBORON			
Process	High-speed/Light Cutting	K	K	K	
	General-purpose	K	K	K	
	Roughing				
Cat. No.		New BN7125	BN7000	BN700	Fig
SNEW1203ADTR		○	●	▲	1
1203ADTR-S		○	●	▲	2

-S denotes a low-thrust insert.

Fig 1

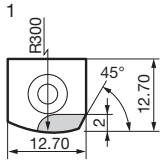
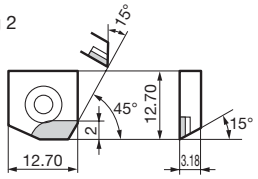


Fig 2



Cartridges

Cartridges	Flat Insert Screw		Adjustment Bolt	O-ring	Wrench	Wrench
		N·m			(For Flat Insert Screw)	
FMUU(E)*	BFTX0509N	**5.0**	FMUJ	P3	TTX20	TH015

* FMU4040ER/4050ER/4063ER use FMUUE type cartridges.

* FMUU/FMUUE are pre-assembled with flat screws and adjustment screws (with O-rings attached).

Setting Gauge

FMU-SET (Sold Separately)

*Dial gauge is not included.

Parts

Bolt	Set Screw	Stopper	Double Screw	Wrench	Wrench	Wrench (Radial)	Anti-seizure Cream
				(For Cartridges)	(For Set Screws)	(For Stoppers)	
BH0620*	BTD0609	FMUE	WB5-10	TH040	LH030	LH025	SUMI-P

*FMU4040ER, 4050ER and 4063ER use BH0615 bolts.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Gray Cast Iron	250HB	800- **1,400** -2,000	0.10- **0.20** -0.30	BN7125(Dry)

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m) ○ mark: Stock or planned stock (please confirm stock availability) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

FM series/FMF series

Cast Iron

Expansion

Rake	Radial	2°
Angle	Axial	8°

0.5mm 45°

Face Milling

Fig 1

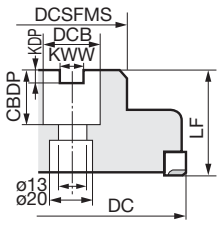


Fig 2

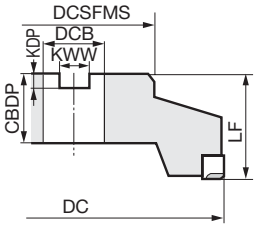


Fig 3

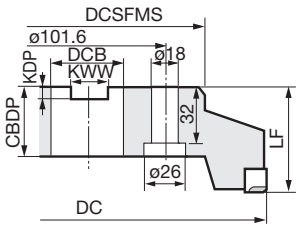
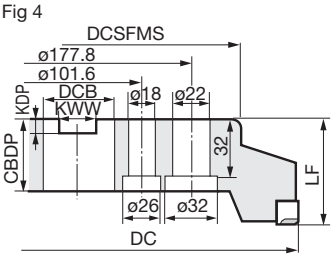


Fig 4



High-speed Finishing for Cast Iron

- Specially designed cutting edge shape combined with SUMIBORON grade for cast iron machining, realising high-speed milling of gray cast iron.

Body

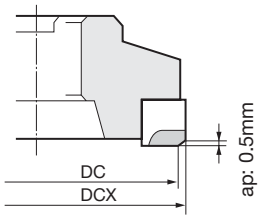
Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**FM 5080 R/L**	●		**80**	82.8	60	50	**25.4**	9.5	6	25	6	1.6	1
	5100 R/L	●		**100**	102.8	75	50	**31.75**	12.7	8	32	8	2.4	2
	5125 R/L	●		**125**	127.8	75	63	**38.1**	15.9	10	38	10	3.4	2
	5160 R/L	●		**160**	162.8	100	63	**50.8**	19.1	11	38	12	5.6	2
	5200 R/L			**200**	202.8	130	63	**47.625**	25.4	14	40	16	8.3	3
	5250 R/L			**250**	252.8	130	63	**47.625**	25.4	14	40	20	14.3	3
	5315 R/L			**315**	317.8	240	80	**47.625**	25.4	14	40	24	27.8	4
	FMF 5125 R/L			**125**	127.8	75	63	**38.1**	15.9	10	38	12	3.4	2
	5160 R/L			**160**	162.8	100	63	**50.8**	19.1	11	38	16	5.6	2
	5200 R/L			**200**	202.8	130	63	**47.625**	25.4	14	40	20	8.3	3
	5250 R/L			**250**	252.8	130	63	**47.625**	25.4	14	40	24	14.3	3
	5315 R/L			**315**	317.8	240	80	**47.625**	25.4	14	40	28	27.8	4

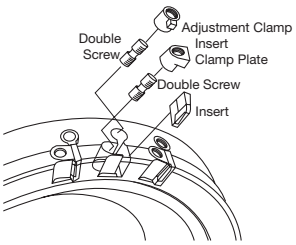
Inserts are sold separately.

Body

Approach Angle : 0°
Axial Rake Angle : +8°
Radial Rake Angle : +2°



Structure



Insert

Dimensions (mm)

Grade Classification		SUMIBORON						
Process	High-speed/Light Cutting	K		K		K		
	General-purpose	K		K		K		
	Roughing							
Cat. No.		New BN7125 R	BN7125 L	BN7000 R	BN7000 L	BN700 R	BN700 L	Fig
SNEN 1504ADT R/L		○		●		▲		1
1504ADT R/L-S		○		●		▲		2

Fig 1

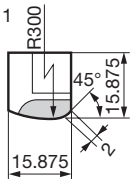
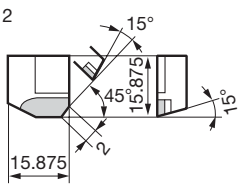


Fig 2



Parts

Applicable Cutter	Insert Clamp Plate	Adjustment Clamp	Adjustment Screw	Double Screw	Wrench	Wrench
FM5080R/L	FMW	—	FMJ	WB7F-20TL	TT25	1.8 x 45
FM5100R/L FM5315R/L		FME	—			—

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability) ○ mark: Stock or planned stock (please confirm stock availability)

RM series

Rake Angle	Radial	-6° 45'
	Axial	-5° 45'

3mm / 75°

Face Milling

Fig 1

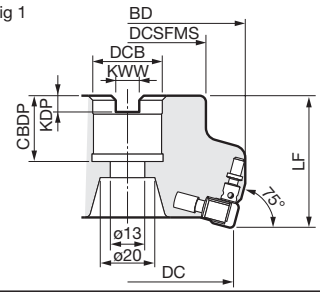
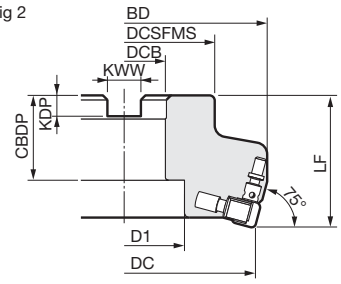


Fig 2



For High-speed, High-efficiency Milling of Cast Iron

- **High-efficiency Milling of Gray Cast Iron**
  - · Utilises Solid SUMIBORON for high-speed cutting of vc = 1,500m/min
  - · High speed roughing with depth of cut up to 3.0mm
  - · Wiper insert for high-speed finishing
- **Low Cost**
  - · Economical double-sided insert with 8 usable corners
  - · Insert can be reground and used again
- **Simple Runout Adjustment Mechanism**
  - · Simple design for direct insert mounting
  - · Easy yet precise runout precision adjustment

Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	External Dia. BD	Boss DCSFMS	Height LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Number of Teeth	Maximum Spindle Speed (min⁻¹)	Weight (kg)	Fig
Inch	**RM 3080R**		**80**	90	60	50	**25.4**	9.5	6	25	—	6	9,000	1.6	1
	RM 3100R		**100**	110	70	50	**31.75**	12.7	8	32	46	8	8,000	2.1	2
	3125R		**125**	135	80	63	**38.1**	15.9	10	38	59	10	7,000	3.9	2
	3160R		**160**	170	100	63	**50.8**	19.1	11	38	80	12	6,000	5.9	2

Inserts are sold separately.

Insert

Dimensions (mm)

Grade Classification		SUMIBORON		
Process	High-speed/Light Cutting	K	K	
	General-purpose	K	K	
	Roughing	K	K	
Cat. No.		BNS8125	BNC8115	Fig
SNGN 090308		●	●	1
090312		●	●	1
SNEN 090308W		●	●	2

Fig 1

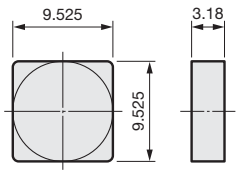
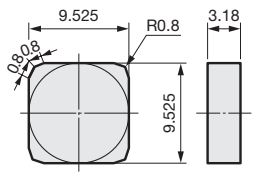
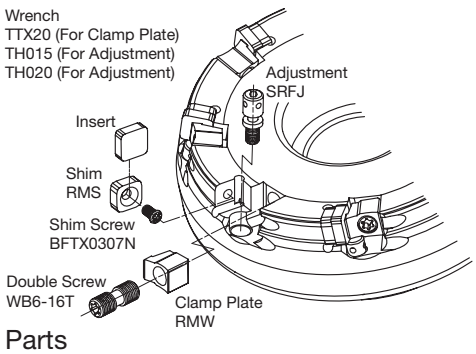


Fig 2 Wiper Insert





Parts

Shim	Shim Screw		Clamp Plate	Double Screw	Adjustment	Wrench (For Clamp Plate)	Wrench (For Adjustment)	Wrench (For Adjustment)
		N·m						
RMS	BFTX0307N	**2.0**	RMW	WB6-16T	SRFJ	TTX20	TH015	TH020

Precautions for Use

- · Do not use inserts with different catalogue numbers, such as a mix of standard and wiper inserts, on a single cutter setting.
- · New and reground inserts cannot be mixed for use. Use either only new inserts or only reground inserts.
- · Inserts can only be reground once (inscribed circle dimension must be at least 9.125mm).

For hardened steel machining, use the SEC-ACE MILL DNF type.
Body: H47 Insert: L118

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grades
K	Gray Cast Iron	250HB	800- **1,150** -1,500	0.05- **0.13** -0.20	BNS8125 (Dry)

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

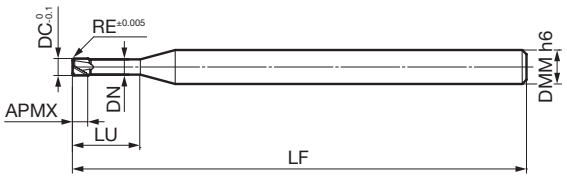
N·m Recommended Tightening Torque (N·m)

BNBR type

Pre-hardened Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Hardened Steel 60 to 65HRC

2 Flutes | CBN | Radius r | Shoulder Milling | Face Milling | Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Corner Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Wiper Edge	Fig
BNBR 2D020R005-0054	●	**0.2**	0.05	0.1	0.5	50	0.17	4	No	1
2D030R005-0054	●	**0.3**	0.05	0.15	0.5	50	0.27	4	No	1
2D040R005-0054	●	**0.4**	0.05	0.2	0.5	50	0.37	4	No	1
2D050R005-0054	●	**0.5**	0.05	0.3	0.5	50	0.47	4	No	1
2D050R005-0154	●	**0.5**	0.05	0.3	1.5	50	0.47	4	No	1
BNBR 2D050R005-0254	●	**0.5**	0.05	0.3	2.5	50	0.47	4	No	1
2D050R010-0154	●	**0.5**	0.10	0.3	1.5	50	0.47	4	No	1
2D050R010-0254	●	**0.5**	0.10	0.3	2.5	50	0.47	4	No	1
2D100R005-0304	●	**1.0**	0.05	0.7	3.0	50	0.97	4	Yes	1
2D100R005-0504	●	**1.0**	0.05	0.7	5.0	50	0.97	4	Yes	1
BNBR 2D100R010-0304	●	**1.0**	0.10	0.7	3.0	50	0.97	4	Yes	1
2D100R010-0504	●	**1.0**	0.10	0.7	5.0	50	0.97	4	Yes	1
2D100R020-0304	●	**1.0**	0.20	0.7	3.0	50	0.97	4	Yes	1
2D100R020-0504	●	**1.0**	0.20	0.7	5.0	50	0.97	4	Yes	1
2D100R030-0304	●	**1.0**	0.30	0.7	3.0	50	0.97	4	Yes	1
BNBR 2D100R030-0504	●	**1.0**	0.30	0.7	5.0	50	0.97	4	Yes	1
2D150R010-0454	●	**1.5**	0.10	1.2	4.5	50	1.47	4	Yes	1
2D150R010-0754	●	**1.5**	0.10	1.2	7.5	50	1.47	4	Yes	1
2D150R020-0454	●	**1.5**	0.20	1.2	4.5	50	1.47	4	Yes	1
2D150R020-0754	●	**1.5**	0.20	1.2	7.5	50	1.47	4	Yes	1
BNBR 2D150R030-0454	●	**1.5**	0.30	1.2	4.5	50	1.47	4	Yes	1
2D150R030-0754	●	**1.5**	0.30	1.2	7.5	50	1.47	4	Yes	1
2D200R010-0604	●	**2.0**	0.10	1.5	6.0	50	1.97	4	Yes	1
2D200R020-0604	●	**2.0**	0.20	1.5	6.0	50	1.97	4	Yes	1
2D200R030-0604	●	**2.0**	0.30	1.5	6.0	50	1.97	4	Yes	1
BNBR 2D200R050-0604	●	**2.0**	0.50	1.5	6.0	50	1.97	4	Yes	1

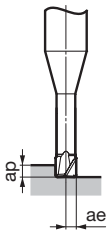
Grade: BNX20

Identification Code

BNBR 2 D050 R010 - 015 4

Series Code	Number of Flutes	Dia.	Corner Radius	Neck Length	Shank Dia.

BNBR type



Recommended Cutting Conditions

1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
   Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.

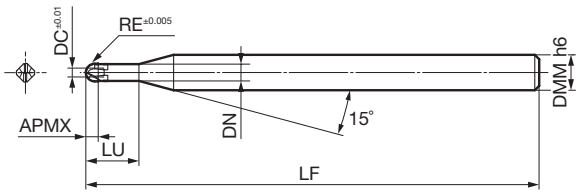
Work Material			STAVAX, NAK80, SKD61 (Up to 52HRC)				ELMAX, DC53, SKD11 Modified (Up to 62HRC)				YXR3, SKH (Up to 70HRC)			
DC (mm)	RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	ae (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	ae (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	ae (mm)
0.2	0.05	0.5	40,000	400	0.005	0.03	40,000	400	0.005	0.03	40,000	250	0.005	0.02
0.3	0.05	0.5	40,000	500	0.010	0.05	40,000	500	0.010	0.05	40,000	300	0.005	0.03
0.4	0.05	0.5	40,000	600	0.015	0.1	40,000	600	0.015	0.1	40,000	400	0.01	0.05
0.5	0.05	0.5	40,000	600	0.02	0.15	40,000	600	0.02	0.15	40,000	400	0.01	0.1
	0.05	1.5	40,000		0.02	0.1	40,000		0.02	0.1	35,000			0.05
	0.1		40,000				40,000				35,000			
	0.05	2.5	40,000		0.01	0.05	40,000		0.01	0.05	35,000			
	0.1		40,000				40,000				35,000			
1.0	0.05	3.0	35,000	800	0.03	0.3	35,000	800	0.03	0.2	30,000	600	0.01	0.1
	0.1		35,000				35,000				30,000			
	0.2		35,000				35,000				30,000			
	0.3		35,000				35,000				30,000			
	0.05	5.0	35,000		0.02	0.2	35,000	800	0.02	0.1	30,000	600	0.01	0.1
	0.1		35,000				35,000				30,000			
	0.2		35,000				35,000				30,000			
	0.3		35,000				35,000				30,000			
1.5	0.1	4.5	26,000	800	0.03	0.5	26,000	800	0.03	0.3	20,000	600	0.02	0.3
	0.2		26,000				26,000				20,000			
	0.3		26,000				26,000				20,000			
	0.1	7.5	26,000		0.03	0.5	26,000	800	0.03	0.3	20,000	600	0.02	0.3
	0.2		26,000				26,000				20,000			
	0.3		26,000				26,000				20,000			
2.0	0.1	6.0	20,000	800	0.03	0.7	20,000	800	0.03	0.7	15,000	600	0.03	0.7
	0.2		20,000				20,000				15,000			
	0.3		20,000				20,000				15,000			
	0.5		20,000				20,000				15,000			

BNBP type

Pre-hardened Steel | Hardened Steel 45 to 55HRC | Hardened Steel 55 to 60HRC | Hardened Steel 60 to 65HRC

2 Flutes | CBN | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Fig
BNBP 2R020-0124	●	**0.20**	**0.4**	0.3	1.2	50	0.37	4	1
2R020-0126	●	**0.20**	**0.4**	0.3	1.2	50	0.37	6	1
2R020-0204	●	**0.20**	**0.4**	0.3	2.0	50	0.37	4	1
2R020-0304	●	**0.20**	**0.4**	0.3	3.0	50	0.37	4	1
2R020-0404	●	**0.20**	**0.4**	0.3	4.0	50	0.37	4	1
BNBP 2R030-0154	●	**0.30**	**0.6**	0.4	1.5	50	0.57	4	1
2R030-0156	●	**0.30**	**0.6**	0.4	1.5	50	0.57	6	1
2R030-0204	●	**0.30**	**0.6**	0.4	1.5	50	0.57	4	1
2R030-0304	●	**0.30**	**0.6**	0.4	3.0	50	0.57	4	1
2R030-0404	●	**0.30**	**0.6**	0.4	4.0	50	0.57	4	1
BNBP 2R030-0504	●	**0.30**	**0.6**	0.4	5.0	50	0.57	4	1
2R030-0604	●	**0.30**	**0.6**	0.4	6.0	50	0.57	4	1
2R050-0254	●	**0.50**	**1.0**	0.6	2.5	50	0.97	4	1
2R050-0256	●	**0.50**	**1.0**	0.6	2.5	50	0.97	6	1
2R050-0304	●	**0.50**	**1.0**	0.6	3.0	50	0.97	4	1
BNBP 2R050-0404	●	**0.50**	**1.0**	0.6	4.0	50	0.97	4	1
2R050-0604	●	**0.50**	**1.0**	0.6	6.0	50	0.97	4	1
2R050-0804	●	**0.50**	**1.0**	0.6	8.0	50	0.97	4	1
2R075-0404	●	**0.75**	**1.5**	0.9	4.0	50	1.47	4	1
2R075-0406	●	**0.75**	**1.5**	0.9	4.0	50	1.47	6	1
BNBP 2R100-0554	●	**1.00**	**2.0**	1.4	5.5	50	1.97	4	1
2R100-0556	●	**1.00**	**2.0**	1.4	5.5	50	1.97	6	1
2R100-0804	●	**1.00**	**2.0**	1.4	8.0	50	1.97	4	1

Grade: BN350

Identification Code

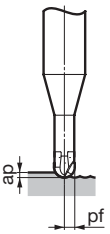
BNBP 2 R030 - 015 4

Series Code	Number of Flutes	Ballnose Radius	Neck Length	Shank Dia.

BNBP type

Recommended Cutting Conditions

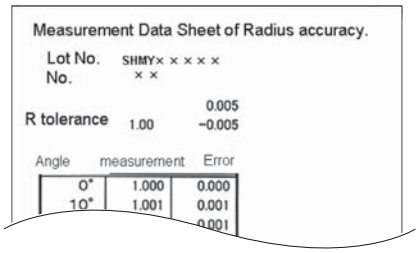
1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
   Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.



Work Material		STAVAX, NAK80, SKD61 (Up to 52HRC)				ELMAX, DC53, SKD11 Modified (Up to 62HRC)				YXR3, SKH (Up to 70HRC)			
RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)
0.2	1.2	40,000	1,000	0.005	0.010	40,000	800	0.005	0.010	40,000	600	0.005	0.005
	2.0	40,000	800	0.005	0.010	40,000	600	0.005	0.010	40,000	400	0.005	0.005
	3.0	40,000	600	0.005	0.010	40,000	500	0.005	0.010	40,000	300	0.005	0.005
	4.0	40,000	500	0.005	0.010	40,000	400	0.005	0.005	40,000	200	0.005	0.005
0.3	1.5	40,000	1,600	0.020	0.020	40,000	1,400	0.010	0.020	40,000	1,200	0.010	0.020
	2.0	40,000	1,500	0.010	0.020	40,000	1,300	0.010	0.020	40,000	1,100	0.010	0.010
	3.0	40,000	1,400	0.010	0.020	40,000	1,200	0.010	0.020	40,000	1,000	0.010	0.010
	4.0	30,000	1,200	0.010	0.010	30,000	1,000	0.010	0.010	30,000	700	0.005	0.010
	5.0	30,000	800	0.010	0.010	30,000	700	0.005	0.010	30,000	600	0.005	0.005
	6.0	30,000	600	0.005	0.010	30,000	500	0.005	0.005	30,000	400	0.005	0.005
0.5	2.5	40,000	2,800	0.040	0.050	40,000	2,800	0.030	0.040	40,000	2,200	0.020	0.030
	3.0	40,000	2,600	0.040	0.050	40,000	2,600	0.030	0.040	40,000	2,100	0.020	0.030
	4.0	40,000	2,400	0.030	0.050	40,000	2,400	0.020	0.030	40,000	2,000	0.020	0.020
	6.0	25,000	1,500	0.020	0.030	25,000	1,500	0.010	0.020	25,000	1,300	0.010	0.010
	8.0	16,000	1,200	0.020	0.020	16,000	1,100	0.010	0.020	16,000	850	0.010	0.010
0.75	4.0	32,000	2,400	0.030	0.030	32,000	2,200	0.020	0.030	32,000	2,000	0.020	0.020
1.0	5.5	40,000	4,000	0.050	0.050	40,000	4,000	0.030	0.030	40,000	3,000	0.020	0.030
	8.0	32,000	3,000	0.030	0.050	32,000	2,600	0.020	0.030	32,000	2,200	0.010	0.020

■ Radius Accuracy Inspection Test Results

Radius accuracy inspection report is attached as below with the ballnose type.


Measurement Data Sheet of Radius accuracy.

Lot No. SHMY× × × × ×
No. × ×

R tolerance 1.00 0.005 −0.005

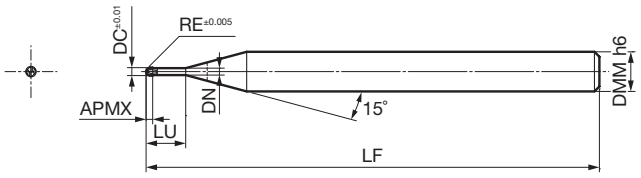
Angle	measurement	Error
0°	1.000	0.000
10°	1.001	0.001

BNBC type

Copper Alloy

2 Flutes | CBN | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Fig
BNBC 2R010-0034	●	**0.1**	**0.2**	0.2	0.3	50	0.17	4	1
2R010-0104	●	**0.1**	**0.2**	0.2	1.0	50	0.17	4	1
2R020-0054	●	**0.2**	**0.4**	0.3	0.5	50	0.37	4	1
2R020-0204	●	**0.2**	**0.4**	0.3	2.0	50	0.37	4	1
2R030-0104	●	**0.3**	**0.6**	0.4	1.0	50	0.57	4	1
BNBC 2R030-0304	●	**0.3**	**0.6**	0.4	3.0	50	0.57	4	1
2R050-0304	●	**0.5**	**1.0**	0.6	3.0	50	0.97	4	1

Grade: BN700

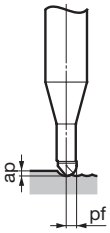
Identification Code

BNBC 2 R030 - 010 4

Series Code | Number of Flutes | Ballnose Radius | Neck Length | Shank Dia.

Recommended Cutting Conditions

1. Use a machine with high rigidity for stable cutting.
2. Non-water soluble cutting oil is recommended. Supply as a mist or external coolant.
   Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine rigidity and other conditions may vary.
5. Depths of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface roughness.



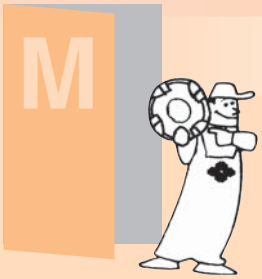
Side Milling

Work Material / Cutting Conditions / Cat. No.	Copper Alloy			
	Spindle Speed (min^{-1})	Feed Rate (mm/min)	Standard depth of cut (mm) ap	pf
BNBC 2R010-0034	20,000 -50,000	350	0.01	0.02
2R010-0104		350	0.007	0.015
BNBC 2R020-0054	20,000 -50,000	800	0.025	0.05
2R020-0204		700	0.02	0.03
BNBC 2R030-0104	20,000 -50,000	1,400	0.05	0.15
2R030-0304		1,200	0.04	0.1
BNBC 2R050-0304	20,000 -50,000	2,200	0.15	0.35

SUMIDIA/SUMIDIA BINDERLESS SUMICRYSTAL

M1 to M71

M



Grades	SUMIDIA series	M2
	SUMIDIA BINDERLESS NPD10/SUMIDIA DA90	M4
	SUMIDIA DA1000	M6
Inserts	SUMIDIA BREAK MASTER LD type/GD type	M7
	SUMIDIA BREAK MASTER DM type	M8
	SUMIDIA Insert Identification Code	M9
	Stock Table for SUMIDIA Indexable Inserts	M10
	Stock Table for SUMIDIA/SUMIDIA BINDERLESS Indexable Inserts	M28
Holders	SEC-Wide-Cut Holders SGW series	M29
	SUMIDIA Very Small Diameter Boring Bars CKB series	M30
	SUMIDIA Small Diameter Boring Bars DABB series	M31
Cutters/ Endmills	Expansion High-efficiency Cutter for Aluminum Alloys ALNEX ANX series	M32
	High-efficiency Cutter for Aluminum Alloys HF series	M44
	High-Speed Cutter for Aluminum Alloys RF series	M50
	High-efficiency Cutter for Aluminum Alloys SRF series	M52
	SUMIDIA Cutter FAM series/SAM series	M54
	SUMIDIA Cutter SAM-E type	M55
	SUMIDIA Mini-Cutter DFE series	M56
	SUMIDIA BINDERLESS Endmills NPDRS type/NPDBS type/NPDB type	M57
	SUMIDIA Endmill DFE series	M61
	SUMIDIA Endmill DAE series	M62
Drills	SUMIDIA Drill DAL series	M63
	SUMIDIA Drill DDL series	M63

M SUMICRYSTAL

SUMICRYSTAL M66
SUMICRYSTAL PD/PDX M67
SUMICRYSTAL UP M68
SUMICRYSTAL UP (Half Cut) M69
SUMICRYSTAL UPT M70
SUMICRYSTAL CD M71

Stock Markings and Symbols

- ● ● mark: Standard stocked item
- ● mark: To be replaced with the new item featured on the same page
- ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability).
- * mark: Semi-standard stock (please confirm stock availability)
- ○ mark: Stock or planned stock (please confirm stock availability)
- Blank: Made-to-order item
- — mark: Not available

SUMIDIA series

■ General Features

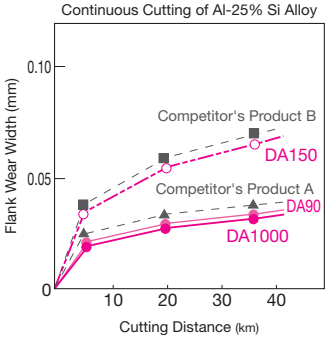
Our SUMIDIA sintered diamond series has 4 grades (DA90, DA150, DA2200, DA1000) with individual features depending on the optimum combination of diamond particle size and binder, as well as the NPD10 grade (nano-polycrystalline diamond) where nano-order diamond particles are directly bound with high strength without using binders.
This series is suited to a wide range of applications from machining of aluminum alloy to machining of hard brittle materials and cemented carbide.

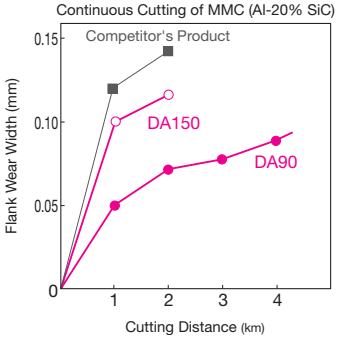
■ Grades, Features and Applications

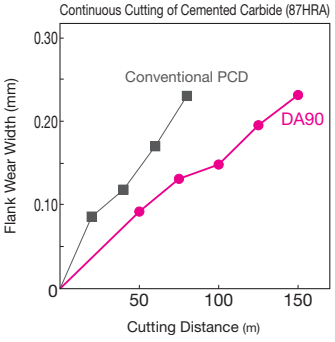
Grade		Features	Applications	Average grain size of diamond particles (μm)	Hardness HK (GPa)	Transverse Rupture Strength (GPa)
SUMIDIA BINDERLESS	NPD10	100% diamond structure that directly binds nano-order diamond particles with high strength. Demonstrates optimum wear and fracture resistance as well as the best edge sharpness.	· Finishing of Cemented Carbide · Machining of Hard Brittle Material (Ceramics)	up to 0.05	120 to 130	≈ 3.15
SUMIDIA	DA1000	High-density sintered grade made of ultra-fine grain diamond that demonstrates excellent wear and fracture resistance as well as edge sharpness.	· Machining of High-Silicon Aluminum Alloy · Roughing, Interrupted Machining and Finishing of Aluminum Alloy · Woodcraft or Wooden Board Cutting/Facing · General Finishing of Non-Ferrous Metals	up to 0.5	50 to 60	≈ 2.60
	DA2200	Sintered grade made of ultra-fine grain diamond that demonstrates optimum wear and fracture resistance and excellent edge sharpness.	· Roughing, Interrupted Machining and Finishing of Aluminum Alloy · Woodcraft or Wooden Board Cutting/Facing	0.5	45 to 55	≈ 2.45
	DA150	Grade with micro-grained sintered diamond particles. With strong diamond particle bonding, it has an excellent balance of machinability and wear resistance.	· General Finishing of Non-Ferrous Metals · Finishing of Semi-Sintered Ceramics and Mold-Extruded Products · FRP, Hard Rubber & Carbon Cutting · Wooden or Inorganic Board Cutting/Facing	5	50 to 60	≈ 1.95
	DA90	Contains coarser diamond particles than other grades, giving it good wear resistance suitable for the machining of carbides and high-silicon aluminum. Shows the highest diamond content for excellent wear resistance.	· Machining of High-Silicon Aluminum Alloy · Machining of Aluminum Composite (MMC) · Green or Semi-Sintered Cemented Carbide & Ceramic Roughing · Machining of Sintered Ceramics/Stone/Rock	up to 50	50 to 65	≈ 1.10

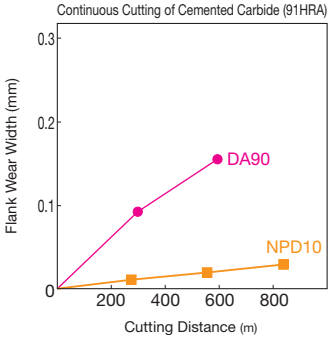
Transverse rupture strength measured with test piece equivalent to insert PCD layer

■ Performance









Work Material : Al-25% Si alloy
Tool Cat. No. : SPGN 120304
Cutting Conditions : vc=500m/min, f=0.1mm/rev, ap=0.2mm Dry

Work Material : MMC (Al-20%SiC)
Tool Cat. No. : CNMX 120408
Cutting Conditions : vc=350m/min, f=0.2mm/rev, ap=0.18mm Wet

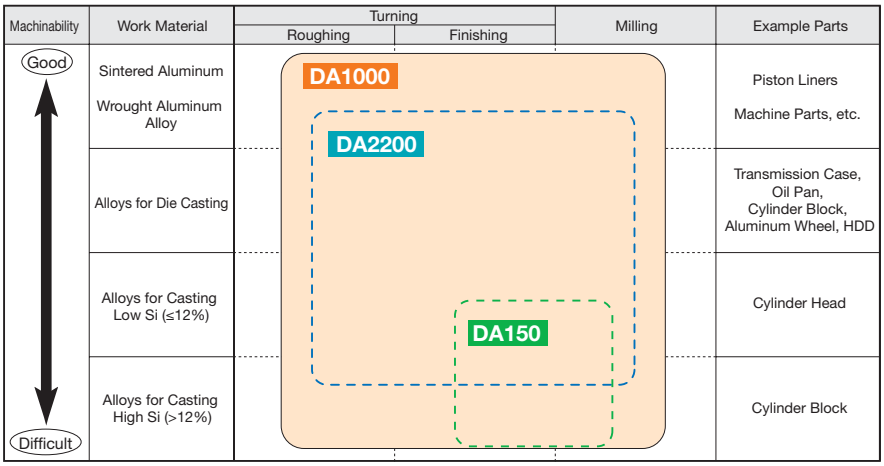
Work Material : Cemented carbide (87HRA)
Tool Cat. No. : NF-DCMW 070204
Cutting Conditions : vc = 20m/min, f = 0.1mm/rev, ap = 0.2mm Wet

Work Material : Cemented carbide (91HRA)
Tool Cat. No. : DCMW 11T304RH (NPD10) NF-DCMW 11T304(DA90)
Cutting Conditions : vc = 20m/min, f = 0.05mm/rev, ap = 0.05mm Dry

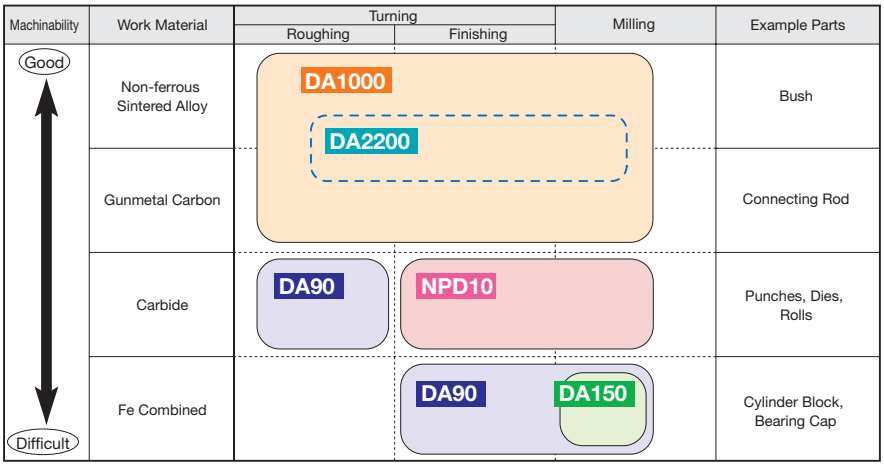
SUMIDIA series

■ Application Range

● Aluminum



● Non-aluminum



■ Recommended Cutting Conditions (Turning)

Work Material	Cutting Speed vc(m/min)	Feed Rate f(mm/rev)	Depth of Cut ap(mm)
Aluminum Alloy	up to 3,000	up to 0.2	up to 3
Copper Alloy	up to 1,000	up to 0.2	up to 3
Reinforced Plastics	up to 1,000	up to 0.4	up to 2
Wood or Organic Materials (Cutting, etc.)	up to 4,000	up to 0.4	—
Cemented Carbide	up to 30	up to 0.2	up to 0.5
Carbon	100 to 600	1	up to 2

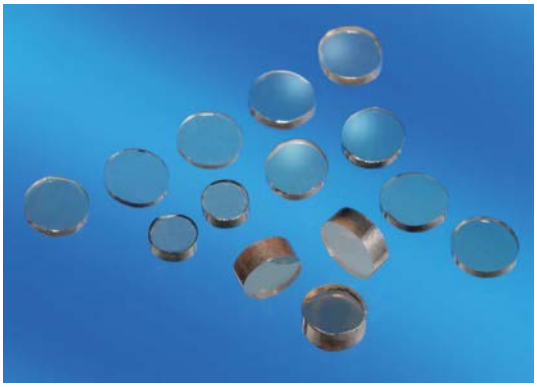
■ SUMIDIA Grinding Method

Functions		Description
Grinding Machine	—	(1) A special-purpose high-rigidity grinding machine. (2) Capable of wet grinding operations.
Grinding Wheel	Abrasive Grain	Diamond
	Grain Size	Rough Grinding: 400 mesh, Finish Grinding: 800 to 1,500 mesh
	Bond	Vitrified or Metal Bond Dedicated for Polycrystalline Diamond Tool
	Concentration	100 to 125
	Dressing	Use a WA stick with a mesh of about 400.
Grinding Conditions	Peripheral Speed	800 to 1,000m/min
	Table Rocking	30 to 60 cycle/min
	Grinding Fluid	Water-soluble Grinding Fluid (Solution type)
Others	—	(1) The rake face is generally lapped. (2) Inspect for edge chipping using a microscope with a magnification of 30 to 50 times. (3) Machining of non-ferrous metals requires a sharp cutting edge. (4) Surfaces that were cut by EDM should have more than 0.05mm ground off.

*Please contact us for details on regrinding of NPD10.

SUMIDIA BINDERLESS

Nano-polycrystalline Diamond

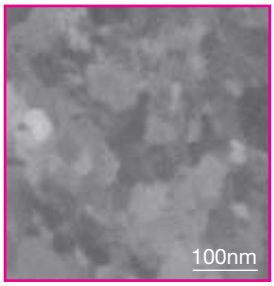


■ General Features

Nano-polycrystalline diamond is polycrystalline diamond that directly binds nano-order diamond particles with high strength without using any binders. This Sumitomo Electric proprietary material is harder than polycrystalline diamond with a binder, achieving excellent wear resistance and fracture resistance. SUMIDIA BINDERLESS tools use this super-high-performance nano-polycrystalline diamond material in their cutting edges.

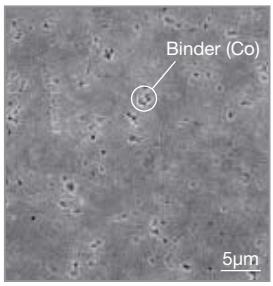
■ Comparison of Structures

Nano-polycrystalline Diamond Tool SEM Profile



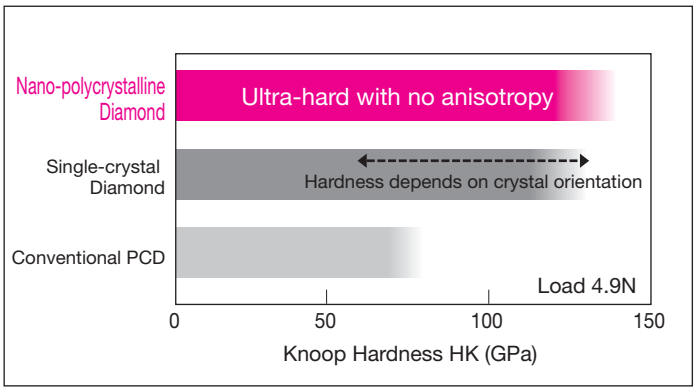
Diamond Particles (30 to 50nm)

Conventional PCD SEM Profile



Diamond Particles (1 to 10μm)

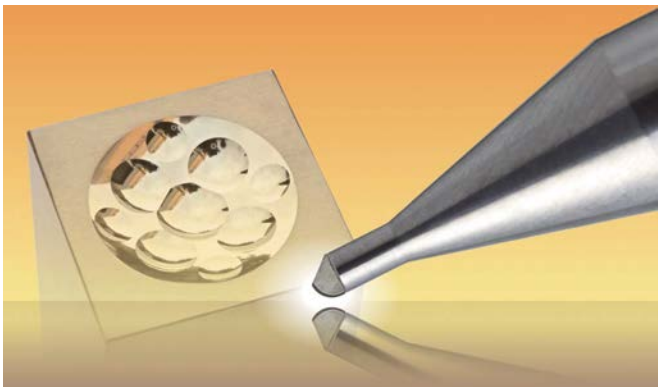
■ Hardness



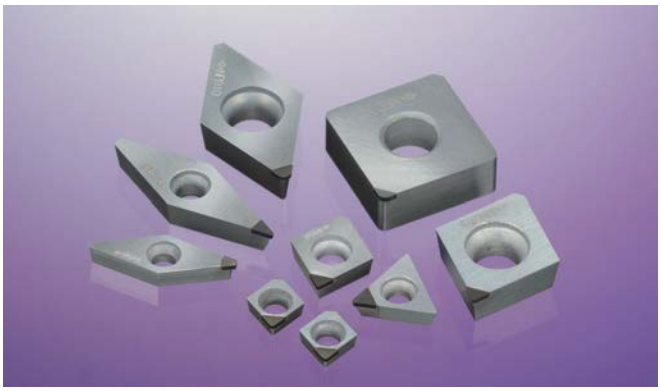
SUMIDIA BINDERLESS

■ Application Examples

● Ballnose Endmills and Radius Endmills (Cemented Carbide Machining) ☞M57~

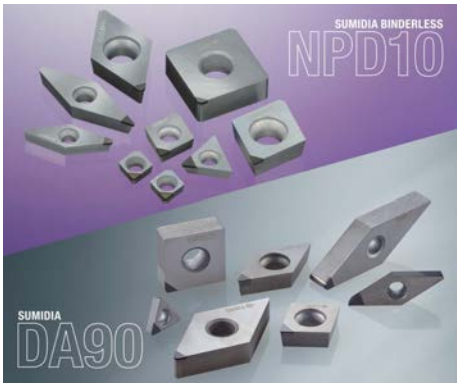


● Indexable Inserts (Cemented Carbide Machining) ☞M28



NPD10/DA90

VIDEO OF CUTTING



■ General Features

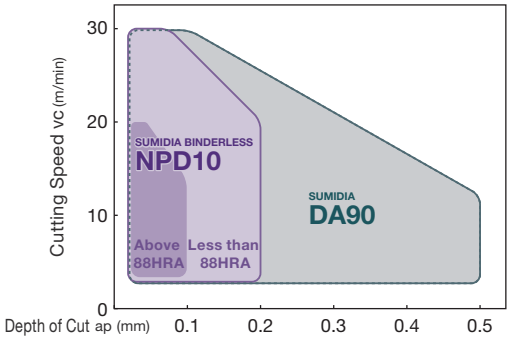
NPD10 is made from high-hardness nano-polycrystalline diamond. This is a pure diamond material, but unlike single-crystal diamonds, it has no anisotropy. It achieves extended tool life and machining accuracy superior to conventional diamond tools when machining hard brittle materials such as cemented carbide.

DA90 is a polycrystalline diamond grade in which coarse diamond particles have been sintered to form a dense structure. The high diamond content, with high wear resistance, makes it ideal for roughing of cemented carbide and hard brittle material. Optimised design and mass production technology have been developed, achieving the same performance as conventional tools with higher cost-performance.

■ Features

- **Ideal for finishing of hard brittle materials including cemented carbide (NPD10)**
  The outstanding wear resistance of nano-polycrystalline diamond enables high-precision machining of cemented carbides.
- **Superior dimensional accuracy maintained for a long time (NPD10)**
  Number of tool changes can be drastically reduced compared to conventional diamond tools, enabling work efficiency to be improved and total costs to be reduced.
- **Ideal for roughing of hard brittle materials including cemented carbide (DA90)**
  Stable tool life in sintered surface machining of cemented carbide and roughing of hard brittle materials thanks to the outstanding wear resistance of nano-polycrystalline diamond
- **Uses SUMIDIA NF Insert (DA90)**
  Optimised design and mass production technology have been developed, achieving the same performance as conventional tools with higher cost-performance.

■ Application Range (Cemented Carbide Machining)



■ Applications of NPD10 and DA90 (Cemented Carbide Machining)

Grade	SUMIDIA BINDERLESS NPD10		SUMIDIA DA90	
Dimensional Tolerance	◎	Best	△	The first recommendation is NPD10
Tool Life (Wear Resistance)	◎	Best ap = 0.2mm or below f=0.1mm/rev or below recommended	○	ap=0.2mm or above can also be used
Sintered surface machining of cemented carbide	×	Impossible	◎	Best
Machined surface quality	◎	Best	△	The first recommendation is NPD10

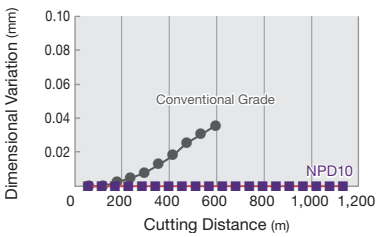
■ Recommended Cutting Conditions (Cemented Carbide Machining)

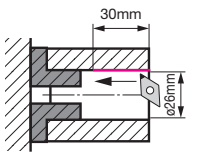
Work Material				Grade	Cutting Conditions		
Classification		Hardness (HRA)	Our Grades		Cutting Speed vc (m/min)	Feed Rate f (mm/rev)	Depth of Cut ap (mm)
VM, VC	40	88 or more	G5,D2	NPD10	5 - **15** - 20	0.03 - **0.05** - 0.07	0.03 - **0.05** - 0.07
VM, VC	70,60,50	83 to less than 88	G7,G6	NPD10	5 - **20** - 30	0.03 - **0.10** - 0.20	0.03 - **0.10** - 0.20
VM, VC	—	83 or more	G7,G6 G5,D2	DA90	5 - **20** - 30	0.03 - **0.10** - 0.20	0.03 - **0.20** - 0.50

Min. - **Optimum** - Max. Coolant: Dry (NPD10)/Wet (DA90)

■ Machining Precision (NPD10)

Internal boring of cemented carbide: VM30 (91HRA)



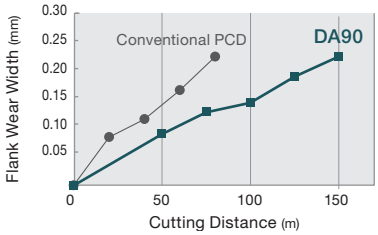


NPD10 shows no dimensional variation even after 1,100m of cutting.

Work Material : Cemented carbide: VM30 (91HRA)
Tool Cat. No. : DCMW 11T304RH
Cutting Conditions : vc=20m/min, f=0.05mm/rev, ap=0.05mm Dry

■ Wear Resistance (DA90)

External turning of cemented carbide: VC50 (87HRA)



Work Material : Cemented carbide: VC50 (87HRA)
Tool : NF-DCMW 070204
Cutting Conditions : vc=20m/min, f=0.1mm/rev, ap=0.2mm Wet

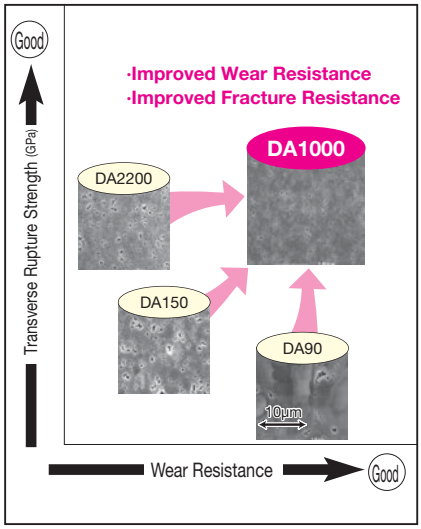
DA1000

■ Features

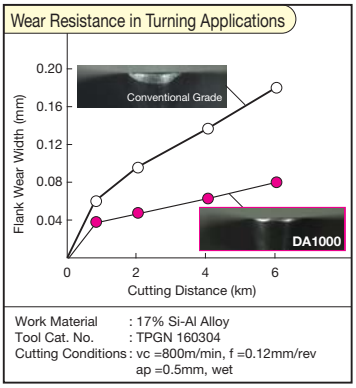
Ultra-high-density sintered ultra-fine grained diamond

- Significantly improved surface roughness on machined surfaces
- Excellent wear resistance and strength
- High-performance, high-precision, high-efficiency machining of all aluminum and non-ferrous alloys

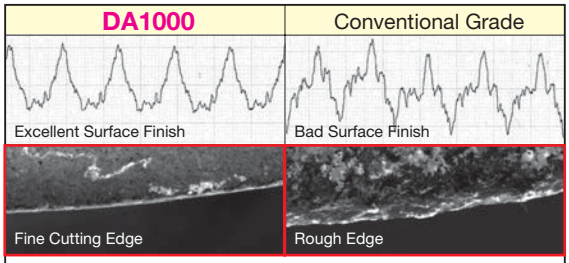
■ Position of DA1000



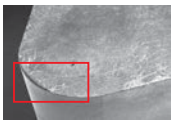
■ Cutting Performance



Work Material : 17% Si-Al Alloy
Tool Cat. No. : TPGN 160304
Cutting Conditions : vc =800m/min, f =0.12mm/rev
ap =0.5mm, wet

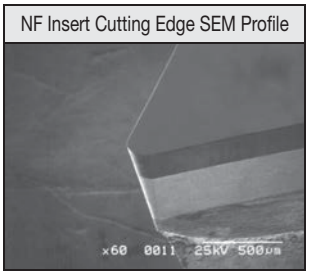


Work Material : 17% Si-Al Alloy
Tool Cat. No. : TPGW 160308
Cutting Conditions : vc=1,000m/min, f=0.15mm/rev
ap=0.2mm Wet



■ NF Insert

The NF type SUMIDIA insert uses optimised design and improved mass production techniques that maintain the good basic performance of DA1000 yet offer higher cost efficiency. It makes the most of the SUMIDIA DA1000 grade, with excellent fracture and wear resistance and good work material finished surface roughness.



High-precision cutting edge quality

● Total cost effectiveness with high performance and lower price

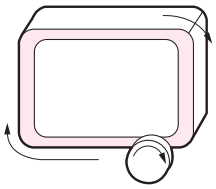
· Optimum design utilizing improved mass production techniques provides a lower cost.
· Regrindable type results in huge total cost reduction.

● Wide lineup from general turning to milling

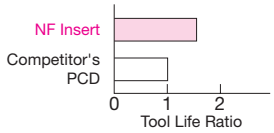
· Wide range of items in stock for small diameter boring and external turning to milling.
· Negative/positive type inserts that can be used on standard lever-lock and pin-lock type holder are also in stock.

■ Application Examples

● Milling of Aluminum Alloy Oil Pump Cover

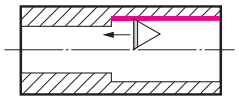


Results:
1.5 times longer tool life than competitors' PCD, with higher cost performance.

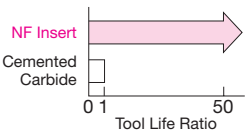


Work Material : ADC12, Tool Cat. No.: NF-TEEN32R
Cutting Conditions : vc = 3,000m/min, fz = 0.06mm/t, ap = 0.2mm Wet

● Boring of Aluminum Valve Bore



Results:
No initial breakage, tool life is more than 50 times that of carbides.



Work Material : ADC12, Tool Cat. No.: NF-TPGN110304P
Cutting Conditions : vc = 530m/min, f = 0.05mm/rev, ap = 0.2mm Wet

LD type/GD type

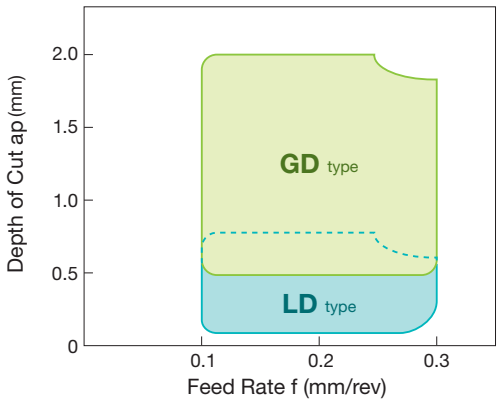
VIDEO OF CUTTING

■ Features

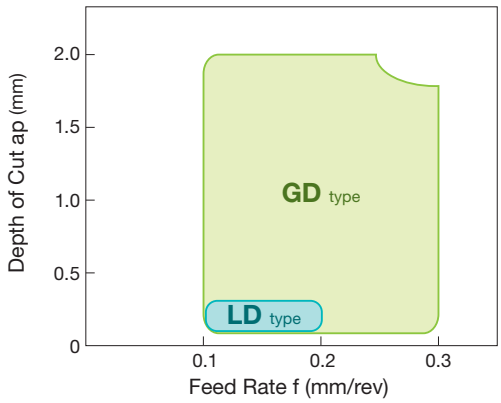
- SUMIDIA insert with chipbreaker.
- Provides excellent chip control in medium finishing and finishing of aluminum alloy.
- Solves chip control problems and dramatically improves work efficiency.
- Achieves long, stable tool life by employing high-toughness grade DA1000.

■ Application Range

● Wrought Aluminum Alloy (A6061)

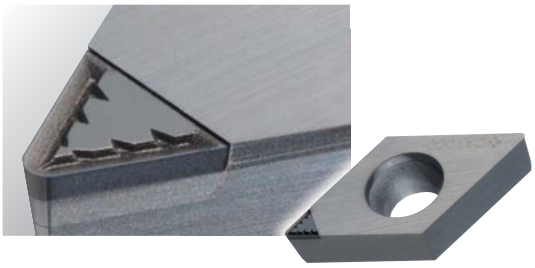


● Cast Aluminum Alloy (ADC12)



LD type Chipbreaker for Finishing

Provides excellent chip control in finishing

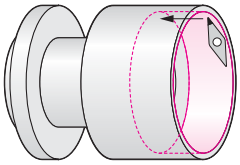


■ Cutting Performance

For Wrought Aluminum Alloy Machining

● Machining Details: Internal Boring of Machine Components

Provides good chip control at shallow depths of cut for wrought materials



BREAK MASTER LD type

Without Chipbreaker

Work Material : A6061, Tool Cat. No.: NF-VCMT110302N-LD (DA1000)
Cutting Conditions : vc = 200m/min, f = 0.20mm/rev, ap = 0.10mm Wet

GD type Chipbreaker for Medium Finishing

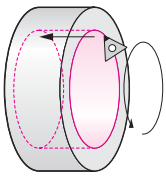
Provides excellent chip control in medium finishing

■ Cutting Performance

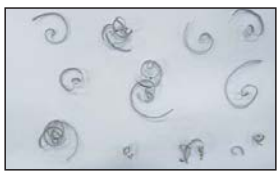
For Aluminum Alloy Casting Machining

● Machining Details: Internal Boring of Transmission Components

Finely breaks chips in machining of cast materials



BREAK MASTER GD type

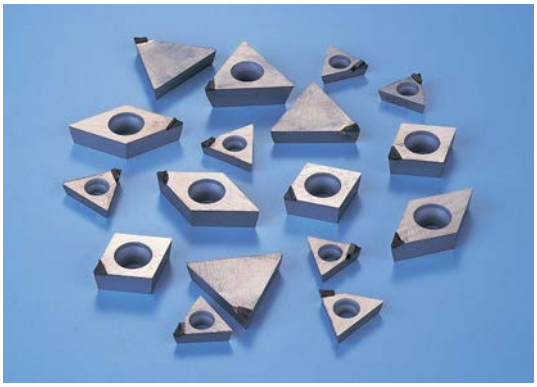


Without Chipbreaker

Work Material : ADC12, Tool Cat. No.: NF-TPMT110304N-GD (DA1000)
Cutting Conditions: vc = 400m/min, f = 0.23mm/rev, ap = 1.20mm Wet

Note: Regrinding this product will adversely affect chip control performance.

DM type



■ Features

● Economy One-Use type

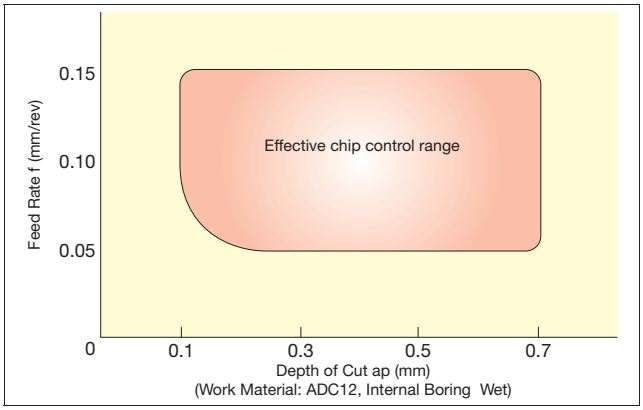
Familiar to users of SUMIBORON one-use inserts, now available in SUMIDIA.

● Cutting Edge with Built-in Chipbreaker for Effective Chip Control

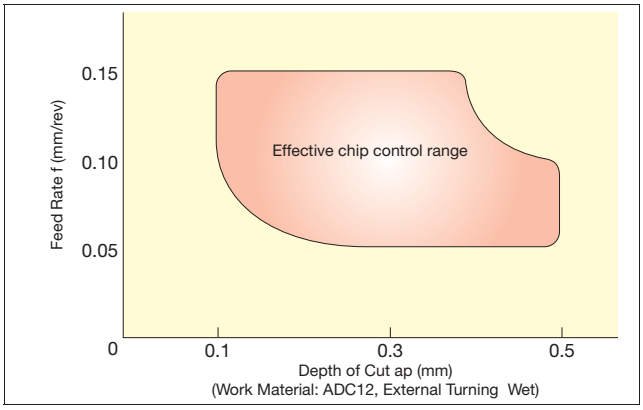
DM type chipbreaker solves chip control problems and greatly improves efficiency.

■ Application Range

● For Internal Boring



● External Turning & Facing (Insert Shape: 55°/80° Diamond type)



■ Recommended Cutting Conditions

● Internal Boring (Insert Shape: Triangular type)

Feed Rate f	Depth of Cut ap	Coolant
up to 0.15 mm/rev	up to 0.7mm	Wet

● External Profiling (Insert Shape: 55°/80° Diamond type)

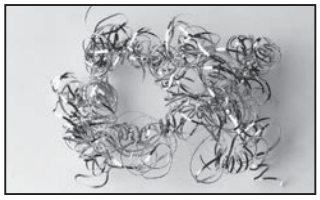
Feed Rate f	Depth of Cut ap	Coolant
up to 0.15 mm/rev	up to 0.5mm	Wet

For facing, depth of cut should be less than 0.4mm.

■ Chip Control

● Chips Produced by BREAK MASTER DM type

● Chips with No Chipbreaker



■ Application Examples

Machining Details	Cutting Conditions	Results
Internal Boring	Work Material: AC2A-T6 vc = 300m/min f = 0.06mm/rev ap = 0.35mm Wet	With the required finished surface roughness of Ra = 1μm or less, the chips curled at lengths of 2mm or so, and did not remain within the work material.

■ Series

Machining Details	Internal Boring	External Turning and Facing
Cartridge Unit	NU-TPMR1103 type	—
	NU-TPMR1603 type	—
Tool Holder	NU-TPMT0802 type	NU-CCMT0602 type
	NU-TPMT0902 type	NU-CCMT09T3 type
	NU-TPMT1102 type	NU-DCMT0702 type
	NU-TPMT1103 type	NU-DCMT11T3 type
	NU-TPMT1604 type	—

Insert Identification Code

Regrindable type

CNMX 120408 (B)

(1) (2)

(1) Insert ISO Code
(ISO Standard Classification) B2, B3

(2) Additional Information
Refer to Table 1

Table 1 (2) Additional Information

Symbol	Code Description
R	Right-handed
L	Left-handed
B	Full-top PCD type
-WF	Edge with Special Land for Glossy Finishing of Aluminum Wheels
RH	Honing (Cutting Edge Treatment)

Single Corner type

NF - CNMX 120408 (P)

(1) (2) (3)

(1) Type Code
Refer to Table 2

(2) Insert ISO Code
(ISO Standard Classification) B2, B3

(3) Additional Information
Refer to Table 3

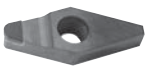
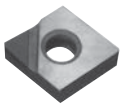
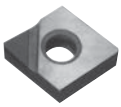
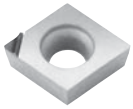
Table 2 (1) Type Code

Symbol	Code Description
NF	NF Insert M6
NU	One-Use Insert (Disposable)

Table 3 (3) Additional Information

Symbol	Code Description
L	Left-handed
P	Full-length Cutting Edge type
N-LD	Chipbreaker type (Neutral) M7
N-GD	
R-DM	Chipbreaker type (Right -handed) M8
L-DM	Chipbreaker type (Left-handed) M8

Insert Shape

Full-top PCD type	Edge With Special Land for Glossy Finishing of Aluminum Wheels	NF Insert	One-Use Insert	Full-length Cutting Edge type	Chipbreaker type
					

C 80° Diamond type

Neg.-Pos.

CNMX 1204●●

Dimensions (mm)	Inscribed Circle IC	12.70	Hole Dia.	5.16
	Thickness S	4.76		

Applicable External Holders ☞ C10 to C12
Applicable Internal Holders ☞ E15, E23 to E25

7° Pos.

CCMW 03X1●●

Dimensions (mm)	Inscribed Circle IC	3.5	Hole Dia.	1.9
	Thickness S	1.4		

Applicable Internal Holders ☞ E18, E20

CCMW 04X1●●

Dimensions (mm)	Inscribed Circle IC	4.3	Hole Dia.	2.3
	Thickness S	1.8		

Applicable Internal Holders ☞ E18, E20

CCM■ 0602●●

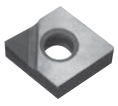
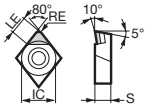
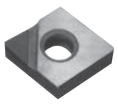
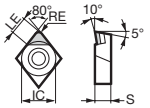
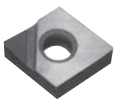
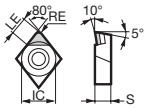
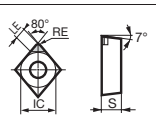
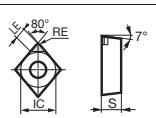
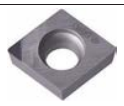
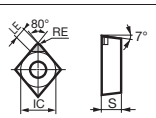
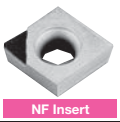
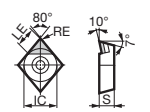
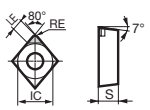
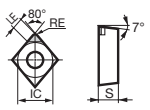
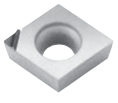
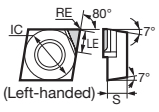
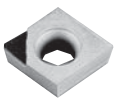
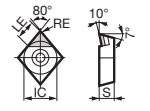
Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	2.8
	Thickness S	2.38		

Applicable External Holders ☞ C13, D13, D17, D22 to D23
Applicable Internal Holders ☞ E18 to E20

(Legend) General Cutting ●: 1st Recommendation

Recommended Application
- N Non-Ferrous Metal ●
- Carbide/Hard Brittle Material ●

Dimensions (mm)

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
 NF Insert		NF-CNMX 120402	0.2	5.5	—	—	●	▲
		120404	0.4	5.4	—	—	●	▲
		120408	0.8	5.4	—	—	●	▲
		120412	1.2	5.3	—	—	●	▲
 One-Use		NU-CNMX 120402	0.2	2.8	—	—		
		120404	0.4	2.8	—	—		
		120408	0.8	2.7	—	—		
		120412	1.2	2.6	—	—		
		CNMX 120402	0.2	5.5			●	
		120404	0.4	5.4		●	●	▲
		120408	0.8	5.4		●	●	▲
		120412	1.2	5.3		●		
NF Insert		NF-CCMW 03X102	0.2	1.1	●	—	—	—
		03X104	0.4	1.1	●	—	—	—
NF Insert		NF-CCMW 04X102	0.2	1.5	●	—	—	—
		04X104	0.4	1.5	●	—	—	—
 NF Insert		NF-CCMW 060202	0.2	2.4	●	—	—	—
		060204	0.4	2.4	●	—	—	—
 NF Insert		NF-CCMT 060201	0.1	2.8	—	—	●	▲
		060202	0.2	2.8	—	—	●	▲
		060204	0.4	2.8	—	—	●	▲
BREAK MASTER		NF-CCMT 060202N-LD	0.2	2.9	—	—	●	—
		060204N-LD	0.4	2.9	—	—	●	—
BREAK MASTER		NF-CCMT 060202N-GD	0.2	2.9	—	—	●	—
		060204N-GD	0.4	2.9	—	—	●	—
 BREAK MASTER	 (Left-handed)	NU-CCMT 060202R-DM	0.2	2.5	—	●	—	—
		060202L-DM	0.2	2.5	—	●	—	—
		060204R-DM	0.4	2.5	—	●	—	—
		060204L-DM	0.4	2.5	—	●	—	—
		CCMT 060201	0.1	3.3		●		
		060202	0.2	3.2		●		
		060204	0.4	3.1		●		

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIDIA Inserts

C 80° Diamond type

7° Pos.

CCM■ 09T3●●

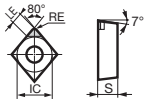
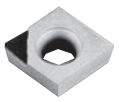
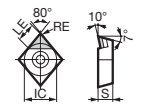
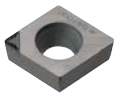
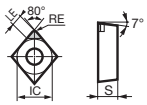
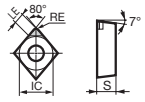
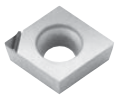
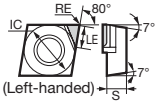
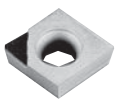
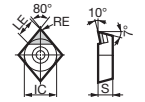
Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	4.4
	Thickness S	3.97		

Applicable External Holders ☞ C13, D13, D17, D22 to D23

Applicable Internal Holders ☞ E12, E18 to E20

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

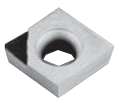
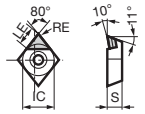
Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		NF-CCMW 09T302	0.2	2.4	●	—	—	—
		09T304	0.4	2.4	●	—	—	—
		09T308	0.8	2.3	●	—	—	—
 NF Insert		NF-CCMT 09T301	0.1	2.8	—	—	●	▲
		09T302	0.2	2.8	—	—	●	▲
		09T304	0.4	2.8	—	—	●	▲
		09T308	0.8	2.7	—	—	●	▲
 BREAK MASTER		NF-CCMT 09T302N-LD	0.2	2.9	—	—	●	—
		09T304N-LD	0.4	2.9	—	—	●	—
		09T308N-LD	0.8	2.8	—	—	●	—
BREAK MASTER		NF-CCMT 09T302N-GD	0.2	2.9	—	—	●	—
		09T304N-GD	0.4	2.9	—	—	●	—
		09T308N-GD	0.8	2.8	—	—	●	—
 BREAK MASTER		NU-CCMT 09T302R-DM	0.2	2.5	—	●	—	—
		09T302L-DM	0.2	2.5	—	●	—	—
		09T304R-DM	0.4	2.5	—	●	—	—
		09T304L-DM	0.4	2.5	—	●	—	—
		CCMT 09T301	0.1	4.2		●		
		09T302	0.2	4.2		●		
		09T304	0.4	4.2		●		

11° Pos.

CPMT 0802●●

Dimensions (mm)	Inscribed Circle IC	7.94	Hole Dia.	3.4
	Thickness S	2.38		

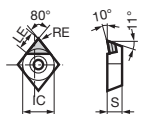
Applicable Internal Holders ☞ E21 to E22

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
		CPMT 080202	0.2	4.2			●	▲
		080204	0.4	4.2			●	▲
		080208	0.8	4.1			●	▲

CPMT 0903●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	4.4
	Thickness S	3.18		

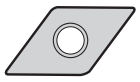
Applicable Internal Holders ☞ E12, E21 to E22

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		NF-CPMT 090302	0.2	2.8	—	—	●	▲
		090304	0.4	2.8	—	—	●	▲
		090308	0.8	2.7	—	—	●	▲

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIDIA Inserts

D 55° Diamond type



Neg.

DNMA 1504●●

Dimensions (mm)	Inscribed Circle IC	12.70	Hole Dia.	5.6
	Thickness S	4.76		

Applicable External Holders ☞C14 to C16
Applicable Internal Holders ☞E15, E31 to E33

Neg.-Pos.

DNMX 1504●●

Dimensions (mm)	Inscribed Circle IC	12.70	Hole Dia.	5.16
	Thickness S	4.76		

Applicable External Holders ☞C14 to C16
Applicable Internal Holders ☞E15, E31 to E33

7° Pos.

DCM■ 0702●●

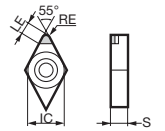
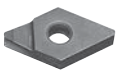
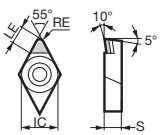
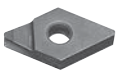
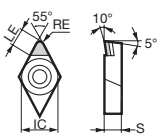
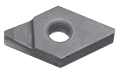
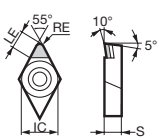
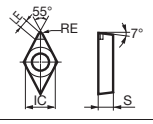
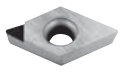
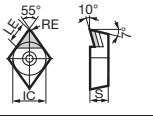
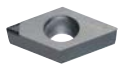
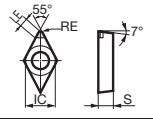
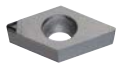
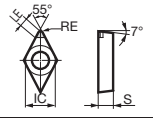
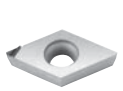
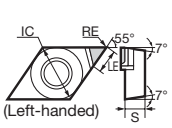
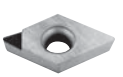
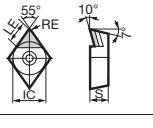
Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	2.8
	Thickness S	2.38		

Applicable External Holders ☞C19, D14, D18 to D19, D24 to D25
Applicable Internal Holders ☞E16, E26 to E30

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

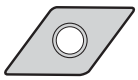
Dimensions (mm) | SUMIDIA

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert		**NF-DNMA 150408**	0.8	2.0	●	—	—	—
		150412	1.2	2.0	●	—	—	—
 NF Insert		**NF-DNMX 150402**	0.2	7.4	—	—	●	▲
		150404	0.4	7.1	—	—	●	▲
		150408	0.8	6.7	—	—	●	▲
		150412	1.2	6.2	—	—	●	▲
 One-Use		**NU-DNMX 150402**	0.2	3.0	—	—		
		150404	0.4	2.8	—	—		
		150408	0.8	2.5	—	—		
		150412	1.2	2.1	—	—		
		**DNMX 150402**	0.2	6.4			●	
		150404	0.4	6.2		●	●	▲
		150408	0.8	5.8		●	●	▲
		150412	1.2	5.4		●	●	▲
NF Insert		**NF-DCMW 070202**	0.2	2.6	●	—	—	—
		070204	0.4	2.4	●	—	—	—
 NF Insert		**NF-DCMT 070201**	0.1	3.0	—	—	●	▲
		070202	0.2	3.0	—	—	●	▲
		070204	0.4	2.8	—	—	●	▲
 BREAK MASTER		**NF-DCMT 070202N-LD**	0.2	3.1	—	—	●	—
		070204N-LD	0.4	2.9	—	—	●	—
 BREAK MASTER		**NF-DCMT 070202N-GD**	0.2	3.1	—	—	●	—
		070204N-GD	0.4	2.9	—	—	●	—
 BREAK MASTER	 (Left-handed)	**NU-DCMT 070202R-DM**	0.2	2.9	—	●	—	—
		070202L-DM	0.2	2.9	—	●	—	—
		070204R-DM	0.4	2.7	—	●	—	—
		070204L-DM	0.4	2.7	—	●	—	—
		**DCMT 070201**	0.1	4.3		●		
		070202	0.2	4.2		●		
		070204	0.4	4.0		●		

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIDIA Inserts

D — 55° Diamond type



7° Pos.

DCM■ 11T3●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	4.4
	Thickness S	3.97		

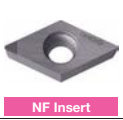
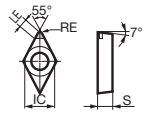
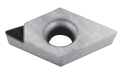
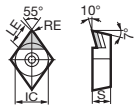
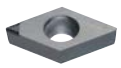
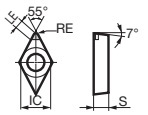
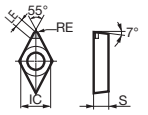
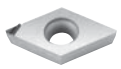
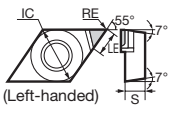
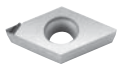
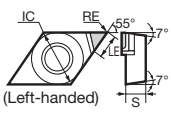
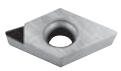
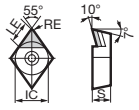
Applicable External Holders ☞ C19, D14, D18 to D19, D24 to D25

Applicable Internal Holders ☞ E13, E26 to E30

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

Dimensions (mm)

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
 NF Insert		**NF-DCMW 11T302**	0.2	2.6	●	—	—	—
		11T304	0.4	2.4	●	—	—	—
		11T308	0.8	2.0	●	—	—	—
 NF Insert		**NF-DCMT 11T301**	0.1	3.0	—	—	●	▲
		11T302	0.2	3.0	—	—	●	▲
		11T304	0.4	2.8	—	—	●	▲
		11T308	0.8	2.4	—	—	●	▲
 BREAK MASTER		**NF-DCMT 11T302N-LD**	0.2	3.1	—	—	●	—
		11T304N-LD	0.4	2.9	—	—	●	—
		11T308N-LD	0.8	2.5	—	—	●	—
BREAK MASTER		**NF-DCMT 11T302N-GD**	0.2	3.1	—	—	●	—
		11T304N-GD	0.4	2.9	—	—	●	—
		11T308N-GD	0.8	2.5	—	—	●	—
 BREAK MASTER	 (Left-handed)	**NU-DCMT 11T302R-DM**	0.2	2.9	—	●	—	—
		11T302L-DM	0.2	2.9	—	●	—	—
 BREAK MASTER	 (Left-handed)	**NU-DCMT 11T304R-DM**	0.4	2.7	—	●	—	—
		11T304L-DM	0.4	2.7	—	●	—	—
		**DCMT 11T301**	0.1	4.3		●		
		11T302	0.2	4.2		●		
		11T304	0.4	4.0		●		

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

S Square type

Neg.

SNMA 1204●●

Dimensions (mm)				
	Inscribed Circle IC	12.70	Hole Dia.	4.76
	Thickness S	5.16		

Applicable External Holders ☞ C21 to C26
Applicable Internal Holders ☞ E39 to E41

7° Pos.

SCMT 0702●●

Dimensions (mm)				
	Inscribed Circle IC	7.94	Hole Dia.	3.4
	Thickness S	2.38		

Applicable External Holders ☞ D26

11° Pos.

SPGN 0903●●

Dimensions (mm)				
	Inscribed Circle IC	9.525	Hole Dia.	—
	Thickness S	3.18		

Applicable Internal Holders ☞ E37
Applicable Cartridge: CE type

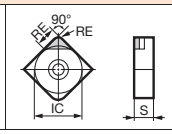
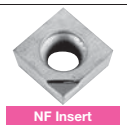
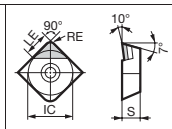
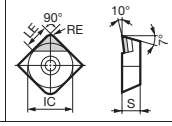
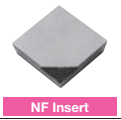
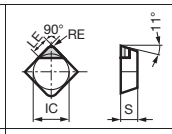
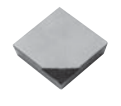
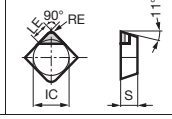
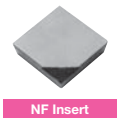
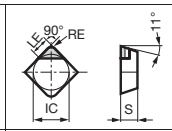
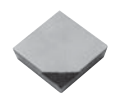
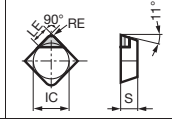
SPGN 1203●●

Dimensions (mm)				
	Inscribed Circle IC	12.70	Hole Dia.	—
	Thickness S	3.18		

Applicable External Holders ☞ C27 to C28
Applicable Cartridge: CE type

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		NF-SNMA 120408	0.8	2.4	●	—	—	—
		120412	1.2	2.4	●	—	—	—
 NF Insert		NF-SCMT 070201	0.1	2.9	—	—	●	
		070202	0.2	2.9	—	—	●	
		070204	0.4	2.9	—	—	●	
		SCMT 070201	0.1	2.9	—	●		
		070202	0.2	2.9		●		
		070204	0.4	2.9		●		
 NF Insert		NF-SPGN 090304	0.4	4.8	—	—	●	▲
		090308	0.8	4.8	—	—	●	▲
		SPGN 090302	0.2	4.8				
		090304	0.4	4.8		●		
		090308	0.8	4.8				
 NF Insert		NF-SPGN 120304	0.4	4.8	—	—	●	▲
		120308	0.8	4.8	—	—	●	▲
		SPGN 120304	0.4	4.8		●		
		120308	0.8	4.8				
		120312	1.2	4.8				

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIDIA Inserts

S Square type

20° Pos.

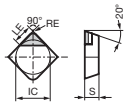
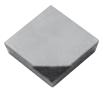
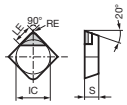
SEGN 0903●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	—
	Thickness S	3.18		

Applicable Cartridge: CE type

(Legend) General Cutting ●: 1st Recommendation

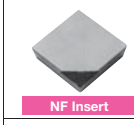
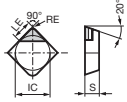
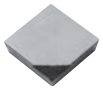
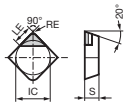
Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	Dimensions (mm) SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		NF-SEGN 090302	0.2	4.8	—	—	●	
		SEGN 090302	0.2	4.8		●		
		090304	0.4	4.8				
		090308	0.8	4.8				

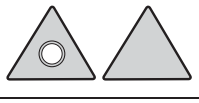
SEGN 1203●●

Dimensions (mm)	Inscribed Circle IC	12.70	Hole Dia.	—
	Thickness S	3.18		

Applicable Cartridge: CE type

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
 NF Insert		NF-SEGN 120302	0.2	4.8	—	—	●	
		SEGN 120302	0.2	4.8		●		
		120304	0.4	4.8				
		120308	0.8	4.8				

T Triangular type



Neg.-Pos.

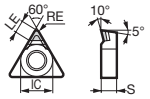
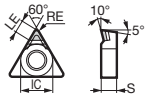
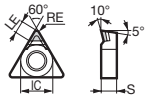
TNMX 1604●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	3.81
	Thickness S	4.76		

Applicable External Holders ☞C29 to C35, D16, D20
Applicable Internal Holders ☞E15, E47 to E49

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

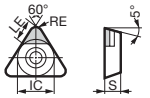
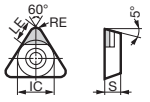
Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		NF-TNMX 160402	0.2	3.7	—	—	●	▲
		160404	0.4	3.6	—	—	●	▲
		160408	0.8	3.3	—	—	●	▲
One-Use		NU-TNMX 160402	0.2	3.0	—	—		
		160404	0.4	2.9	—	—		
		160408	0.8	2.6	—	—		
		TNMX 160402	0.2	3.7			●	
		160404	0.4	3.6		●	●	▲
		160408	0.8	3.3		●	●	▲
		160412	1.2	3.0				

5° Pos.

TBGW 0601●●

Dimensions (mm)	Inscribed Circle IC	3.97	Hole Dia.	2.2
	Thickness S	1.59		

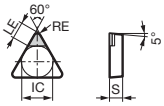
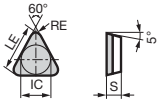
Applicable Internal Holders ☞E42, E44

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert		NF-TBGW 060102	0.2	2.3	—	—	●	▲
		060104	0.4	2.2	—	—	●	▲
		TBGW 060102	0.2	2.3		●		
		060104	0.4	2.1		●		

TBGN 0601●●

Dimensions (mm)	Inscribed Circle IC	3.97	Hole Dia.	—
	Thickness S	1.59		

Applicable Internal Holders ☞E80

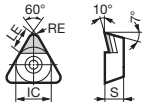
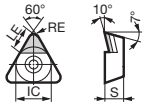
Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert		NF-TBGN 060102	0.2	2.1	—	—	●	▲
		060104	0.4	2.0	—	—	●	▲
		TBGN 060102B	0.2	6.5		●	●	
		060104B	0.4	6.2		●	●	
		060108B	0.8	5.7				

7° Pos.

TCMT 0902●●

Dimensions (mm)	Inscribed Circle IC	5.56	Hole Dia.	2.5
	Thickness S	2.38		

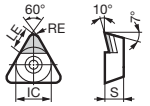
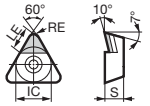
Applicable External Holders ☞D27

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert		NF-TCMT 090202	0.2	2.9	—	—	●	▲
		090204	0.4	2.8	—	—	●	▲
		TCMT 090201	0.1	2.8	—			
		090202	0.2	2.7		●		
		090204	0.4	2.6		●		

TCMT 1102●●

Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	2.8
	Thickness S	2.38		

Applicable External Holders ☞D27

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert		NF-TCMT 110201	0.1	3.0	—	—	●	▲
		110202	0.2	2.9	—	—	●	▲
		110204	0.4	2.8	—	—	●	▲
		TCMT 110201	0.1	2.8	—			
		110202	0.2	2.7		●		
		110204	0.4	2.6		●		

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

11° Pos.

TPGW 0802●●

Dimensions (mm)	Inscribed Circle IC	4.76	Hole Dia.	2.4
	Thickness S	2.38		

Applicable Internal Holders ☞E42 to E45

TPM■ 0802●●

Dimensions (mm)	Inscribed Circle IC	4.76	Hole Dia.	2.4
	Thickness S	2.38		

Applicable Internal Holders ☞E42 to E45

TPGW 0902●●

Dimensions (mm)	Inscribed Circle IC	5.56	Hole Dia.	2.8
	Thickness S	2.38		

Applicable Internal Holders ☞E42

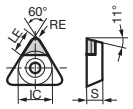
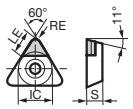
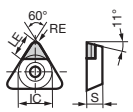
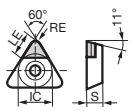
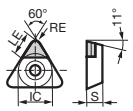
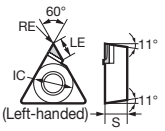
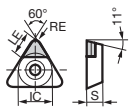
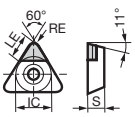
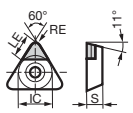
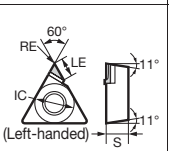
TPMT 0902●●

Dimensions (mm)	Inscribed Circle IC	5.56	Hole Dia.	2.8
	Thickness S	2.38		

Applicable Internal Holders ☞E42

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		NF-TPGW 080201	0.1	3.1	—	—	●	▲
		080202	0.2	3.0	—	—	●	▲
		080204	0.4	2.9	—	—	●	▲
		TPGW 080202	0.2	2.9		●		
		080204	0.4	2.7		●		
		080208	0.8	2.4				
NF Insert		NF-TPMW 080202	0.2	2.5	●	—	—	—
		080204	0.4	2.4	●	—	—	—
BREAK MASTER		NF-TPMT 080202N-LD	0.2	2.9	—	—	●	—
		080204N-LD	0.4	2.8	—	—	●	—
BREAK MASTER		NF-TPMT 080202N-GD	0.2	2.9	—	—	●	—
		080204N-GD	0.4	2.8	—	—	●	—
BREAK MASTER		NU-TPMT 080202R-DM	0.2	2.5	—		—	—
		080202L-DM	0.2	2.5	—	●	—	—
		080204R-DM	0.4	2.3	—		—	—
		080204L-DM	0.4	2.3	—	●	—	—
NF Insert		NF-TPGW 090202	0.2	3.1	—	—	●	▲
		090204	0.4	2.9	—	—	●	▲
BREAK MASTER		NF-TPMT 090202N-LD	0.2	3.1	—	—	●	—
		090204N-LD	0.4	2.9	—	—	●	—
BREAK MASTER		NF-TPMT 090202N-GD	0.2	3.1	—	—	●	—
		090204N-GD	0.4	2.9	—	—	●	—
BREAK MASTER		NU-TPMT 090202R-DM	0.2	2.5	—		—	—
		090202L-DM	0.2	2.5	—	●	—	—
		090204R-DM	0.4	2.3	—		—	—
		090204L-DM	0.4	2.3	—	●	—	—

SUMIDIA Inserts

T Triangular type

11° Pos.

TPGW 1102●●

Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	2.8
	Thickness S	2.38		

Applicable Internal Holders ☞E42

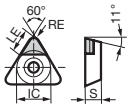
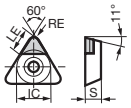
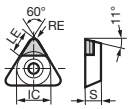
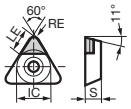
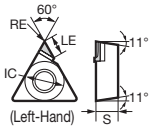
TPMT 1102●●

Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	2.8
	Thickness S	2.38		

Applicable Internal Holders ☞E42

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		**NF-TPGW 110201**	0.1	3.1	—	—	●	▲
		110202	0.2	3.0	—	—	●	▲
		110204	0.4	2.9	—	—	●	▲
		**TPGW 110202**	0.2	3.7		●		
		110204	0.4	3.6		●		
		110208	0.8	3.3				
BREAK MASTER		**NF-TPMT 110202N-LD**	0.2	3.1	—	—	●	—
		110204N-LD	0.4	2.9	—	—	●	—
BREAK MASTER		**NF-TPMT 110202N-GD**	0.2	3.1	—	—	●	—
		110204N-GD	0.4	2.9	—	—	●	—
BREAK MASTER	 (Left-Hand)	**NU-TPMT 110202R-DM**	0.2	2.5	—		—	—
		110202L-DM	0.2	2.5	—	●	—	—
		110204R-DM	0.4	2.3	—		—	—
		110204L-DM	0.4	2.3	—	●	—	—

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

11° Pos.

TPGW 1103●●

Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	3.4
	Thickness S	3.18		

Applicable Internal Holders E14, E42 to E45

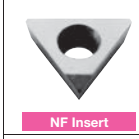
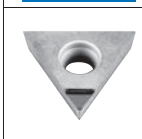
TPM■ 1103●●

Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	3.4
	Thickness S	3.18		

Applicable Internal Holders E14, E42 to E45

(Legend) General Cutting ●: 1st Recommendation

Recommended Application: N Non-Ferrous Metal ●; Carbide/Hard Brittle Material ●

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
 NF Insert	**NF-TPGW 110301**	0.1	3.1	—	—	●	▲
	110302	0.2	3.0	—	—	●	▲
	110304	0.4	2.9	—	—	●	▲
	110308	0.8	2.7	—	—	●	▲
NF Insert	**NF-TPGW 110304P** New	0.4	10.4	—	—	●	—
	110308P New	0.8	9.8	—	—	●	—
	TPGW 110300	0.05	3.8	—			
	110302	0.2	3.7		●		
	110304	0.4	3.6		●		
	110308	0.8	3.3		●		
NF Insert	**NF-TPMW 110302**	0.2	2.5	●	—	—	—
	110304	0.4	2.4	●	—	—	—
	110308	0.8	2.1	●	—	—	—
NF Insert	**NF-TPMT 110301**	0.1	3.0	—	—	●	▲
	110302	0.2	2.9	—	—	●	▲
	110304	0.4	2.8	—	—	●	▲
	110308	0.8	2.5	—	—	●	▲
BREAK MASTER	**NF-TPMT 110302N-LD**	0.2	3.1	—	—	●	—
	110304N-LD	0.4	2.9	—	—	●	—
	110308N-LD	0.8	2.7	—	—	●	—
BREAK MASTER	**NF-TPMT 110302N-GD**	0.2	3.1	—	—	●	—
	110304N-GD	0.4	2.9	—	—	●	—
	110308N-GD	0.8	2.7	—	—	●	—
BREAK MASTER	**NU-TPMT 110302R-DM**	0.2	2.5	—		—	—
	110302L-DM	0.2	2.5	—	●	—	—
	110304R-DM	0.4	2.3	—		—	—
	110304L-DM	0.4	2.3	—	●	—	—
	**TPMT 110300**	0.05	3.7	—			▲
	110302	0.2	3.6				▲
	110304	0.4	3.5				▲
	110308	0.8	3.2				▲

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIDIA Inserts

T Triangular type

11° Pos.

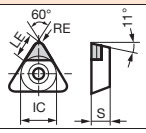
(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

TPGW 1603●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	4.4
	Thickness S	3.18		

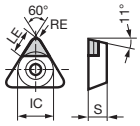
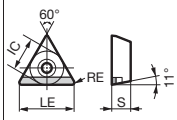
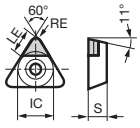
Applicable Internal Holders E42

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		NF-TPGW 160302	0.2	3.1	—	—	●	▲
		160304	0.4	2.9	—	—	●	▲
		160308	0.8	2.7	—	—	●	▲

TPGW 1604●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	4.4
	Thickness S	4.76		

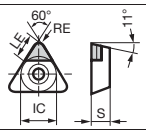
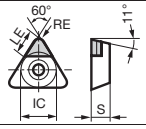
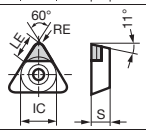
Applicable Internal Holders E14, E42 to E44

NF Insert		NF-TPGW 160401	0.1	3.1	—	—	●	▲
		160402	0.2	3.0	—	—	●	▲
		160404	0.4	2.9	—	—	●	▲
		160408	0.8	2.7	—	—	●	▲
NF Insert		NF-TPGW 160404P New	0.4	15.9	—	—	●	—
		160408P New	0.8	15.3	—	—	●	—
		TPGW 160402	0.2	3.7		●		
		160404	0.4	3.5		●		
		160408	0.8	3.3		●		
		160412	1.2	3.0				

TPM■ 1604●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	4.4
	Thickness S	4.76		

Applicable Internal Holders E14, E42 to E44

NF Insert		NF-TPMW 160402	0.2	2.5	●	—	—	—
		160404	0.4	2.4	●	—	—	—
		160408	0.8	2.1	●	—	—	—
BREAK MASTER		NF-TPMT 160402N-LD	0.2	3.1	—	—	●	—
		160404N-LD	0.4	2.9	—	—	●	—
		160408N-LD	0.8	2.7	—	—	●	—
BREAK MASTER		NF-TPMT 160402N-GD	0.2	3.1	—	—	●	—
		160404N-GD	0.4	2.9	—	—	●	—
		160408N-GD	0.8	2.7	—	—	●	—

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

11° Pos.

(Legend) General Cutting ●: 1st Recommendation

Recommended Application		DA90	DA150	DA1000	DA2200
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

Dimensions (mm)

TPGN 0902●●

Dimensions (mm)				
	Inscribed Circle IC	5.56	Hole Dia.	—
	Thickness S	2.38		

Applicable Cartridge: CP type

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-TPGN 090202	0.2	3.1	—	—	●	▲
	090204	0.4	3.0	—	—	●	▲
	090208	0.8	2.7	—	—	●	
	TPGN 090202	0.2	3.7		●		
	090204	0.4	3.6		●		
	090208	0.8	3.2				

TPGN 1103●●

Dimensions (mm)				
	Inscribed Circle IC	6.35	Hole Dia.	—
	Thickness S	3.18		

Applicable Internal Holders ☞E46

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-TPGN 110302	0.2	3.0	—	—	●	▲
	110304	0.4	2.9	—	—	●	▲
	110308	0.8	2.7	—	—	●	▲
NF Insert	NF-TPGN 110304P	0.4	10.4	—	—	●	▲
	110308P	0.8	9.8	—	—	●	▲
	TPGN 110300	0.05	3.8	—			
	110302	0.2	3.7		●		
	110304	0.4	3.6		●		
	110308	0.8	3.3		●		

Part number suffix P: Full-length Cutting Edge type

TPMR 1103●●

Dimensions (mm)				
	Inscribed Circle IC	6.35	Hole Dia.	—
	Thickness S	3.18		

Applicable Internal Holders ☞E46

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
BREAK MASTER (Left-handed)	NU-TPMR 110302R-DM	0.2	2.5	—		—	—
	110302L-DM	0.2	2.5	—	●	—	—
	110304R-DM	0.4	2.3	—		—	—
	110304L-DM	0.4	2.3	—	●	—	—

TPGN 1603●●

Dimensions (mm)				
	Inscribed Circle IC	9.525	Hole Dia.	—
	Thickness S	3.18		

Applicable External Holders ☞C36 to C37
Applicable Internal Holders ☞E46

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-TPGN 160302	0.2	3.0	—	—	●	▲
	160304	0.4	2.9	—	—	●	▲
	160308	0.8	2.7	—	—	●	▲
NF Insert	NF-TPGN 160304P	0.4	15.9	—	—	●	▲
	TPGN 160302	0.2	3.7		●		
	160304	0.4	3.5		●		
	160308	0.8	3.3		●		
	160312	1.2	3.0				

Part number suffix P: Full-length Cutting Edge type

TPMR 1603●●

Dimensions (mm)				
	Inscribed Circle IC	9.525	Hole Dia.	—
	Thickness S	3.18		

Applicable External Holders ☞C36 to C37
Applicable Internal Holders ☞E46

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
BREAK MASTER (Left-handed)	NU-TPMR 160302R-DM	0.2	2.5	—		—	—
	160302L-DM	0.2	2.5	—	●	—	—
	160304R-DM	0.4	2.3	—		—	—
	160304L-DM	0.4	2.3	—	●	—	—

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

T Triangular type

20° Pos.

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

TEGN 1102●●

Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	—
	Thickness S	2.38		

Applicable Cartridge: CE type

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-TEGN 110202	0.2	3.1	—	—	●	▲
	110204	0.4	2.9	—	—	●	▲
	TEGN 110202	0.2	3.7		●		
	110204	0.4	3.6		●		
	110208	0.8	3.3				

TEGN 1103●●

Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	—
	Thickness S	3.18		

Applicable Cartridge: CE type

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-TEGN 110302	0.2	3.1	—	—	●	▲
	110304	0.4	2.9	—	—	●	▲
	110308	0.8	2.7	—	—	●	▲
NF Insert	NF-TEGN 110304P	0.4	10.4	—	—	●	▲
	110308P	0.8	9.8	—	—	●	▲
	TEGN 110302	0.2	3.7		●		
	110304	0.4	3.6		●		
	110308	0.8	3.3				

Part number suffix P: Full-length Cutting Edge type

TEGN 1603●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	—
	Thickness S	3.18		

Applicable Cartridge: CE type

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-TEGN 160302	0.2	3.0	—	—	●	
	160304	0.4	2.9	—	—	●	
NF Insert	NF-TEGN 160304P	0.4	15.9	—	—	●	▲
	TEGN 160302	0.2	3.7		●		
	160304	0.4	3.6		●	●	▲
	160308	0.8	3.3				

Part number suffix P: Full-length Cutting Edge type

TEGN 2204●●

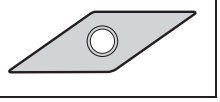
Dimensions (mm)	Inscribed Circle IC	12.70	Hole Dia.	—
	Thickness S	4.76		

Applicable Cartridge: CE type

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
	TEGN 220404	0.4	3.6		●		
	220408	0.8	3.3				

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

V 35° Diamond type



(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

Dimensions (mm) | SUMIDIA

Neg.

VNMA 1604●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	3.81
	Thickness S	4.76		

Applicable External Holders ☞C38 to C39

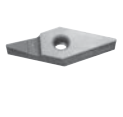
Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-VNMA160408	0.8	1.9	●	—	—	—
	160412	1.2	1.7	●	—	—	—

Neg.-Pos.

VNMX 1604●●

Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	3.81
	Thickness S	4.76		

Applicable External Holders ☞C38 to C39

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-VNMX 160402	0.2	6.9	—	—	●	▲
	160404	0.4	6.4	—	—	●	▲
	160408	0.8	5.6	—	—	●	▲
	160412	1.2	4.7	—	—	●	▲
One-Use	NU-VNMX 160402	0.2	3.6	—	—		▲
	160404	0.4	3.1	—	—		▲
	160408	0.8	2.3	—	—		▲
	160412	1.2	2.3	—	—		▲
	VNMX 160402	0.2	6.9		●	●	
	160404	0.4	6.4		●	●	▲
	160408	0.8	5.6		●	●	▲
	160412	1.2	4.7		●	●	▲

7° Pos.

VCMW 0802●●

Dimensions (mm)	Inscribed Circle IC	4.76	Hole Dia.	2.3
	Thickness S	2.38		

Applicable Internal Holders ☞E51, E54, E57, E60

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-VCMW 080202	0.2	3.2	●	—	—	—
	080204	0.4	2.8	●	—	—	—

VCM■ 1103●●

Dimensions (mm)	Inscribed Circle IC	6.35	Hole Dia.	2.8
	Thickness S	3.18		

Applicable External Holders ☞C40 to C41, D15, D20, D28
Applicable Internal Holders ☞E54, E57, E60

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-VCMW 110302	0.2	3.2	●	—	—	—
	110304	0.4	2.8	●	—	—	—
NF Insert	NF-VCMT 110301	0.1	3.5	—	—	●	▲
	110302	0.2	3.4	—	—	●	▲
	110304	0.4	3.0	—	—	●	▲
BREAK MASTER	NF-VCMT 110302N-LD	0.2	3.8	—	—	●	—
	110304N-LD	0.4	3.4	—	—	●	—
BREAK MASTER	NF-VCMT 110302N-GD	0.2	3.8	—	—	●	—
	110304N-GD	0.4	3.4	—	—	●	—

VCM■ 1604●●

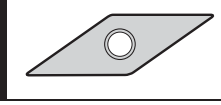
Dimensions (mm)	Inscribed Circle IC	9.525	Hole Dia.	4.4
	Thickness S	4.76		

Applicable External Holders ☞C40 to C41
Applicable Internal Holders ☞E54, E57

Shape	Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
NF Insert	NF-VCMW 160402	0.2	3.7	●	—	—	—
	160404	0.4	3.3	●	—	—	—
	160408	0.8	2.4	●	—	—	—
	160412	1.2	2.1	●	—	—	—
NF Insert	NF-VCMT 160404	0.4	6.5	—	—	●	▲
	160408	0.8	5.6	—	—	●	▲
	160412	1.2	4.6	—	—	●	▲

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

V 35° Diamond type



7° Pos.

VCMT 1604●●

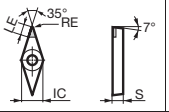
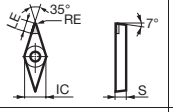
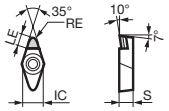
Dimensions (mm)				
	Inscribed Circle IC	9.525	Hole Dia.	4.4
	Thickness S	4.76		

Applicable External Holders ☞ C40 to C41

Applicable Internal Holders ☞ E54, E57

(Legend) General Cutting ●: 1st Recommendation

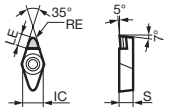
Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	SUMIDIA DA90	DA150	DA1000	DA2200
BREAK MASTER		NF-VCMT 160404N-LD	0.4	6.5	—	—	●	—
		160408N-LD	0.8	5.6	—	—	●	—
		160412N-LD	1.2	4.8	—	—	●	—
BREAK MASTER		NF-VCMT 160404N-GD	0.4	6.5	—	—	●	—
		160408N-GD	0.8	5.6	—	—	●	—
		160412N-GD	1.2	4.8	—	—	●	—
		VCMT 160408	0.8	5.8			●	▲
		160412	1.2	4.9			●	▲
		160412-WF	1.2	4.9			●	▲

VCMT 2205●●

Dimensions (mm)				
	Inscribed Circle IC	12.70	Hole Dia.	5.5
	Thickness S	5.56		

Applicable External Holders ☞ C45

Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	DA90	DA150	DA1000	DA2200
		VCMT 220520	2.0	5.0			●	▲
		220530	3.0	5.0			●	▲

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

W Trigon type

5° Pos.

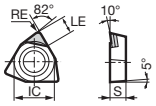
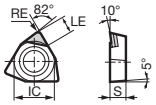
WBMT 0601●●

Dimensions (mm)				
	Inscribed Circle IC	3.97	Hole Dia.	2.2
	Thickness S	1.59		

Applicable Internal Holders ☞ E62

(Legend) General Cutting ●: 1st Recommendation

Recommended Application					
	N Non-Ferrous Metal			●	
	Carbide/Hard Brittle Material	●			

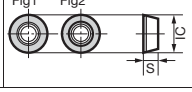
Shape		Cat. No.	Corner Radius RE	Cutting Edge Length LE	Dimensions (mm) SUMIDIA DA90	DA150	DA1000	DA2200
NF Insert		**NF-WBMT 060101L**	0.1	1.8	—	—	●	
		060102L	0.2	1.8	—	—	●	
		060104L	0.4	1.7	—	—	●	
		**WBMT 060101L**	0.1	1.8	—	—		▲
		060102L	0.2	1.8	—	—		▲
		060104L	0.4	1.7	—	—		▲

▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

For Turning

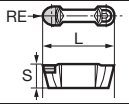
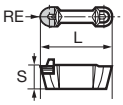
Round Insert

Dimensions (mm)

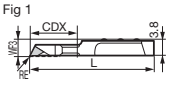
Shape		Cat. No.	SUMIDIA DA90	DA150	DA1000	DA2200	Inscribed Circle IC	Thickness S	Cutting Edge Length LE	Corner Radius RE	Hole Dia.	Fig	Applicable Holder
	Fig1 Fig2 	**RPGW 0803M0**			●	▲	8.0	3.18	—	—	3.3	1	Al. Wheel Turning Holder SEC-RP Profiling Holder (RP02 series (Made-to-order item))
		RPGT 0803M0-WF					8.0	3.18	—	—	3.3	2	

Part number suffix WF: Edge with Special Land for Aluminum Wheel Gloss Finishing

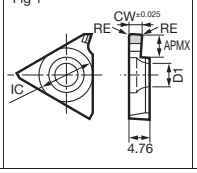
Dogbone Insert

Shape		Cat. No.	DA90	DA150	DA1000	DA2200	Overall Length L	Thickness S	Corner Radius RE			Fig	Applicable Holder
	Fig 1 	**MDE 3R**				●	26	8.5	3.0			1	Al. Wheel Turning Holder SEC-GD Profiling Holder (GDE series) →C46 to C47
		4R				●	30	8.5	4.0			1	
	Fig 1 	**MDE 3R-AW**				●	26	8.5	3.0			1	
		4R-AW				●	30	8.5	4.0			1	

Very Small Dia. Boring Insert

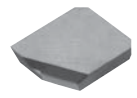
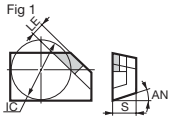
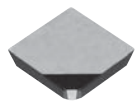
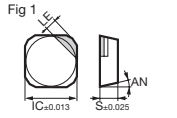
Shape		Cat. No.	DA2200	Min. Bore Dia. DMIN	WF3	Corner Radius RE	L	CDX	Fig	Applicable Holder
	Fig 1 	**KBMX R0311-10**	●	3.0	4.1	0.1	28.5	11.0	1	Very Small Dia. Boring Bar (CKB series) →M30
		R0411-10	●	4.0	4.3	0.1	28.5	11.0	1	
		R0511-10	●	5.0	4.5	0.1	28.5	11.0	1	

Grooving Insert

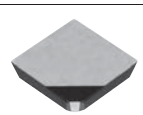
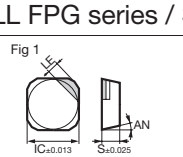
Shape		Cat. No.	DA2200 R	L	Inscribed Circle IC	Width of Cut CW	Corner Radius RE	Maximum Groove Depth APMX	Hole Dia. D1	Fig	Applicable Holder
	Fig 1 	**TGA R/L4125**	●		12.70	1.25	0.1	2.0	5.5	1	SEC-Grooving Tools (GWC series, GWCS series, GWCI series) →F4 to F5
		R/L4150	●		12.70	1.50	0.1	3.5	5.5	1	
		R/L4200	●		12.70	2.00	0.1	3.5	5.5	1	
		R/L4250	●		12.70	2.50	0.1	4.0	5.5	1	
		R/L4300	●		12.70	3.00	0.1	4.0	5.5	1	
		R/L4350	●		12.70	3.50	0.1	5.0	5.5	1	
		R/L4400	●		12.70	4.00	0.1	5.0	5.5	1	

For Milling

For SEC-ACE MILL APG series

Shape		Cat. No.	SUMIDIA DA150	DA1000	DA2200	Inscribed Circle IC	Thickness S	Cutting Edge Length LE	Relief Angle AN	Fig	Applicable Cutter/ Endmill
	Fig 1 	**APW 4R**		●	▲	12.70	3.18	2.0	15	1	APG series →H48
		5R				15.875	4.76	2.0	15	1	
	Fig 1 	**NF-SDC 42R**	—	●	▲	12.70	3.18	3.0	15	1	
		SDC 42R	●	●	▲	12.70	3.18	3.0	15	1	
		SDC 53R				15.88	4.76	3.0	15	1	

For SEC-ACE MILL FPG series / SEC-Multi Use Endmill FPE series

	Fig 1 	**NF-SDKN 42M**	—	●	▲	12.70	3.18	3.0	15	1	FPG series →H40 FPE series →H41
		SDKN 42M	●			12.70	3.18	3.0	15	1	
		SDKN 53M				15.88	4.76	3.0	15	1	

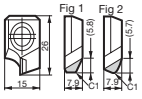
▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIDIA Inserts

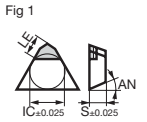
For Milling

Dimensions (mm)

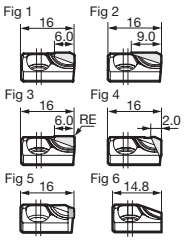
For SUMIDIA Cutter FAM series / SAM series

Shape		Cat. No.	SUMIDIA DA90	SUMIDIA DA150	SUMIDIA DA1000	SUMIDIA DA2200	SUMICRYSTAL SC10*1	SUMICRYSTAL SCV10*1	Inscribed Circle IC	Thickness S	Cutting Edge Length LE	Relief Angle AN	Fig	Applicable Cutter / Endmill
		**FAB R**	—	▲		▲	—	—	—	7.9	(5.8)	15	1	FAM series →M54
		L	—				—	—	—	7.9	(5.8)	15	1	
		SAB R	—	▲		▲	—	—	—	7.9	(5.7)	15	2	SAM series →M54 to M55
		L	—				—	—	—	7.9	(5.7)	15	2	

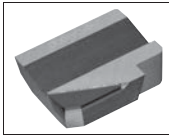
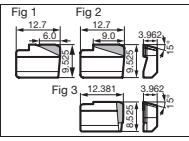
For SEC-ACE MILL CHG series / SEC-Multi Use Endmill CHE series

		**NF-TEEN 22R**	—	—	●	▲	—	—	6.35	3.18	4.9	20	1	CHG series →H156
		32R	—	—	●	▲	—	—	9.525	3.18	4.9	20	1	
		43R	—	—	●	▲	—	—	12.70	4.76	4.8	20	1	
		TEEN 22R	—	●		—	—	—	6.35	3.18	4.9	20	1	CHE series →H157 to H159
		32R	—	●		—	—	—	9.525	3.18	4.9	20	1	
		43R	—	●		—	—	—	12.70	4.76	4.8	20	1	

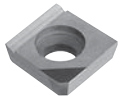
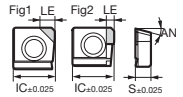
For High-efficiency Cutter for Aluminum Alloys ALNEX ANX series (Blade)

		**ANB 1600R-L**		—	●	—	—	—	—	—	6.0	—	1	ANX series →M32 to M42
		1600R-G		—	●	—	—	—	—	—	6.0	—	1	
		1600R-GB	●	—		—	—	—	—	—	6.0	—	1	
		1600R-H	—	—	●	—	—	—	—	—	6.0	—	1	
		ANB 1600R-GX		—	●	—	—	—	—	—	9.0	—	2	
		ANB 1604R		—	●	—	—	—	—	—	6.0	—	3	
		1608R		—	●	—	—	—	—	—	6.0	—	3	
		ANB 1600R-W		—	●	—	—	—	—	—	—	—	4	
		ANB 1600R-WS	—	—	—	—	—	●	—	—	—	—	5	
		ANBD	—	—	—	—	—	●*2	—	—	—	—	6	

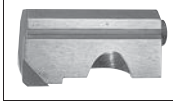
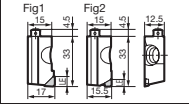
For High-efficiency Cutter for Aluminum Alloys HF series (Blade)

		**NF-LDEN 12T3ZDFR-L**		—	●	—	—	—	—	—	6.0	—	1	HF series →M44 to M49
		12T3ZDFR-G		—	●	—	—	—	—	—	6.0	—	1	
		12T3ZDTR-H		—	●	—	—	—	—	—	6.0	—	1	
		NF-LDEN 12T3ZDFR-GX		—	●	—	—	—	—	—	9.0	—	2	
		NF-LDEN 12T3ZDFR-W		—	●	—	—	—	—	—	—	—	3	

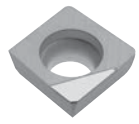
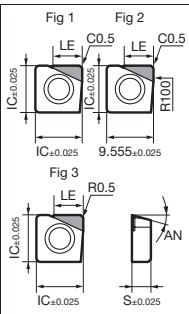
For High-Speed Cutter for Aluminum Alloys RF series (Insert)

		**NF-SNEW 1204ADFR**	—	—	●	▲	—	—	12.70	4.76	4.7	15	1	RF series →M50 to M51
		120404ADFR-H	—	—	●	—	—	—	12.70	4.76	9.5	15	1	
		NF-SNEW 1204ADFR-W	—	—	●	▲	—	—	12.70	4.76	2.3	15	2	
		SNEW 1204ADFR-WS	—	—	—	—	●	—	12.70	4.76	1.0	20	2	

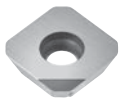
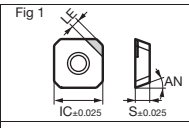
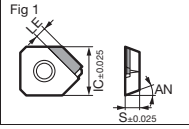
For High-Speed Cutter for Aluminum Alloys RF series (Blade)

		**RFB**	—	—		●	—	—	—	—	6.5	—	1	RF series →M50 to M51
		RFBW	—	—		●	—	—	—	—	4.5	—	2	

For Small Diameter Cutter for Aluminum Alloys SRF series

		**NF-SNEW 09T3ADTR**	—	—	●	▲	—	—	9.525	3.96	6.0	15	1	SRF series →M52 to M53
		NF-SNEW 09T3ADTR-U	—	—	●	▲	—	—	9.525	3.96	6.0	15	2	
		NF-SNEW 09T3ADTR-R	—	—	●	▲	—	—	9.525	3.96	6.0	15	3	

For SEC-WaveMill WGC series

		**NF-SECW13T3AGTN-N**	—	—	●	▲	—	—	13.40	3.97	2.1	20	1	WGC series →H26 to H28
		**NF-XEEW13T3AGFR-W**	—	—	●	▲	—	—	13.40	3.97	2.5	20	1	WGC series →H26 to H28

*1: SC10 is SUMICRYSTAL and SCV10 is CVD single-crystal diamond *2: Dummy blade for use with WS type (cemented carbide)

● mark: Standard stocked item (new product/expanded item) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SUMIDIA/SUMIDIA BINDERLESS Inserts

Indexable Inserts

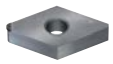
■ SUMIDIA BINDERLESS NPD10

Neg.

(Legend) Continuous Cutting ●: 1st Recommendation

Recommended Application: Carbide/Hard Brittle Material ●

Dimensions (mm)

Shape	Cat. No.	NPD10	Cutting Edge Length	Inscribed Circle IC	Thickness S	Hole Dia. D1	Corner Radius RE
	DNMA 150408RH	●	1.8	12.7	4.76	5.16	0.8
	150412RH	●	1.8	12.7	4.76	5.16	1.2
	SNMA 120408RH	●	1.7	12.7	4.76	5.16	0.8
	120412RH	●	1.7	12.7	4.76	5.16	1.2
	VNMA 160408RH	●	1.8	9.525	4.76	3.81	0.8
	160412RH	●	1.5	9.525	4.76	3.81	1.2

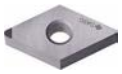
■ SUMIDIA DA90

Neg. NF

(Legend) General Cutting ●: 1st Recommendation

Recommended Application: N Non-Ferrous Metal; Carbide/Hard Brittle Material ◒

Dimensions (mm)

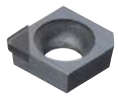
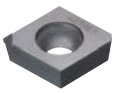
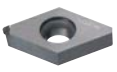
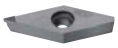
Shape	Cat. No.	DA90	Cutting Edge Length	Inscribed Circle IC	Thickness S	Hole Dia. D1	Corner Radius RE
	NF-DNMA 150408	●	2.0	12.7	4.76	5.16	0.8
	150412	●	2.0	12.7	4.76	5.16	1.2
	NF-SNMA 120408	●	2.4	12.7	4.76	5.16	0.8
	120412	●	2.4	12.7	4.76	5.16	1.2
	NF-VNMA 160408	●	1.9	9.525	4.76	3.81	0.8
	160412	●	1.7	9.525	4.76	3.81	1.2

Pos.

(Legend) Continuous Cutting ●: 1st Recommendation

Recommended Application: Carbide/Hard Brittle Material ●

Dimensions (mm)

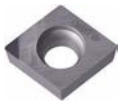
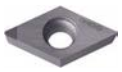
Shape	Relief Angle	Cat. No.	NPD10	Cutting Edge Length	Inscribed Circle IC	Thickness S	Hole Dia. D1	Corner Radius RE
	7°	CCMW 03X102RH	●	1.3	3.5	1.4	1.9	0.2
		03X104RH	●	1.3	3.5	1.4	1.9	0.4
		CCMW 04X102RH	●	1.7	4.3	1.8	2.3	0.2
		04X104RH	●	1.7	4.3	1.8	2.3	0.4
		CCMW 060202RH	●	1.7	6.35	2.38	2.8	0.2
		060204RH	●	1.7	6.35	2.38	2.8	0.4
		CCMW 09T302RH	●	1.7	9.525	3.97	4.4	0.2
		09T304RH	●	1.7	9.525	3.97	4.4	0.4
		09T308RH	●	1.6	9.525	3.97	4.4	0.8
	7°	DCMW 070202RH	●	2.1	6.35	2.38	2.8	0.2
		070204RH	●	2.0	6.35	2.38	2.8	0.4
		DCMW 11T302RH	●	2.1	9.525	3.97	4.4	0.2
		11T304RH	●	1.9	9.525	3.97	4.4	0.4
		11T308RH	●	1.6	9.525	3.97	4.4	0.8
	11°	TPMW 080202RH	●	1.2	4.76	2.38	2.3	0.2
		080204RH	●	1.0	4.76	2.38	2.3	0.4
		TPMW 110302RH	●	1.5	6.35	3.18	3.4	0.2
		110304RH	●	1.3	6.35	3.18	3.4	0.4
		110308RH	●	1.0	6.35	3.18	3.4	0.8
		TPMW 160402RH	●	2.2	9.525	4.76	4.4	0.2
		160404RH	●	2.0	9.525	4.76	4.4	0.4
		160408RH	●	1.6	9.525	4.76	4.4	0.8
	7°	VCMW 080201RH	●	2.2	4.76	2.38	2.3	0.1
		080202RH	●	1.9	4.76	2.38	2.3	0.2
		080204RH	●	1.5	4.76	2.38	2.3	0.4
		VCMW 110302RH	●	2.1	6.35	3.18	2.8	0.2
		110304RH	●	1.7	6.35	3.18	2.8	0.4
		VCMW 160402RH	●	2.1	9.525	4.76	4.4	0.2
		160404RH	●	1.7	9.525	4.76	4.4	0.4
		160408RH	●	1.8	9.525	4.76	4.4	0.8
		160412RH	●	1.5	9.525	4.76	4.4	1.2

Pos. NF

(Legend) General Cutting ●: 1st Recommendation

Recommended Application: N Non-Ferrous Metal; Carbide/Hard Brittle Material ◒

Dimensions (mm)

Shape	Relief Angle	Cat. No.	DA90	Cutting Edge Length	Inscribed Circle IC	Thickness S	Hole Dia. D1	Corner Radius RE
	7°	NF-CCMW 03X102	●	1.1	3.5	1.4	1.9	0.2
		03X104	●	1.1	3.5	1.4	1.9	0.4
		NF-CCMW 04X102	●	1.5	4.3	1.8	2.3	0.2
		04X104	●	1.5	4.3	1.8	2.3	0.4
		NF-CCMW 060202	●	2.4	6.35	2.38	2.8	0.2
		060204	●	2.4	6.35	2.38	2.8	0.4
		NF-CCMW 09T302	●	2.4	9.525	3.97	4.4	0.2
		09T304	●	2.4	9.525	3.97	4.4	0.4
		09T308	●	2.3	9.525	3.97	4.4	0.8
	7°	NF-DCMW 070202	●	2.6	6.35	2.38	2.8	0.2
		070204	●	2.4	6.35	2.38	2.8	0.4
		NF-DCMW 11T302	●	2.6	9.525	3.97	4.4	0.2
		11T304	●	2.4	9.525	3.97	4.4	0.4
		11T308	●	2.0	9.525	3.97	4.4	0.8
	11°	NF-TPMW 080202	●	2.5	4.76	2.38	2.3	0.2
		080204	●	2.4	4.76	2.38	2.3	0.4
		NF-TPMW 110302	●	2.5	6.35	3.18	3.4	0.2
		110304	●	2.4	6.35	3.18	3.4	0.4
		110308	●	2.1	6.35	3.18	3.4	0.8
		NF-TPMW 160402	●	2.5	9.525	4.76	4.4	0.2
		160404	●	2.4	9.525	4.76	4.4	0.4
		160408	●	2.1	9.525	4.76	4.4	0.8
	7°	NF-VCMW 080202	●	3.2	4.76	2.38	2.3	0.2
		080204	●	2.8	4.76	2.38	2.3	0.4
		NF-VCMW 110302	●	3.2	6.35	3.18	2.8	0.2
		110304	●	2.8	6.35	3.18	2.8	0.4
		NF-VCMW 160402	●	3.7	9.525	4.76	4.4	0.2
		160404	●	3.3	9.525	4.76	4.4	0.4
		160408	●	2.4	9.525	4.76	4.4	0.8
		160412	●	2.1	9.525	4.76	4.4	1.2

The R portion of the cutting edge is cylindrical shaped.

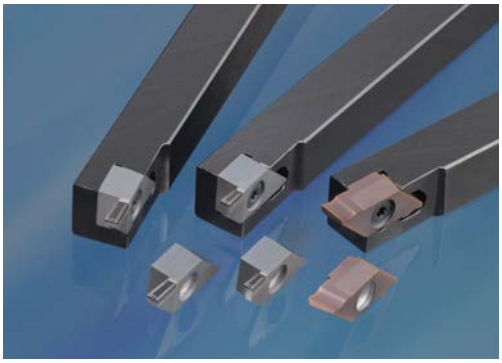
Page for Applicable Holders

Cat. No.	Applicable Holder	Cat. No.	Applicable Holder	Cat. No.	Applicable Holder
(NF-) DNMA1504●●(RH)	C14 to C16 E15,E31 to E33	(NF-) CCMW03X1●●(RH)	E18,E20	(NF-) TPMW0802●●(RH)	E42 to E45
(NF-) SNMA1204●●(RH)	C21 to C26 E39 to E41	(NF-) CCMW04X1●●(RH)	E18,E20	(NF-) TPMW1103●●(RH)	E14,E42 to E46
(NF-) VNMA1604●●(RH)	C38 to C39	(NF-) CCMW0602●●(RH)	C13,D13,D17,D22,D23 E18 to E20	(NF-) TPMW1604●●(RH)	E14,E42 to E44
		(NF-) CCMW09T3●●(RH)	C13,D13,D17,D22,D23 E12,E18 to E20	(NF-) VCMW0802●●(RH)	E51,E54,E57,E60
		(NF-) DCMW0702●●(RH)	C19,D14,D18,D19,D24,D25 E16,E26 to E30	(NF-) VCMW1103●●(RH)	E54,E57,E60
		(NF-) DCMW11T3●●(RH)	C19,D14,D18,D19,D24,D25 E26 to E30	(NF-) VCMW1604●●(RH)	E54,E57

: External Turning : Internal Boring

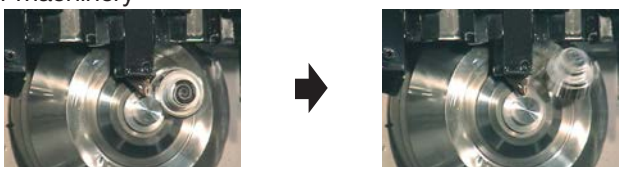
SGW series

VIDEO OF CUTTING



■ Features

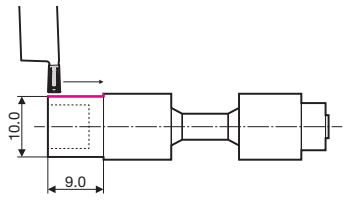
- Enables high-efficiency roughing of long parts
- Coin-shaped chips are less likely to tangle with work material or machinery



■ SUMIDIA Multi-Function Tool with Chipbreaker SUMIDIA BREAK MASTER LD type

- Provides excellent chip control in traverse cutting and grooving of aluminum alloy.
- Solves chip control problems and dramatically improves work efficiency.
- Achieves long, stable tool life by employing high-toughness grade SUMIDIA DA1000.

■ Application Examples



Work Material: Valve (A6061) Tool Cat. No.: KGV R2004-LD (DA1000)
Cutting Conditions: vc = 250m/min, f = 0.10mm/rev, ap = 0.5mm Wet

SGW
External Turning

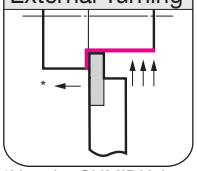
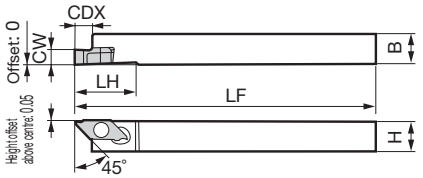
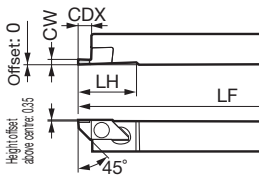


Fig 1



Dimensions with SUMIDIA insert mounted



External Multi-purpose type (Grooving/Traverse Cutting) Screw-on

*Use the SUMIDIA insert for traverse cutting.

Holder

Parts

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length LF	Maximum Groove Depth CDX	Head Length LH	Fig	Flat Insert Screw		Wrench
									N·m	(For Torx hole)
SGW R1212	●	12	12	120	7.0	24.5	1	BFTX0410T8R	**1.1**	TRX08
SGW R1616	●	16	16	120	7.0	24.5	1			

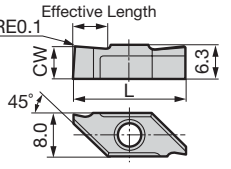
The above dimensions for LF, CDX and LH are values with a carbide insert mounted. (Refer to the table below for dimensions with SUMIDIA insert mounted)

Insert (Carbide) (Coated Carbide)

Dimensions (mm)

Cat. No.	AC1030U	AC530U	Width of Cut CW	Overall Length L	Overall Length LF	Maximum Groove Depth CDX	Head Length LH	Effective Length	Fig
KGV R400	●	●	4.0	21.0	120	7.0	24.5	6.3	1
KGV R500	●	●	5.0	21.0	120	7.0	24.5	6.3	1
KGV R600	●	●	6.0	21.0	120	7.0	24.5	6.3	1

Fig 1

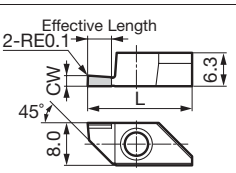


Insert (SUMIDIA) (SUMIDIA)

Dimensions (mm)

Cat. No.	DA1000	Width of Cut CW	Overall Length L	Overall Length LF	Maximum Groove Depth CDX	Head Length LH	Effective Length	Fig
KGV R2004-LD	●	2.0	19.7	118.7	5.0	23.2	4.0	1
KGV R2504-LD	●	2.5	19.7	118.7	5.0	23.2	4.0	1
KGV R2506-LD	●	2.5	21.2	120.2	6.5	24.7	5.5	1

Fig 1



The above dimensions for LF, CDX and LH are the holder dimensions with insert mounted.

Note: The values in red (maximum groove depth CDX) have been changed from those in the 2021-2022 General Catalogue.

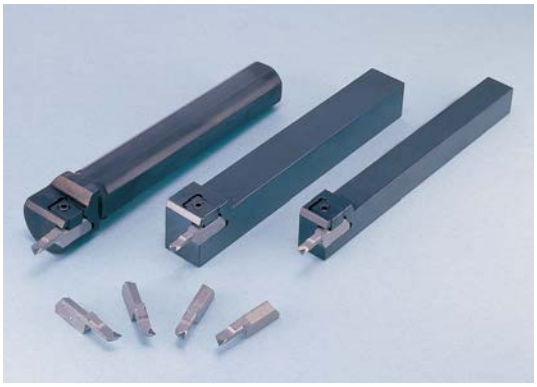
Recommended Cutting Conditions

Work Material	P Steel M Stainless Steel N Non-Ferrous Metal	N Non-Ferrous Metal	
Insert Grades	AC1030U	DA1000	
Machining Details	Grooving	Grooving	Traverse Cutting
Spindle Speed n (min-1)	4,000 to 6,000	4,500 to 8,000	4,500 to 8,000
Feed Rate f (mm/rev)	0.05 to 0.15	0.07 to 0.15	0.07 to 0.15
Coolant	Wet (oil-based)		

Be careful with spindle power during use. For small lathes, insufficient spindle power during machining may cause the machine to stop.
Be careful when machining carbon steel and stainless steel in particular.

N·m Recommended tightening torque (N·m) Note: Regrinding the SUMIDIA BREAK MASTER LD type will adversely affect chip evacuation performance.

CKB series

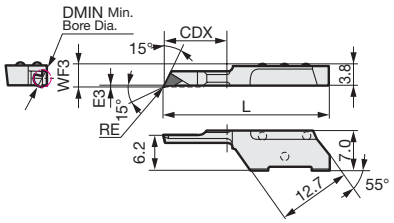


SumiSmall

■ Features

- High indexing accuracy with simple structure design and one-touch clamping.
- Utilises DA2200 grade with excellent edge sharpness.

■ Insert



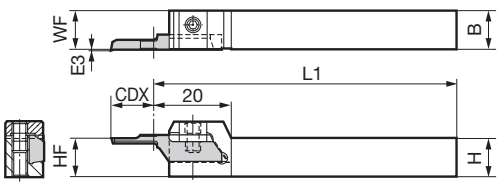
(SUMIDIA)

Dimensions (mm)

Cat. No.	DA2200	Min. Bore Dia. DMIN	Cutting Edge Position WF3	Offset E3	Corner Radius RE	Overall Length L	Depth of Cut CDX
KBMX R0311-10	●	**3.0**	4.1	0.3	0.1	28.5	11
KBMX R0411-10	●	**4.0**	4.3	0.5	0.1	28.5	11
KBMX R0511-10	●	**5.0**	4.5	0.7	0.1	28.5	11

■ Square Shank

Fig 1



For E3 and CDX, refer to the insert section

Holder

Dimensions (mm)

Cat. No.	Stock	Height H	Width B	Overall Length L1	Cutting Edge Distance WF	Cutting Edge Height HF	Fig	Parts: Clamp Plate	Parts: Double Screw	Parts: Wrench
CKB R1010-16	●	10	10	100	10	10	1	CKBW16	WB4-8	LH020
CKB R1212-16	●	12	12	125	12	12	1			
CKB R1616-16	●	16	16	125	16	16	1			
CKB R2020-16	●	20	20	125	20	20	1			
CKB R2525-16		25	25	150	25	25	1			

*Inserts are not included in the tool holders

■ Round Shank

Fig 1

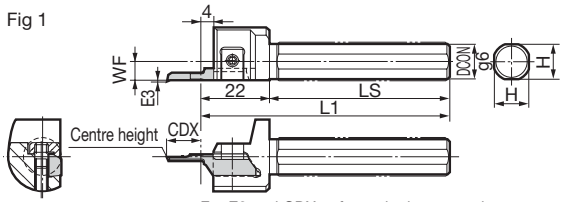
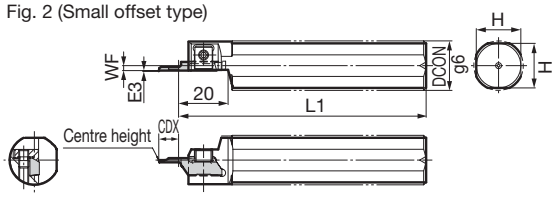


Fig. 2 (Small offset type)



For E3 and CDX, refer to the insert section

Holder

Dimensions (mm)

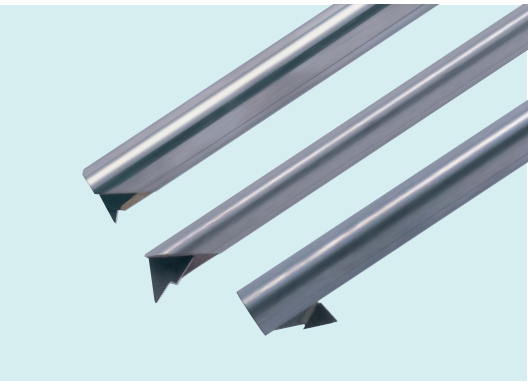
Cat. No.	Stock	Diameter DCON	Height H	Overall Length L1	Length LS	Cutting Edge Distance WF	Fig	Parts: Clamp Plate	Parts: Double Screw	Parts: Wrench (For Hexagonal hole)
S10F-CKB R-16	●	10	9	80	58	5	1	CKBW16	WB4-8	LH020
S12F-CKB R-16	●	12	11	80	58	6	1			
S16H-CKB R-16	●	16	15	100	78	8	1			
S19K-CKB R-16	●	19.05	17	125	103	8	1			
S20K-CKB R-16	●	20	18	125	103	10	1			
S1905H-CKB RS-16	●	19.05	17	100	—	2	2			
S20H-CKB RS-16	●	20	18	100	—	2	2			
S22K-CKB RS-16	●	22	19	125	—	2	2			
S25K-CKB RS-16	●	25	23	125	—	2	2			
S254K-CKB RS-16	●	25.4	23	125	—	2	2			

*Inserts are not included in the tool holders

■ Recommended Cutting Conditions

Work Material	Spindle Speed	Depth of Cut ap	Feed Rate f	Coolant
N Aluminum Alloy	Above 2,000 min^{-1}	0.1mm or below	0.1mm/rev or below	Wet

DABB series



■ Features

SumiSmall

- Small Diameter Boring Bars for Aluminum Alloy
  Three types are in stock, enabling a range of machining from general boring to necking and back turning. ø3.0mm minimum machining diameter
- Utilises High Strength PCD Grade DA2200 for Cutting Edge

For general boring with min. bore diameter ø10 to ø22mm range, use the BNB series small diameter boring bar + SUMIDIA Insert (See page L126 for details)

PCD

DABB-C

Stop-Boring, Through-Boring and Back Chamfering

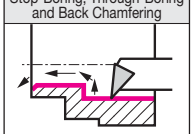
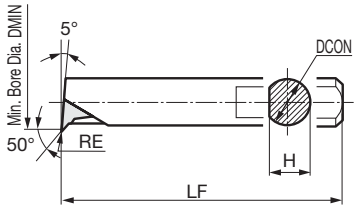


Fig 1



SumiSmall

Holder (SUMIDIA)

Dimensions (mm)

Cat. No.	DA2200	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Corner Radius RE	Applicable Sleeve	Fig
DABB 025CR	●	**3.0**	2.5	2.2	60	0.1	HBB 2516	1
DABB 035CR	●	**4.0**	3.5	3.2	60	0.1	HBB 3516	1
DABB 045CR	●	**5.0**	4.5	4.1	80	0.1	HBB 4516	1
DABB 060CR	●	**7.0**	6.0	5.2	80	0.1	HBB 616	1

PCD

DABB-N

Stop-Boring, Through-Boring and Necking

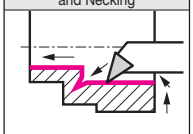
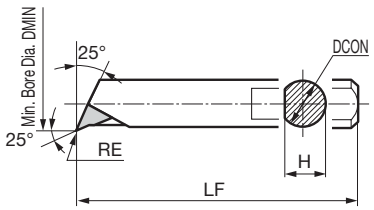


Fig 1



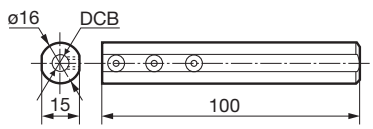
SumiSmall

Holder (SUMIDIA)

Dimensions (mm)

Cat. No.	DA2200	Min. Bore Dia. DMIN	Diameter DCON	Height H	Overall Length LF	Corner Radius RE	Applicable Sleeve	Fig
DABB 025NR	●	**3.0**	2.5	2.2	60	0.1	HBB 2516	1
DABB 035NR	●	**4.0**	3.5	3.2	60	0.1	HBB 3516	1
DABB 045NR	●	**5.0**	4.5	4.1	80	0.1	HBB 4516	1
DABB 060NR	●	**7.0**	6.0	5.2	80	0.1	HBB 616	1

Fig 1



Sleeve

Dimensions (mm)

Cat. No.	Stock	Bore Dia. DCB	Fig	Set Screw	Wrench
					(For Hexagonal hole)
HBB 2516	●	2.5	1	BT0404	LH020
HBB 3516	●	3.5	1		
HBB 4516	●	4.5	1		
HBB 616	●	6.0	1		

HBX type sleeve can also be used.

■ Recommended Cutting Conditions

Work Material	Spindle Speed	Depth of Cut ap	Feed Rate f	Coolant
N Aluminum Alloy	Above 2,000 min^{-1}	0.1mm or below	0.1mm/rev or below	Wet

ALNEX ANX series

VIDEO OF CUTTING

■ Features

- **Drastically Reduced Runout Adjustment Time**
  Simple screw-fastening structure enables fine adjustments to be made easily
- **Through-Blade Coolant**
  Ensures coolant supply to the cutting edge and breaks chips
- **Lightweight Aluminum Alloy Body (ANXA type)**
  Utilises aluminum alloy to achieve a total weight of less than 1.3kg for a ø125mm cutter with 22 teeth
- **Introducing the High-strength CVD Single Crystal Diamond SCV10 Wiper Blade WS type**

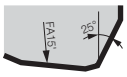
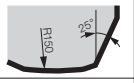
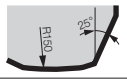
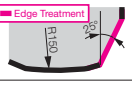
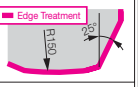
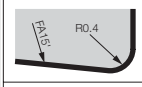
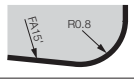
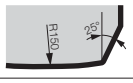
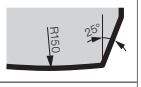
■ Product Range

Type	Cat. No.	Body Material	Max. Diameter (mm) ø25	ø30	ø32	ø40	ø50	ø63	ø80	ø100	ø125	ø160
Shell	ANXA 16000R (Inch)	Aluminum Alloy							6 10 14	8 12 18	10 14 22	12 20 28
	ANXA 16000RS	Aluminum Alloy							6 10 14	8 12 18	10 14 22	12 20 28
	ANXS 16000R (Inch)	Steel						6 8 12	6 10 14	8 12 18	10 14 22	
	ANXS 16000RS	Steel				4 6	4 6 9	6 8 12	6 10 14	8 12 18	10 14 22	
Shank	ANXS 16000E	Steel	2	3 4	3 4	4 6	4 6 9					
Modular	ANXS 16000M	Steel	2	3 4	3 4	4 6						

Number in ●●● shows the number of teeth (Inch) Inch Bore

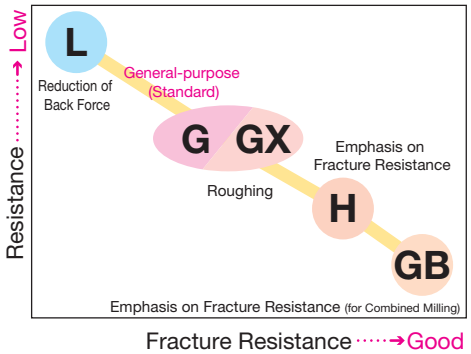
Modular type ☞M42

■ Blade Selection Guide

Work Material	N								
Applications	Finishing/ Light Cutting	General-purpose	Roughing		Composite Milling *1	Corner Radius Milling	Corner Radius Milling	Finishing	Burr-free Mirror Finish
Features	Low Cutting Force	Standard	Long Edge	High Strength	High Strength	Corner Radius 0.4	Corner Radius 0.8	Wiper	Wiper
Cutting Edge Shape	L	G	GX	H	GB	—	—	W	WS
									
Edge Length (*2)	6.0mm	6.0mm	9.0mm	6.0mm	6.0mm	6.0mm	6.0mm	2.0mm	1.0mm

*1 Machining of components combining aluminum alloy and cast iron. W type and WS type cannot be used together.

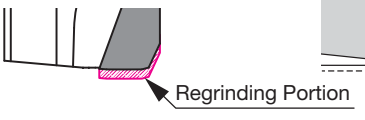
■ Blade Selection Reference

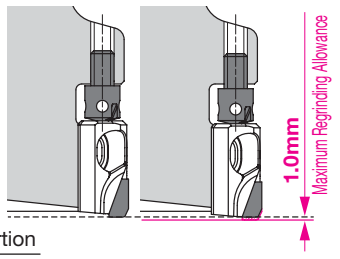


*2 Edge length

● Regrinding possible up to 1.0mm. Reduced running costs

Assuming 0.2mm of regrinding each time, an edge can be used up to 6 times.
(Peripheral cutting edge and WS type cannot be reground.)



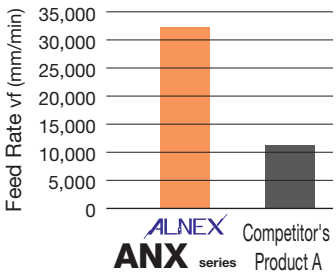


■ High-speed/High-efficiency Cutting

Realises ultra-high-efficiency machining with vf = 30,000mm/min

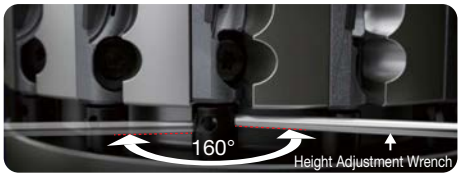
Cutter diameter ø100mm comparison

	Spindle Speed min⁻¹	Number of Teeth	Feed Rate vf(mm/min)
ALNEX ANX series	18,000	18	32,400
Competitor's Product A	9,500	12	11,400

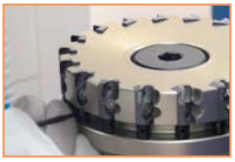


■ Drastically Reduced Runout Adjustment Time

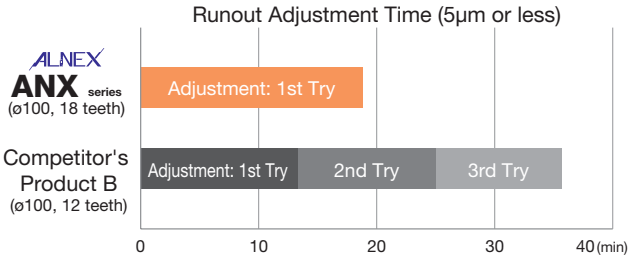
● Simple screw-fastening structure ● Enables fine adjustments to be made easily ● High-rigidity body (reduces deformation due to tightening)



Adjustment is easy thanks to the large movable range of the height adjustment wrench.



We recommend keeping cutting edge height variation during runout adjustment to within 5μm.

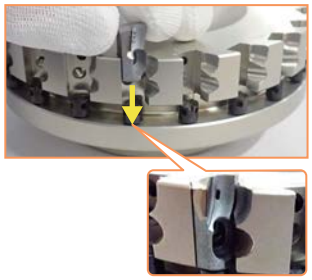


Completed on 1st Try, Adjustment Time Reduced

* Because the cutting edge chips off easily, care is required when mounting on the cutter body. Use a non-contact tool presetter.

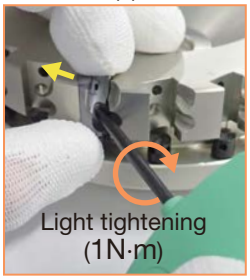
■ Blade Mounting/Runout Adjustment

(1)



(1) Slide the blade into the cutter teeth groove.

(2)



(2) Lightly tighten the cap screw while pressing the blade against the restraining face. (1N·m)

(3)

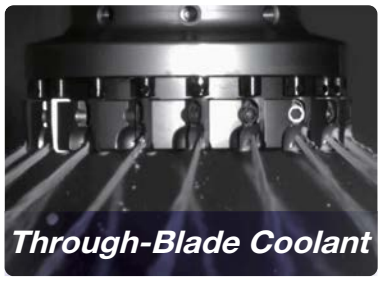
(3) Adjust the blade to the required height by using the dedicated wrench to turn the height adjustment screw.

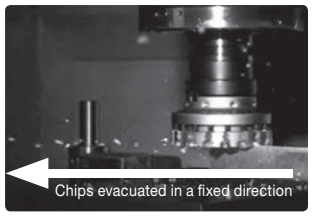
(4)

(4) Perform final tightening of the cap screw. (2N·m)

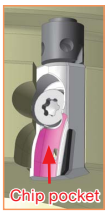
■ Chip Control

Through-Blade Coolant chip breaking





Controls the chips' scatter direction.



ALNEX ANX series

Competitor's Product C

The chip pocket catches the chips and suppresses damage to the body.

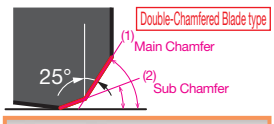
Work Material: ADC12 Cutting Conditions: vc = 2,500m/min, fz = 0.05mm/t, ap = 0.5mm, Wet

■ Burr Control

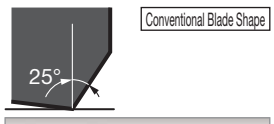
Reduces burrs by using a double-chamfered cutting edge (L/G/GX/H/GB type)

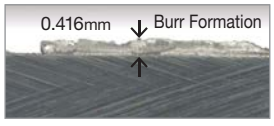
Drastically reduces burrs by preventing plastic deformation that causes burrs.

Work Material: A6061 Rolled Steel
Cutting Conditions: vc = 3,142m/min,
fz = 0.10mm/t, ap = 0.5mm Dry



ALNEX ANX series

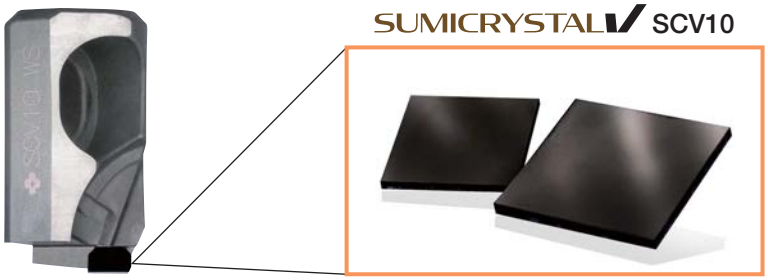




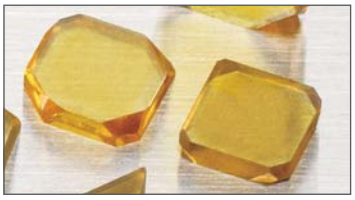
Conventional Tool

New CVD Single Crystal Diamond SCV10 Wiper Blade WS type

- Wiper blade adopts high-strength single-crystal diamond using Sumitomo Electric Hardmetal's vapour phase synthesis technology
- Sharp cutting edge achieves burr-free mirror finish in aluminum alloy machining
- Superior wear resistance maintains cutting edge sharpness for a long time, reducing total tool costs



Conventional single-crystal diamond

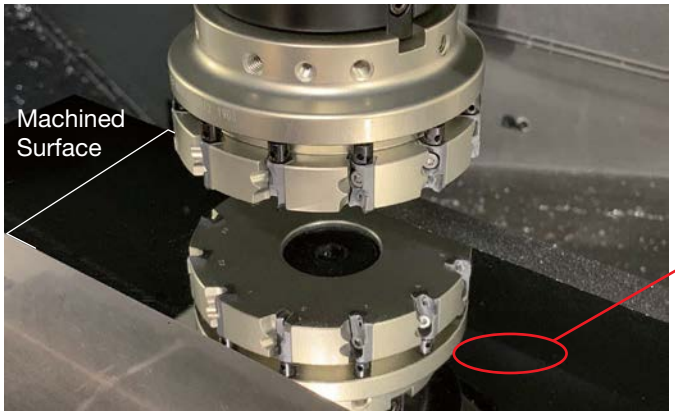


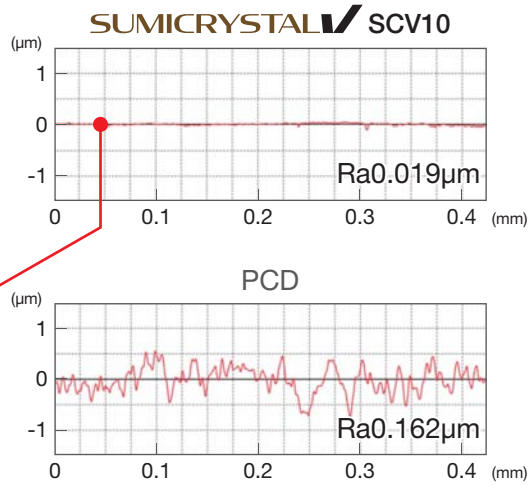
◆ Superb mirror surface and burr control through sharp cutting edge

Realizes a mirror finish in milling of aluminum alloys, copper alloys, and other non-ferrous metals, with long-term burr control

■ Mirror Finish (Wiper Blade WS type)

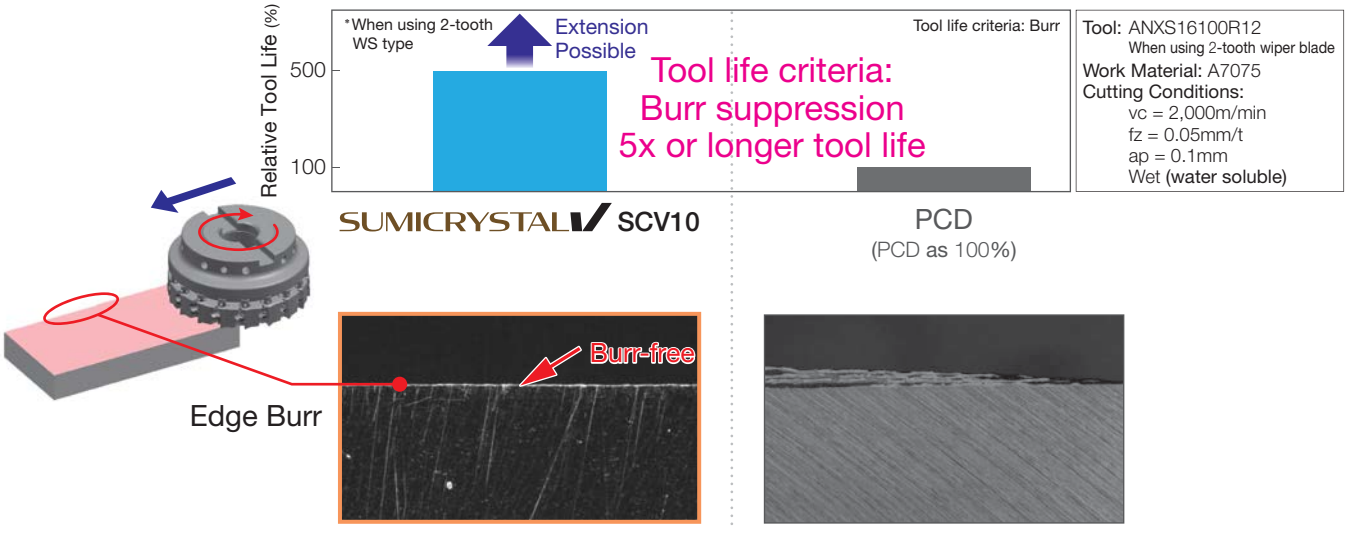
Sharp cutting edge achieves mirror finish with cutting alone





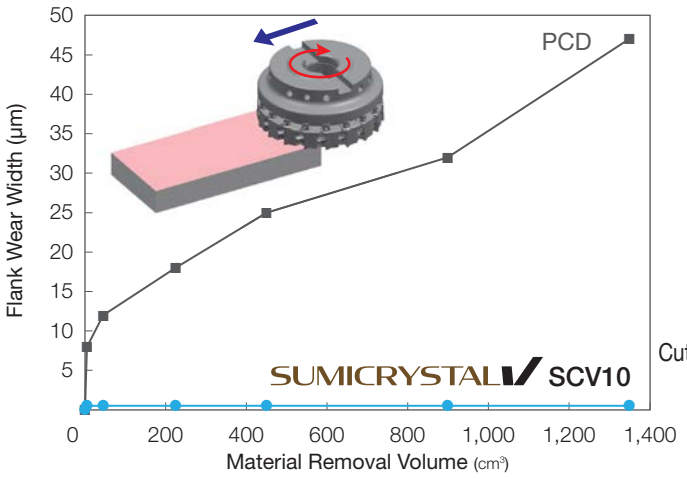
■ Burr-Free (Wiper Blade WS type)

Sharp cutting edge and excellent wear resistance suppress burrs over a long period



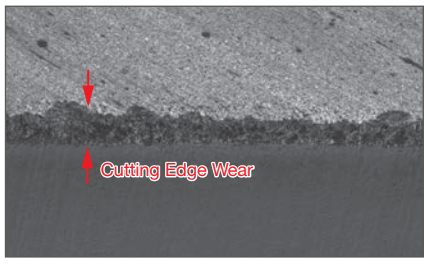
◆ Superior wear resistance maintains cutting edge sharpness for a long time

Wear resistance evaluation in high-silicon aluminum alloy machining



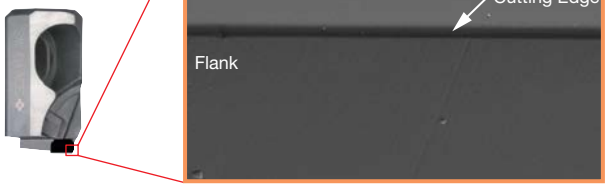
Work Material: Al-17wt.% Si alloy
Cutting Conditions: vc = 800m/min, fz = 1.0mm/t, ap = 0.03mm
Wet (water soluble)
*Evaluation with 1-tooth wiper blade
(dummy blade used in opposite position)

PCD



SUMICRYSTAL SCV10

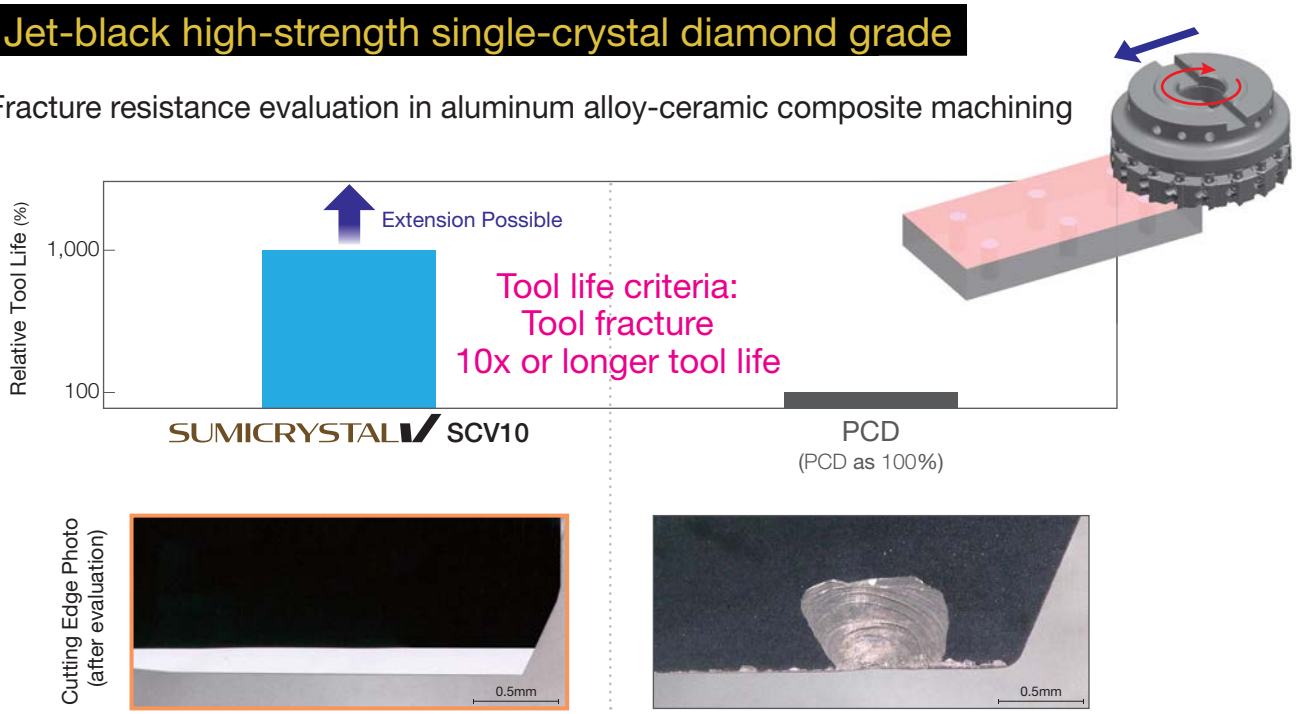
Cutting Edge Photo
(After use)



Long-term mirror finish with burrs suppressed and no flank wear progress

◆ Jet-black high-strength single-crystal diamond grade

Fracture resistance evaluation in aluminum alloy-ceramic composite machining



Work Material: Aluminum Alloy + Ceramic Composite
Cutting Conditions: vc = 2,500m/min, fz = 1.0mm/t, ap = 0.03mm
Wet (water soluble)
*Evaluation with 1-tooth wiper blade (dummy blade used in opposite position)

10x or more fracture resistance compared to PCD in finishing at low depth of cut (0.05 mm or less)

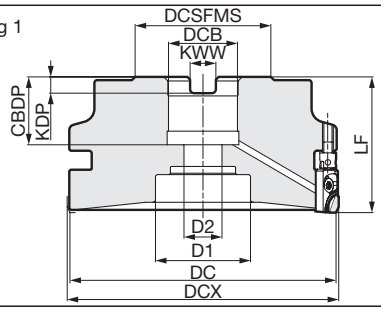
ANXA 16000R(S) type

Rake Angle		
Radial	+5°	
Axial	+5°	

3mm 90°

Face Milling | Shoulder Milling | Groove Milling

Fig 1



Body (Aluminum Alloy)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss Dia. DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**ANXA 16080RS06**	●	**80**	78	50	50	**27**	12.4	7	22	35	14	6	0.5	1
	16080RS10	●	**80**	78	50	50	**27**	12.4	7	22	35	14	10	0.5	1
	16080RS14	●	**80**	78	50	50	**27**	12.4	7	22	35	14	14	0.5	1
	16100RS08	●	**100**	98	50	50	**27**	12.4	7	22	35	14	8	0.8	1
	16100RS12	●	**100**	98	50	50	**27**	12.4	7	22	35	14	12	0.8	1
	16100RS18	●	**100**	98	50	50	**27**	12.4	7	22	35	14	18	0.8	1
	16125RS10	●	**125**	123	50	50	**27**	12.4	7	22	35	14	10	1.2	1
	16125RS14	●	**125**	123	50	50	**27**	12.4	7	22	35	14	14	1.2	1
	16125RS22	●	**125**	123	50	50	**27**	12.4	7	22	35	14	22	1.3	1
	16160RS12	●	**160**	158	80	63	**40**	16.4	9	29	52	29	12	2.6	1
	16160RS20	●	**160**	158	80	63	**40**	16.4	9	29	52	29	20	2.6	1
	16160RS28	●	**160**	158	80	63	**40**	16.4	9	29	52	29	28	2.6	1
Inch	**ANXA 16080R06**	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	6	0.5	1
	16080R10	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	10	0.5	1
	16080R14	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	14	0.5	1
	16100R08	●	**100**	98	50	50	**25.4**	9.5	6	25	35	14	8	0.8	1
	16100R12	●	**100**	98	50	50	**25.4**	9.5	6	25	35	14	12	0.9	1
	16100R18	●	**100**	98	50	50	**25.4**	9.5	6	25	35	14	18	0.9	1
	16125R10	●	**125**	123	50	50	**25.4**	9.5	6	25	35	14	10	1.2	1
	16125R14	●	**125**	123	50	50	**25.4**	9.5	6	25	35	14	14	1.2	1
	16125R22	●	**125**	123	50	50	**25.4**	9.5	6	25	35	14	22	1.3	1
	16160R12	●	**160**	158	80	63	**38.1**	15.9	10	35.5	55	30	12	2.3	1
	16160R20	●	**160**	158	80	63	**38.1**	15.9	10	35.5	55	30	20	2.4	1
	16160R28	●	**160**	158	80	63	**38.1**	15.9	10	35.5	55	30	28	2.6	1

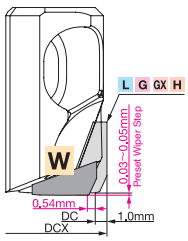
Blades are sold separately.
If using blades with corner radius (ANB1604R/ANB1608R), DC = DCX.
Weight indicated includes the weight with blades and other spare parts (excluding the centre bolt).
All aluminum alloy cutter bodies from (DCX) ø80 to ø125 have similar bore diameter (DCB) (metric ø27/inch ø25.4).
Note: The values in red have been changed from Rev. 3 and the 2021-2022 General Catalogue.

Identification Code

ANX	A	16	100	R	S	18
Series Code	Aluminum Alloy Body	Blade Size	Max. Dia.	Feed Direction	Metric Bore	Number of Teeth

■ Precautions when Using Wiper Blades

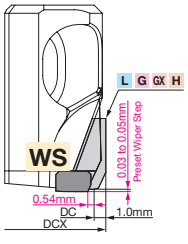
· W type Setting



⚠ Precautions

In order to maintain cutter balance when using the W type wiper blade, use a cutter with an even-number of cutting teeth and place another W type wiper blade at the opposite teeth position.

· WS type Setting



⚠ Precautions

(For more details, refer to the instruction manual included with the product)

In order to maintain cutter balance when using the WS type (SCV10 wiper blade), use a cutter with an even-number of cutting teeth and place another WS type wiper blade (or dummy blade ANBD) at opposite teeth positions.

*The dummy blade is dedicated for use with WS type.

ANXA 16000R(S) type

Expansion

Blade

Dimensions (mm)

Grade Classification		SUMIDIA		SUMICRYSTAL V
Process	High-speed/Light Cutting	N	KN	N
	General-purpose	N	KN	
	Roughing	N	KN	

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	Corner Radius RE	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●		—	6.0	—	Linear	Low Cutting Force	1
ANB 1600R-G	●		—	6.0	—	Arc-Shaped	General-purpose	1
ANB 1600R-GB		●	—	6.0	—	Arc-Shaped	Composite Milling*1	1
ANB 1600R-H	●	—	—	6.0	—	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●		—	9.0	—	Arc-Shaped	Long Edge	2
ANB 1604R	●		—	6.0	0.4	Linear	Corner Radius	3
ANB 1608R	●		—	6.0	0.8	Linear	Corner Radius	3
ANB 1600R-W	●		—	—	—	Arc-Shaped	Wiper	4
ANB 1600R-WS	—	—	●	—	—	Arc-Shaped	Wiper	5
ANBD	—	—	●*2	—	—	—	Dummy Blade	6

Fig 1

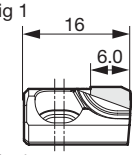


Fig 2

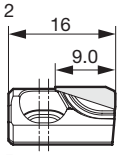


Fig 3

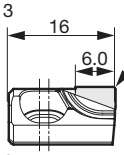
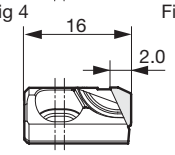
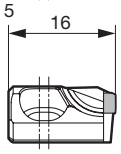


Fig 4



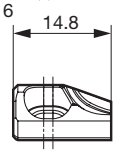
Wiper Blade

Fig 5



Wiper Blade

Fig 6



Dummy Blade

*1 Cast iron/aluminum alloy *2 Dummy blade for use with WS type (cemented carbide), refer to M36 "Precautions when Using Wiper Blades" (Mounting Precautions).

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000 SCV10

Si content of over 12.6%

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000 DA90 SCV10

Combined Milling of Cast Iron/Aluminum Alloy

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
K N	Cast Iron/ Aluminum Alloy	—	300 - **400** - 500	0.05 - **0.13** - 0.20	DA90

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
For combined milling of cast iron/aluminum alloy, we recommend DA90.
When using wiper blade WS type, see the table below.

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXA 16080RS06	20,000
16080RS10	20,000
16080RS14	20,000
16100RS08	18,000
16100RS12	18,000
16100RS18	18,000
16125RS10	16,000
16125RS14	16,000
16125RS22	16,000
16160RS12	14,000
16160RS20	14,000
16160RS28	14,000
ANXA 16080R06	20,000
16080R10	20,000
16080R14	20,000
16100R08	18,000
16100R12	18,000
16100R18	18,000
16125R10	16,000
16125R14	16,000
16125R22	16,000
16160R12	14,000
16160R20	14,000
16160R28	14,000

*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

Parts

Applicable Cutter	Cap Screw		Wrench	Adjustment Screw	Adjustment Wrench	Centre Bolt	
		N·m					N·m
ANXA 16080R(S)○○	BXA0310IP	2.0	TRXW10IP	HFJ	ANT	BXH1235-D33	50
ANXA 16100R(S)○○							
ANXA 16125R(S)○○							
ANXA 16160R(S)○○						BXH2036-D50	200

The adjustment wrench (ANT) can also be used for height adjustment of the High-speed Cutter RF type and High-efficiency Cutter HF type.

■ Wiper Blade WS type Recommended Feed Rate

WS Cutting Edge Feed Rate per Tooth*1 f_{zws} (mm/t_{ws})	D ≤ 0.5	0.5 < D ≤ 1.7	1.7 < D
Burr-free Finish	◎ Excellent		Impossible
Mirror Finishing	◎ Excellent	○ Good	
Target Surface Roughness Ra (μm)	0.015 to 0.05	up to 0.6	

*1 Feed Rate per WS Cutting Edge Tooth f_{zws}

$$f_{zws}\ (mm/t_{ws}) = \frac{f_z \times (\text{Total No. of Teeth})^{*2}}{(\text{WS type No. of Teeth})^{*3}}$$

Feed Rate per Tooth fz

$$f_z\ (mm/t) = \frac{\text{Feed Rate (vf) (mm/min)}}{\text{Spindle Speed n (min}^{-1}) \times (\text{Total No. of Teeth})}$$

*2 Total number of teeth includes dummy blade and wiper blade (WS type).

*3 WS type number of teeth does not include dummy blade.

N·m Recommended Tightening Torque (N·m) ● mark: Standard Stocked Item (new product/expanded item)

ANXS 16000R(S) type

Rake Angle		
Rake	Radial	+5°
Angle	Axial	+5°

3mm 90°

Face Milling | Shoulder Milling | Groove Milling

Fig 1

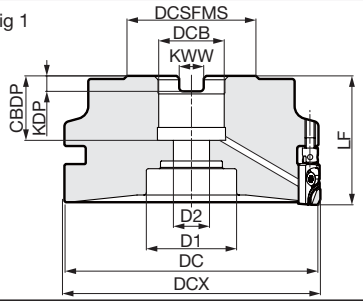
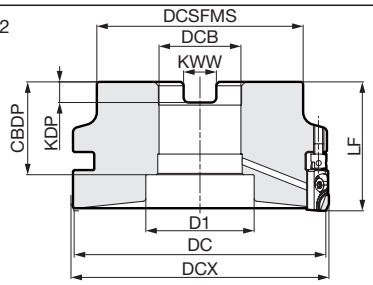


Fig 2



Body (Steel)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss Dia. DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**ANXS 16040RS04**	●	**40**	38	38.5	40	**16**	8.4	5.6	18	14	9	4	0.3	1
	16040RS06	●	**40**	38	38.5	40	**16**	8.4	5.6	18	14	9	6	0.3	1
	16050RS04	●	**50**	48	48.5	40	**22**	10.4	6.3	20	18	11	4	0.4	1
	16050RS06	●	**50**	48	48.5	40	**22**	10.4	6.3	20	18	11	6	0.4	1
	16050RS09	●	**50**	48	48.5	40	**22**	10.4	6.3	20	18	11	9	0.4	1
	16063RS06	●	**63**	61	50	40	**22**	10.4	6.3	20	18	11	6	0.7	1
	16063RS08	●	**63**	61	50	40	**22**	10.4	6.3	20	18	11	8	0.7	1
	16063RS12	●	**63**	61	50	40	**22**	10.4	6.3	20	18	11	12	0.7	1
	16080RS06	●	**80**	78	50	50	**27**	12.4	7	22	35	14	6	1.2	1
	16080RS10	●	**80**	78	50	50	**27**	12.4	7	22	35	14	10	1.2	1
	16080RS14	●	**80**	78	50	50	**27**	12.4	7	22	35	14	14	1.2	1
	16100RS08	●	**100**	98	80	50	**32**	14.4	8	32	46	—	8	1.9	2
	16100RS12	●	**100**	98	80	50	**32**	14.4	8	32	46	—	12	2.0	2
	16100RS18	●	**100**	98	80	50	**32**	14.4	8	32	46	—	18	2.0	2
	16125RS10	●	**125**	123	80	63	**40**	16.4	9	29	52	29	10	3.8	1
	16125RS14	●	**125**	123	80	63	**40**	16.4	9	29	52	29	14	3.9	1
	16125RS22	●	**125**	123	80	63	**40**	16.4	9	29	52	29	22	3.9	1
Inch	**ANXS 16063R06**	●	**63**	61	50	50	**25.4**	9.5	6	25	20	14	6	0.9	1
	16063R08	●	**63**	61	50	50	**25.4**	9.5	6	25	20	14	8	0.9	1
	16063R12	●	**63**	61	50	50	**25.4**	9.5	6	25	20	14	12	0.9	1
	16080R06	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	6	1.2	1
	16080R10	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	10	1.2	1
	16080R14	●	**80**	78	50	50	**25.4**	9.5	6	25	35	14	14	1.2	1
	16100R08	●	**100**	98	80	50	**31.75**	12.7	8	36	42	—	8	1.9	2
	16100R12	●	**100**	98	80	50	**31.75**	12.7	8	36	42	—	12	2.0	2
	16100R18	●	**100**	98	80	50	**31.75**	12.7	8	36	42	—	18	2.0	2
	16125R10	●	**125**	123	80	63	**38.1**	15.9	10	35.5	52	29	10	3.9	1
	16125R14	●	**125**	123	80	63	**38.1**	15.9	10	35.5	52	29	14	3.9	1
	16125R22	●	**125**	123	80	63	**38.1**	15.9	10	35.5	52	29	22	3.9	1

Blades are sold separately.
If using blades with corner radius (ANB1604R/ANB1608R), DC = DCX.
Weight indicated includes the weight with blades and other spare parts (excluding the centre bolt).
Note: The values in red have been changed from Rev. 3 and the 2021-2022 General Catalogue.

Identification Code

ANX	S	16	100	R	S	18
Series Code	Steel Body	Blade Size	Max. Dia.	Feed Direction	Metric Bore	Number of Teeth

ANXS 16000R(S) type

Expansion

Blade

Dimensions (mm)

Grade Classification		SUMIDIA		SUMICRYSTAL V
Process	High-speed/Light Cutting	N	KN	N
	General-purpose	N	KN	
	Roughing	N	KN	

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	Corner Radius RE	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●		—	6.0	—	Linear	Low Cutting Force	1
ANB 1600R-G	●		—	6.0	—	Arc-Shaped	General-purpose	1
ANB 1600R-GB		●	—	6.0	—	Arc-Shaped	Composite Milling*1	1
ANB 1600R-H	●	—	—	6.0	—	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●		—	9.0	—	Arc-Shaped	Long Edge	2
ANB 1604R	●		—	6.0	0.4	Linear	Corner Radius	3
ANB 1608R	●		—	6.0	0.8	Linear	Corner Radius	3
ANB 1600R-W	●		—	—	—	Arc-Shaped	Wiper	4
ANB 1600R-WS	—	—	●	—	—	Arc-Shaped	Wiper	5
ANBD	—	—	●*2	—	—	—	Dummy Blade	6

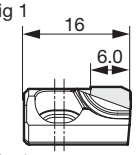
Fig 1 

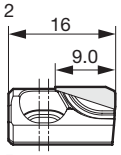
Fig 2 

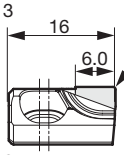
Fig 3 

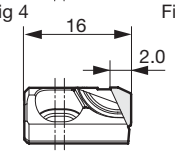
Fig 4 

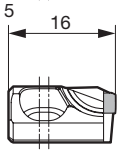
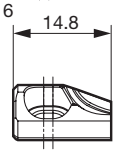
Fig 5 

Fig 6 

Wiper Blade | Wiper Blade | Dummy Blade

*1 Cast iron/aluminum alloy *2 Dummy blade for use with WS type (cemented carbide), refer to M36 "Precautions when Using Wiper Blades" (Mounting Precautions).

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000 SCV10

Si content of over 12.6%

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000 DA90 SCV10

Combined Milling of Cast Iron/Aluminum Alloy

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
K N	Cast Iron/ Aluminum Alloy	—	300 - **400** - 500	0.05 - **0.13** - 0.20	DA90

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
For combined milling of cast iron/aluminum alloy, we recommend DA90.
When using wiper blade WS type, refer to page M37.

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXS 16040RS04	25,000
16040RS06	25,000
16050RS04	25,000
16050RS06	25,000
16050RS09	25,000
16063RS06	22,000
16063RS08	22,000
16063RS12	22,000
16080RS06	20,000
16080RS10	20,000
16080RS14	20,000
16100RS08	18,000
16100RS12	18,000
16100RS18	18,000
16125RS10	16,000
16125RS14	16,000
16125RS22	16,000
ANXS 16063R06	22,000
16063R08	22,000
16063R12	22,000
16080R06	20,000
16080R10	20,000
16080R14	20,000
16100R08	18,000
16100R12	18,000
16100R18	18,000
16125R10	16,000
16125R14	16,000
16125R22	16,000

*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

Parts

Applicable Cutter	Cap Screw	N·m	Wrench	Adjustment Screw	Adjustment Wrench	Centre Bolt	N·m
ANXS 16040RS○○	BXA0310IP	2.0	TRXW10IP	HFJ	ANT	BXH0825-D13	15
ANXS 16050RS○○						BXH1030-D16	25
ANXS 16063RS○○							
ANXS 16080RS○○						BXH1235-D33	50
ANXS 16100RS○○						BXH1635-D40	100
ANXS 16125RS○○						BXH2036-D50	200
ANXS 16063R○○	BXA0310IP	2.0	TRXW10IP	HFJ	ANT	BXH1235-D18	40
ANXS 16080R○○						BXH1235-D33	50
ANXS 16100R○○						BXH1635-D40	100
ANXS 16125R○○						BXH2036-D50	200

The adjustment wrench (ANT) can also be used for height adjustment of the High-speed Cutter RF type and High-efficiency Cutter HF type.

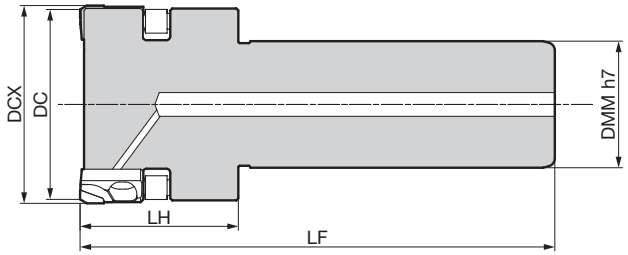
ANXS 16000E type

Rake Angle	Radial	-2° to 0°
	Axial	+5°

3mm 90°

Face Milling Shoulder Milling Groove Milling

Fig 1



Body (Steel)

Dimensions (mm)

Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Shank Dia. DMM	Head LH	Overall Length LF	Number of Teeth	Weight (kg)	Fig
ANXS 16025E02	●	**25**	23	20	35	95	2	0.2	1
16030E03	●	**30**	28	20	35	95	3	0.3	1
16030E04	●	**30**	28	20	35	95	4	0.3	1
16032E03	●	**32**	30	20	35	95	3	0.3	1
16032E04	●	**32**	30	20	35	95	4	0.3	1
16040E04	●	**40**	38	20	40	100	4	0.4	1
16040E06	●	**40**	38	20	40	100	6	0.5	1
16050E04	●	**50**	48	32	40	120	4	1.0	1
16050E06	●	**50**	48	32	40	120	6	1.0	1
16050E09	●	**50**	48	32	40	120	9	1.0	1

Blades are sold separately.
If using blades with corner radius (ANB1604R/ANB1608R), DC = DCX.
Weight indicated includes the weight with blades and other spare parts.

Identification Code

ANX	S	16	032	E	04
Series Code	Steel Body	Blade Size	Max. Dia.	Shank type	Number of Teeth

ANXS 16000E type

Expansion

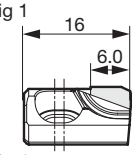
Blade

Dimensions (mm)

Grade Classification		SUMIDIA		SUMICRYSTAL V
Process	High-speed/Light Cutting	N	KN	N
	General-purpose	N	KN	
	Roughing	N	KN	

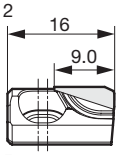
Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	Corner Radius RE	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●		—	6.0	—	Linear	Low Cutting Force	1
ANB 1600R-G	●		—	6.0	—	Arc-Shaped	General-purpose	1
ANB 1600R-GB		●	—	6.0	—	Arc-Shaped	Composite Milling*1	1
ANB 1600R-H	●	—	—	6.0	—	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●		—	9.0	—	Arc-Shaped	Long Edge	2
ANB 1604R	●		—	6.0	0.4	Linear	Corner Radius	3
ANB 1608R	●		—	6.0	0.8	Linear	Corner Radius	3
ANB 1600R-W	●		—	—	—	Arc-Shaped	Wiper	4
ANB 1600R-WS	—	—	●	—	—	Arc-Shaped	Wiper	5
ANBD	—	—	●*2	—	—	—	Dummy Blade	6

Fig 1



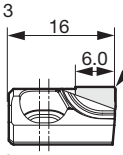
Wiper Blade

Fig 2



Wiper Blade

Fig 3



Dummy Blade

Fig 4

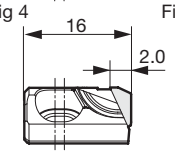


Fig 5

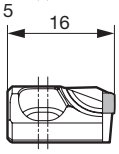
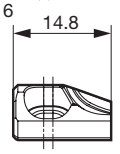


Fig 6



*1 Cast iron/aluminum alloy *2 Dummy blade for use with WS type (cemented carbide), refer to M36 "Precautions when Using Wiper Blades" (Mounting Precautions).

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	2,000 - **2,500** - 3,000	0.05 - **0.13** - 0.20	DA1000 SCV10

Si content of over 12.6%

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	—	400 - **600** - 800	0.05 - **0.13** - 0.20	DA1000 DA90 SCV10

Combined Milling of Cast Iron/Aluminum Alloy

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
K N	Cast Iron/ Aluminum Alloy	—	300 - **400** - 500	0.05 - **0.13** - 0.20	DA90

Note
- The above are the recommended conditions for ANX series overall. Use within the maximum allowable spindle speed.
- The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors. For combined milling of cast iron/aluminum alloy, we recommend DA90.
- When using wiper blade WS type, refer to page M37.

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXS 16025E02	10,000
16030E03	10,000
16030E04	10,000
16032E03	10,000
16032E04	10,000
16040E04	10,000
16040E06	10,000
16050E04	10,000
16050E06	10,000
16050E09	10,000

*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

Parts

Cap Screw		Wrench	Adjustment Screw	Adjustment Wrench
	N·m			
BXA0310IP	**2.0**	TRXW10IP	HFJ	ANT

The adjustment wrench (ANT) can also be used for height adjustment of the High-speed Cutter RF type and High-efficiency Cutter HF type.

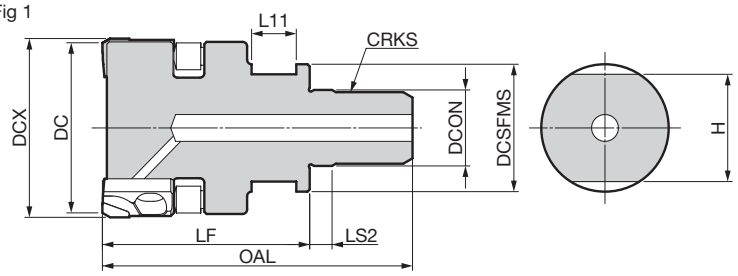
ANXS 16000M type

Rake Angle		
Rake	Radial	-2° to 0°
Angle	Axial	+5°

3mm 90°

Face Milling | Shoulder Milling | Groove Milling

Fig 1



Body (Steel)

Dimensions (mm)

	Cat. No.	Stock	Max. Dia. DCX	Dia. DC	Boss DCSFMS	Mounting Dia. DCON	Screw CRKS	Overall Length OAL	Effective Length LF	Length LS2	Chamfer L11	Width H	Number of Teeth	Weight (kg)	Fig
Metric	**ANXS 16025M12Z02**	●	**25**	23	23.0	12.5	**M12**	61	40	5	10	19	2	0.1	1
	16030M16Z03	●	**30**	28	28.5	17.0	**M16**	70	47	5	10	24	3	0.2	1
	16030M16Z04	●	**30**	28	28.5	17.0	**M16**	70	47	5	10	24	4	0.2	1
	16032M16Z03	●	**32**	30	28.5	17.0	**M16**	70	47	5	10	24	3	0.3	1
	16032M16Z04	●	**32**	30	28.5	17.0	**M16**	70	47	5	10	24	4	0.3	1
	16040M16Z04	●	**40**	38	28.5	17.0	**M16**	70	47	5	10	24	4	0.4	1
	16040M16Z06	●	**40**	38	28.5	17.0	**M16**	70	47	5	10	24	6	0.4	1

Blades are sold separately.
If using blades with corner radius (ANB1604R/ANB1608R), DC = DCX.
Weight indicated includes the weight with blades and other spare parts.

Arbors H255

Blade Expansion

Dimensions (mm)

Grade Classification		SUMIDIA		SUMICRYSTAL V
Process	High-speed/Light Cutting	N	KN	N
	General-purpose	N	KN	
	Roughing	N	KN	

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	Corner Radius RE	Wiper Edge Shape	Applications	Fig
ANB 1600R-L	●		—	6.0	—	Linear	Low Cutting Force	1
ANB 1600R-G	●		—	6.0	—	Arc-Shaped	General-purpose	1
ANB 1600R-GB		●	—	6.0	—	Arc-Shaped	Composite Milling*1	1
ANB 1600R-H	●	—	—	6.0	—	Arc-Shaped	Strong Edge	1
ANB 1600R-GX	●		—	9.0	—	Arc-Shaped	Long Edge	2
ANB 1604R	●		—	6.0	0.4	Linear	Corner Radius	3
ANB 1608R	●		—	6.0	0.8	Linear	Corner Radius	3
ANB 1600R-W	●		—	—	—	Arc-Shaped	Wiper	4
ANB 1600R-WS	—	—	●	—	—	Arc-Shaped	Wiper	5
ANBD	—	—	●*2	—	—	—	Dummy Blade	6

Fig 1

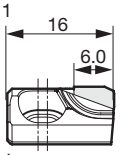


Fig 2

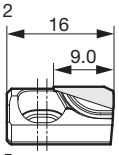


Fig 3

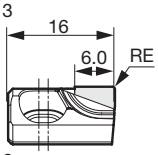
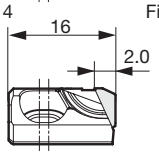
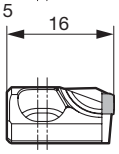


Fig 4



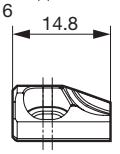
Wiper Blade

Fig 5



Wiper Blade

Fig 6



Dummy Blade

*1 Cast iron/aluminum alloy *2 Dummy blade for use with WS type (cemented carbide), refer to M36 "Precautions when Using Wiper Blades" (Mounting Precautions).

Recommended Cutting Conditions M41

Identification Code

ANX **S** **16** **032** **M16** **Z03**

ANX	S	16	032	M16	Z03
Series Code	Steel Body	Blade Size	Max. Dia.	Screw Size	Number of Teeth

Parts

Cap Screw		Adjustment Screw	Wrench	Adjustment Wrench
BXA0310IP	2.0	HFJ	TRXW10IP	ANT

The adjustment wrench (ANT) can also be used for height adjustment of the High-speed Cutter RF type and High-efficiency Cutter HF type.

Maximum Allowable Spindle Speed

Cat. No.	n max(min^{-1})
ANXS 16025M12Z02	10,000
16030M16Z03	10,000
16030M16Z04	10,000
16032M16Z03	10,000
16032M16Z04	10,000
16040M16Z04	10,000
16040M16Z06	10,000

*The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

N·m Recommended Tightening Torque (N·m) ● mark: Standard stocked item (new product/expanded item)

MEMO

HF series

VIDEO OF CUTTING

■ Features

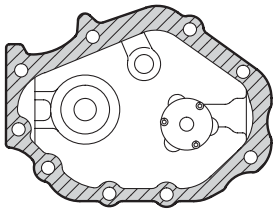
The HF type high-efficiency aluminum alloy cutter employs a unique blade design to achieve machining without burrs.
HFFH type with coolant holes is now available as a BBT30 (BIG-PLUS™) arbor integrated version.

Work Material

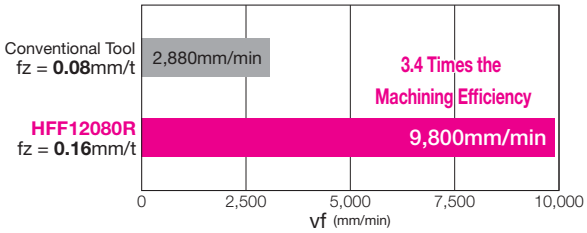
· Aluminum and aluminum alloys
· Other non-ferrous metals
(Not suited for cast iron or steel.)

● Achieves high-efficiency milling with vf of over 20,000 mm/min thanks to its multi-blade design (3 teeth per inch)

High-feed, High-efficiency Milling with Multi-blade Design



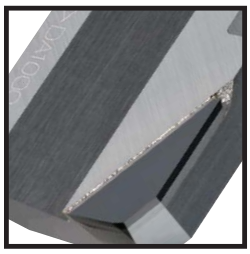
Workpiece: Aluminum Case (Frame Milling)
Tool: **HFF12080R-25.4** (ø80 10-tooth),
Conventional Tool (ø80 6-tooth)



■ Maximum Allowable Spindle Speed and Feed Rate

Cutter Dia. (mm)	nmax (min⁻¹)	vc (m/min)	fz (mm/t)	Max. No. of Teeth (pcs.)	vf (mm/min)
ø80	11,000	2,763	up to 0.2	10	up to 22,000
ø100	9,500	2,983	up to 0.2	12	up to 22,800
ø125	7,500	2,944	up to 0.2	15	up to 22,500

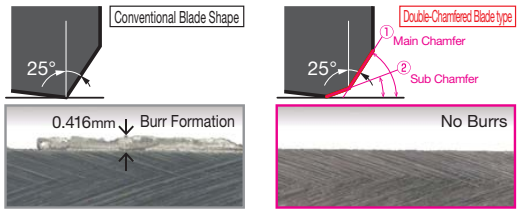
* The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.



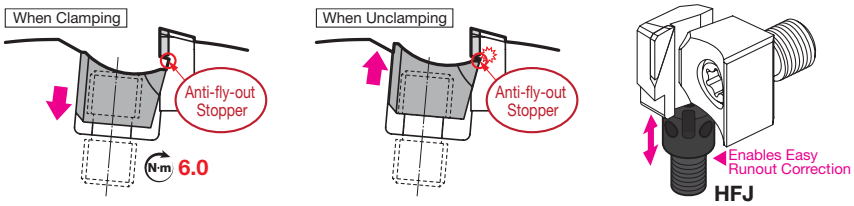
● Reduces burrs by using a double-chamfered blade type

Drastically reduces burrs by preventing plastic deformation that causes burrs.

Work Material: **A6061** Rolled Steel
Cutting Conditions: vc = **3,142**m/min,
fz = **0.10**mm/t,
ap = **0.5**mm, Dry



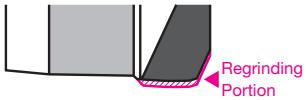
● Wedge clamp with anti-fly-out mechanism ensures safety and operability

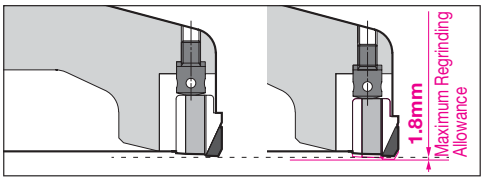


Ensure that the maximum allowable spindle speed (n max) specified for each cutter diameter is not exceeded. (See the table at upper right)

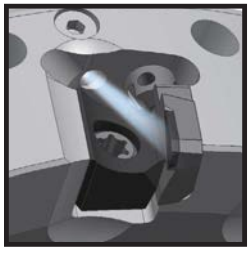
● Reduces running costs by drastically increasing blade regrinding allowance (to 1.8mm)

Assuming 0.2mm of regrinding each time, an edge can be used up to 10 times.
(Given conditions of normal wear with ap = **1.4**mm or less)





The regrinding allowance has been drastically increased compared to conventional screw-lock types.



● Internal coolant improves chip evacuation performance (HFFH type, HFFH-BBT30 type)

The internal coolant effectively prevents chips from becoming clogged or biting into the work material and achieves longer tool life. (Use an internal coolant compatible arbor)

*1: BIG-PLUS™ is a registered trademark of BIG DAISHOWA Co., Ltd.
*2: Can also be used with BT30 spindle machines.

N·m Recommended Tightening Torque (N·m)

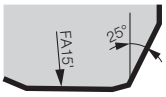
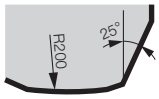
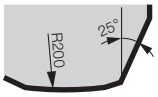
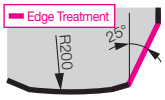
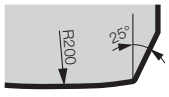
HF series

■ Product Range

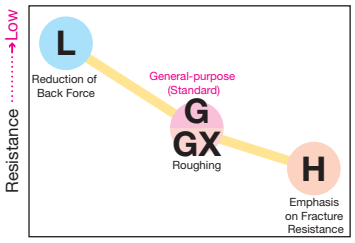
Type	Cat. No.	Dia. (mm) ø80	ø100	ø125
Shell	HFM 12000RS	6*	8	10*
	HFM 12000R (Inch)	6	8*	10*
	HFF 12000RS	10*	12	15*
	HFF 12000R (Inch)	10	12*	15*
	HFFH 12000RS	10*	12	15*
	HFFH 12000R (Inch)	10	12*	15*
	HFFH 12000R-BBT30	10	12	15

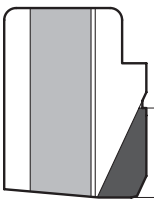
Number in ● shows the number of teeth (Inch) Inch Bore *mark: Different diameter shanks in stock

■ Blade Selection Guide

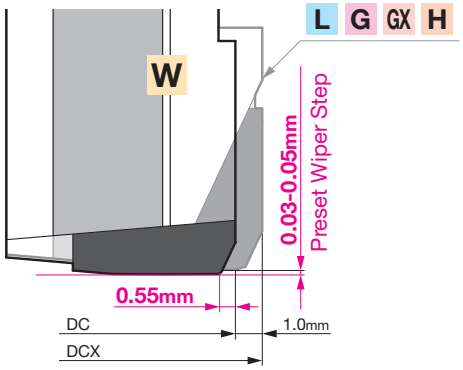
Work Material	N				
Applications	Reduction of Back Force	General-purpose	Roughing	Emphasis on Fracture Resistance	Finishing
Features	Low Cutting Force	Standard	Long Edge	High Strength	Wiper
Type	L type	G type	GX type	H type	W type
Cutting Edge Shape					
Edge Length (*)	6.0mm	6.0mm	9.0mm	6.0mm	2.0mm

■ Blade Selection Reference



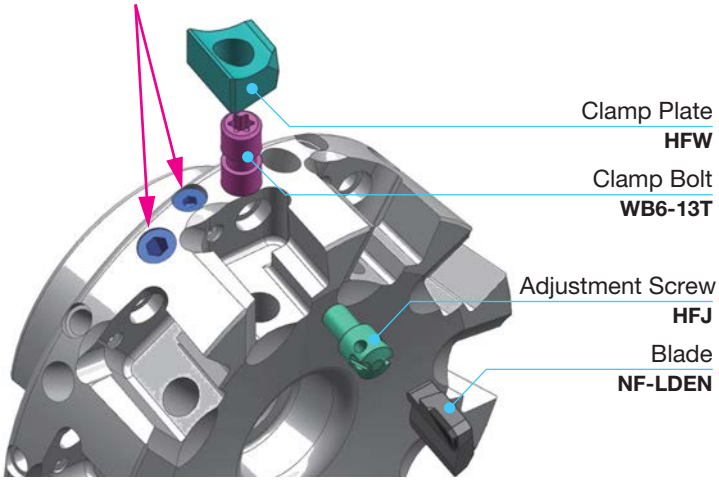


■ Wiper Blade Step Amount



■ Structure of HF type

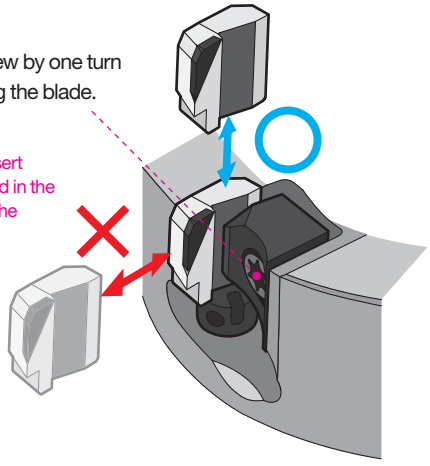
The axial set screw and balance adjustment screw hole have an embedded special part that prevents the insertion of screwdrivers or hex wrenches.



■ Blade Mounting Direction

Loosen the screw by one turn before removing the blade.

⚠ Note that if the insert is forcibly removed in the wrong direction, the part may break.



High-efficiency Cutter for Aluminum Alloys

HFM 12000RS/R type

Rake Angle		
Rake	Radial	4°
Angle	Axial	10°

3mm 90°

Face Milling

Fig 1

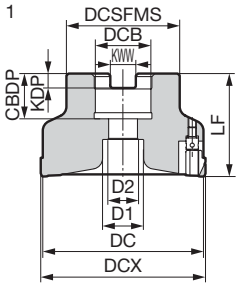


Fig 2

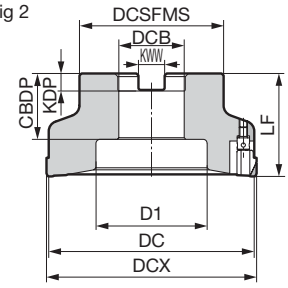
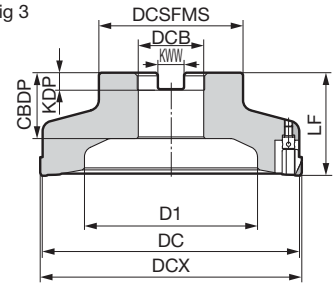


Fig 3



Body (Fine Pitch: 2-teeth/Inch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**HFM 12080RS-22**	●	**80**	82	50	40	**22**	10.4	6.3	20	18	11	6	1.0	1
	12080RS-27	●	**80**	82	55	50	**27**	12.4	7	22	20	14	6	1.2	1
	12100RS-32	●	**100**	102	70	50	**32**	14.4	8	32	54	—	8	1.7	2
	12125RS-32	●	**125**	127	70	50	**32**	14.4	8	32	84	—	10	2.2	3
	12125RS-40	●	**125**	127	90	63	**40**	16.4	9	35	84	—	10	2.8	3
Inch	**HFM 12080R-25.4**	●	**80**	82	50	50	**25.4**	9.5	6	30	35	—	6	1.0	2
	12100R-25.4	●	**100**	102	50	50	**25.4**	9.5	6	30	54	—	8	1.5	2
	12100R-31.75	●	**100**	102	70	50	**31.75**	12.7	8	32	54	—	8	1.7	2
	12125R-25.4	●	**125**	127	50	50	**25.4**	9.5	6	30	84	—	10	2.0	3
	12125R-31.75	●	**125**	127	70	50	**31.75**	12.7	8	32	84	—	10	2.2	3
	12125R-38.1	●	**125**	127	80	63	**38.1**	15.9	10	36	84	—	10	2.5	3

Blades are sold separately.

Blade

Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
NF-LDEN 12T3ZDFR-L	●	6.0	Linear	Low Cutting Force	1
12T3ZDFR-G	●	6.0	Arc-Shaped	General-purpose	1
12T3ZDTR-H	●	6.0	Arc-Shaped	Strong Edge	1
12T3ZDFR-GX	●	9.0	Arc-Shaped	Long Edge	2
12T3ZDFR-W	●	2.0	Arc-Shaped	Wiper	3

Fig 1

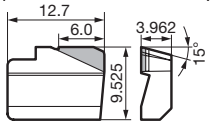


Fig 2

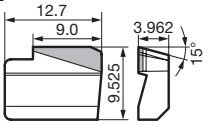
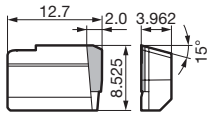


Fig 3 Wiper Blade



Parts

(Sold Separately)

Clamp Plate	Bolt		Adjustment Screw	Wrench	Wrench	Assembly Wrench
		N·m				
HFW	WB6-13T	6.0	HFJ	TTX20	RFT	HFVT

Identification Code

HF M 12 080 R S - 22

Series Code	Fine Pitch	Blade Size	Dia.	Feed Direction	Metric Bore	Hole Dia.

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	2,000- **2,500** -3,000	0.05- **0.13** -0.20	DA1000

Note
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- The above are the recommended conditions for HF type overall. Use within the maximum allowable spindle speed.

Si content of over 12.6%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	400- **600** -800	0.05- **0.13** -0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

HFF 12000RS/R type

Rake Angle		
	Radial	4°
	Axial	10°

3mm 90°

Face Milling

Fig 1

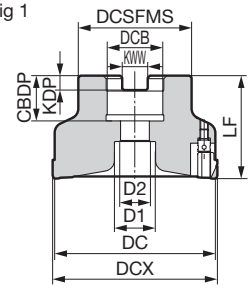


Fig 2

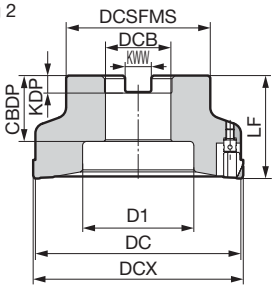
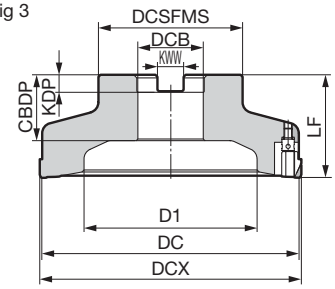


Fig 3



Body (Extra Fine Pitch: 3-Tooth/Inch)

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**HFF 12080RS-22**	●	**80**	82	50	40	**22**	10.4	6.3	20	18	11	10	1.0	1
	12080RS-27	●	**80**	82	55	50	**27**	12.4	7	22	20	14	10	1.2	1
	12100RS-32	●	**100**	102	70	50	**32**	14.4	8	32	54	—	12	1.7	2
	12125RS-32	●	**125**	127	70	50	**32**	14.4	8	32	84	—	15	2.2	3
	12125RS-40	●	**125**	127	90	63	**40**	16.4	9	35	84	—	15	2.8	3
Inch	**HFF 12080R-25.4**	●	**80**	82	50	50	**25.4**	9.5	6	30	35	—	10	1.0	2
	12100R-25.4	●	**100**	102	50	50	**25.4**	9.5	6	30	54	—	12	1.5	2
	12100R-31.75	●	**100**	102	70	50	**31.75**	12.7	8	32	54	—	12	1.7	2
	12125R-25.4	●	**125**	127	50	50	**25.4**	9.5	6	30	84	—	15	2.0	3
	12125R-31.75	●	**125**	127	70	50	**31.75**	12.7	8	32	84	—	15	2.2	3
	12125R-38.1	●	**125**	127	80	63	**38.1**	15.9	10	36	84	—	15	2.5	3

Blades are sold separately.

Blade

Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
NF-LDEN 12T3ZDFR-L	●	6.0	Linear	Low Cutting Force	1
12T3ZDFR-G	●	6.0	Arc-Shaped	General-purpose	1
12T3ZDTR-H	●	6.0	Arc-Shaped	Strong Edge	1
12T3ZDFR-GX	●	9.0	Arc-Shaped	Long Edge	2
12T3ZDFR-W	●	2.0	Arc-Shaped	Wiper	3

Fig 1

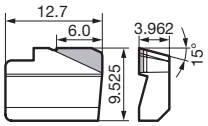


Fig 2

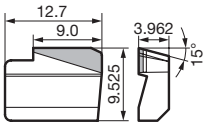
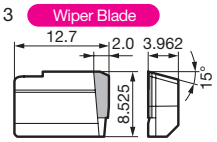


Fig 3 Wiper Blade



Parts

(Sold Separately)

Clamp Plate	Bolt		Adjustment Screw	Wrench	Wrench	Assembly Wrench
HFW	WB6-13T	**6.0**	HFJ	TTX20	RFT	HFVT

Identification Code

HF F 12 080 R S - 22

Series Code	Extra Fine Pitch	Blade Size	Dia.	Feed Direction	Metric Bore	Hole Dia.

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	2,000- **2,500** -3,000	0.05- **0.13** -0.20	DA1000

Note
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
- The above are the recommended conditions for HF type overall. Use within the maximum allowable spindle speed.

Si content of over 12.6%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	400- **600** -800	0.05- **0.13** -0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

High-efficiency Cutter for Aluminum Alloys

HFFH 12000RS/R type

Rake Angle		
	Radial	4°
	Axial	10°

3mm 90°

Face Milling

Fig 1

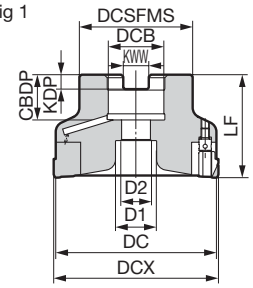


Fig 2

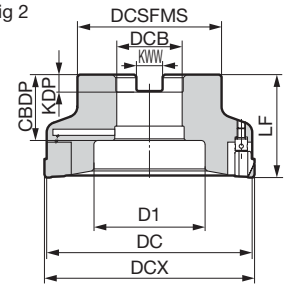
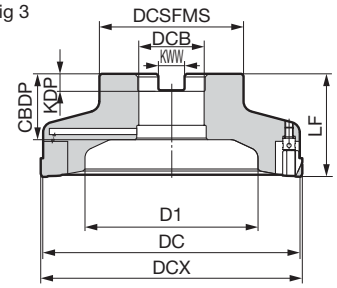


Fig 3



Body (Extra Fine Pitch: 3-Tooth/Inch) With Coolant Holes

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Bolt D1	Bolt D2	Number of Teeth	Weight (kg)	Fig
Metric	**HFFH 12080RS-22**	●	**80**	82	50	40	**22**	10.4	6.3	20	18	11	10	1.0	1
	12080RS-27	●	**80**	82	55	50	**27**	12.4	7	22	20	14	10	1.2	1
	12100RS-32	●	**100**	102	70	50	**32**	14.4	8	32	54	—	12	1.7	2
	12125RS-32	●	**125**	127	70	50	**32**	14.4	8	32	84	—	15	2.2	3
	12125RS-40	●	**125**	127	90	63	**40**	16.4	9	35	84	—	15	2.8	3
Inch	**HFFH 12080R-25.4**	●	**80**	82	50	50	**25.4**	9.5	6	30	35	—	10	1.0	2
	12100R-25.4	●	**100**	102	50	50	**25.4**	9.5	6	30	54	—	12	1.5	2
	12100R-31.75	●	**100**	102	70	50	**31.75**	12.7	8	32	54	—	12	1.7	2
	12125R-25.4	●	**125**	127	50	50	**25.4**	9.5	6	30	84	—	15	2.0	3
	12125R-31.75	●	**125**	127	70	50	**31.75**	12.7	8	32	84	—	15	2.2	3
	12125R-38.1	●	**125**	127	80	63	**38.1**	15.9	10	36	84	—	15	2.5	3

Blades are sold separately.

Blade

Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
NF-LDEN 12T3ZDFR-L	●	6.0	Linear	Low Cutting Force	1
12T3ZDFR-G	●	6.0	Arc-Shaped	General-purpose	1
12T3ZDTR-H	●	6.0	Arc-Shaped	Strong Edge	1
12T3ZDFR-GX	●	9.0	Arc-Shaped	Long Edge	2
12T3ZDFR-W	●	2.0	Arc-Shaped	Wiper	3

Fig 1

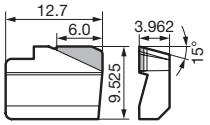


Fig 2

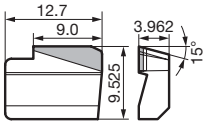
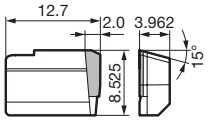


Fig 3 Wiper Blade



Parts

(Sold Separately)

Clamp Plate	Bolt		Wrench	Adjustment Screw	Wrench	Assembly Wrench
		N·m				
HFW	WB6-13T	**6.0**	TTX20	HFJ	RFT	HFVT

Identification Code

HF	F	H	12	080	R	S	-	22
Series Code	Extra Fine Pitch	With Oil Hole	Blade Size	Dia.	Feed Direction	Metric Bore		Hole Dia.

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	2,000- **2,500** -3,000	0.05- **0.13** -0.20	DA1000

Note
- The above are the recommended conditions for HF type overall. Use within the maximum allowable spindle speed.
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Si content of over 12.6%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	400- **600** -800	0.05- **0.13** -0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

N·m Recommended Tightening Torque (N·m)

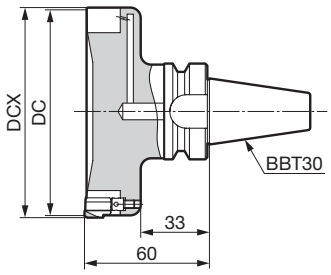
HFFH 12000R-BBT30 type

Rake Angle	Radial	4°
	Axial	10°

3mm 90°

Face Milling

Fig 1



Body (Extra Fine Pitch: 3-Tooth/Inch) With Coolant Holes

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Number of Teeth	Weight (kg)	Fig
Inch	**HFFH 12080R-BBT30**	●	**80**	82	10	1.6	1
	12100R-BBT30	●	**100**	102	12	2.4	1
	12125R-BBT30	●	**125**	127	15	2.6	1

Blades are sold separately.

Note: The values in red have been changed from the 2021-2022 General Catalogue.

Blade

Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	N
	Roughing	N

Cat. No.	DA1000	Cutting Edge Length	Wiper Edge Shape	Applications	Fig
NF-LDEN 12T3ZDFR-L	●	6.0	Linear	Low Cutting Force	1
12T3ZDFR-G	●	6.0	Arc-Shaped	General-purpose	1
12T3ZDTR-H	●	6.0	Arc-Shaped	Strong Edge	1
12T3ZDFR-GX	●	9.0	Arc-Shaped	Long Edge	2
12T3ZDFR-W	●	2.0	Arc-Shaped	Wiper	3

Fig 1

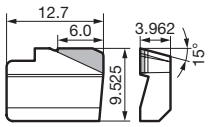


Fig 2

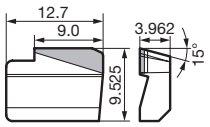
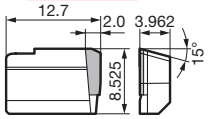


Fig 3 Wiper Blade



Parts

(Sold Separately)

Clamp Plate	Bolt		Wrench	Adjustment Screw	Wrench	Assembly Wrench
		N·m				
HFW	WB6-13T	6.0	TTX20	HFJ	RFT	HFVT

Identification Code

HF	F	H	12	080	R	-	BBT30
Series Code	Extra Fine Pitch	With Oil Hole	Blade Size	Dia.	Feed Direction		Supported Arbor Symbol

Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	2,000- **2,500** -3,000	0.05- **0.13** -0.20	DA1000

Note
- The above are the recommended conditions for HF type overall. Use within the maximum allowable spindle speed.
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Si content of over 12.6%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Blade Grade
N	Aluminum Alloy	400- **600** -800	0.05- **0.13** -0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

* BIG-PLUS™ is a registered trademark of BIG DAISHOWA Co., Ltd.
* Can also be used with BT30 spindle machines.

RF series

■ Features

The RF series cutter has a lightweight body designed for high-speed, high-performance roughing to finish milling of aluminum alloys and other non-ferrous metals.

■ Work Material

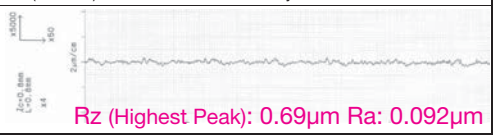
- Aluminum and aluminum alloys
- Other Non-Ferrous Metals

(Not suited for cast iron or steel.)

- **From Roughing to Finishing Processes:** Roughing: Economical carbide insert / Finishing: High-precision SUMIDIA insert
- **Strong and Lightweight Body:** Special aluminum alloy body. 40% lighter than steel cutters. Hard anodizing. Improved efficiency with higher spindle speeds, lower spindle loads and shorter tool change time
- **Safety Design:** Prevents inserts from dislodging from cutter due to centrifugal force. (Speeds must be within max. recommended conditions)
  To prevent warping, wedges are not used in the cutter construction
- **Easy Runout Adjustment:** External setting gauge is used for easy tool presetting. High-precision cutter construction - units fitted are within 10µm runout even before setting

■ Surface Finish

- Process: Finish Milling
- Machine: Vertical Machining Centre
- Arbor: HSK63A
- Work Material: Si 10 to 12% Al Alloy
- Cutter: RF4100R 6-Tooth (1 Wiper)
- Grade: SUMIDIA (DA1000)
- vc = 4,990m/min
- n = 15,900min^{-1}
- vf = 11,400mm/min
- fz = 0.12mm/t
- ap = 0.5mm, Wiper ap = 0.03mm, Dry



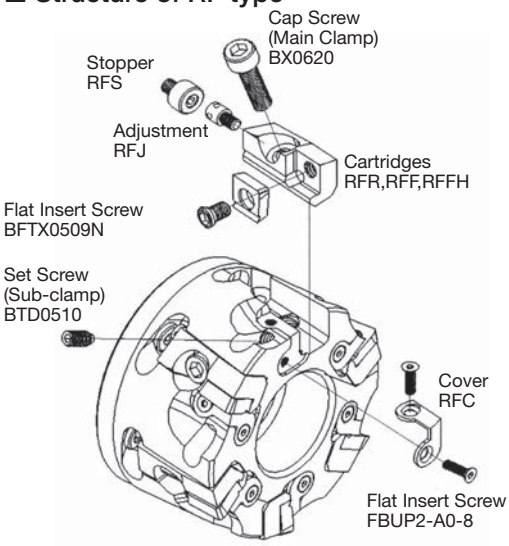
Rz (Highest Peak): 0.69µm Ra: 0.092µm

● Maximum Allowable Spindle Speed

Cat. No.	n max (min^{-1})
RF4080R	17,000
RF4100R	15,900
RF4125R	13,500
RF4160R	11,000
RF4200R	9,000
RF4250R	7,600
RF4315R	6,000

* The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.

■ Structure of RF type



■ Recommended Cutting Conditions

Si content of 12% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	2,000-**2,500**-3,000	0.05-**0.13**-0.20	DA1000 DA2200
		300-**650**-1,000	0.05-**0.13**-0.20	H1

Note
- The above are the recommended conditions for RF type overall. Use within the maximum allowable spindle speed.
- The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Si content of over 12%

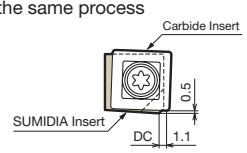
ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	400- **600** -800	0.05-**0.13**-0.20	DA1000 DA2200
		200- **300** -400	0.05-**0.13**-0.20	H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

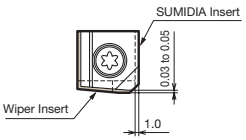
● Recommended Cutting Edge Position

We recommend positioning as in the figure below when mounting carbide inserts or SUMIDIA inserts (blades).

- When roughing and finishing in the same process



- When using wiper edge



■ Product Range

Type	Cat. No.	Dia. (mm)						
		ø80	ø100	ø125	ø160	ø200	ø250	ø315
Shell	RF 4000R (Inch)	6	6	8	10	12	16	18

Number in ●○ shows the number of teeth (Inch) Inch Bore

⚠ CAUTIONS (For more details, refer to the instruction manual included with the product)

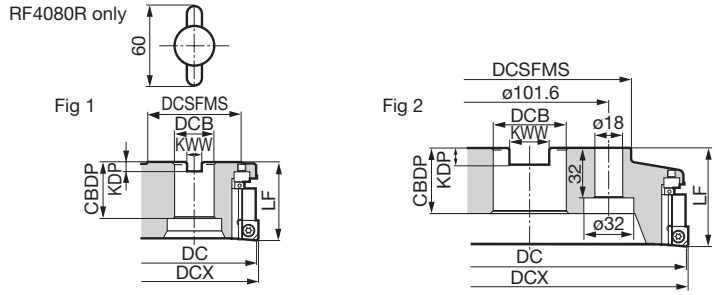
As it is possible to mix different types of inserts/blades, it is important to take note of the following.

- Do not mix reground and new inserts or inserts with a different regrinding allowance on the same cutter.
- Carbide and SUMIDIA inserts must be arranged alternately.
- When using a combination of SUMIDIA blades and inserts, ensure proper balance by mounting the same type of cutting edges on opposite sides of the cutter.

RF 4000R type

Rake Angle		
Radial	4°	
Axial	10°	

3mm 90° (SUMIDIA Insert) 10mm 87° (Carbide Insert) Face Milling



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Max. Dia. DCX	Boss DCSFMS	Overall Length LF	Hole Dia. DCB	Keyway Width KWW	Keyway Depth KDP	Mounting Depth CBDP	Number of Teeth	Weight (kg)	Fig
Inch	**RF 4080R**	●	**80**	82	60	50	**25.4**	9.5	6	30	6	0.7	1
	4100R	●	**100**	102	75	50	**31.75**	12.7	8	38	6	1.0	1
	4125R	●	**125**	127	75	63	**38.1**	15.9	10	38	8	1.6	1
	4160R	●	**160**	162	100	63	**50.8**	19.1	11	38	10	2.6	1
	4200R	●	**200**	202	130	63	**47.625**	25.4	14	42	12	3.6	2
	4250R		**250**	252	130	63	**47.625**	25.4	14	42	16	6.0	2
	4315R		**315**	317	240	80	**47.625**	25.4	14	42	18	11.0	2

Cartridges, blades and inserts are sold separately.
Use a flanged bolt to mount the cutter to the arbor.

Insert/Cartridge

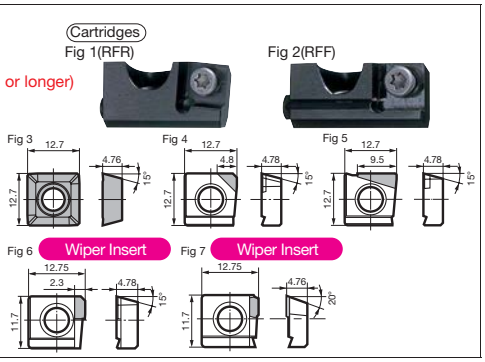
Dimensions (mm)

Grade Classification		Cemented Carbide	DLC	SUMIDIA		SUMICRYSTAL
Process	High-speed/Light Cutting	N	N	N	N	N
	General-purpose	N	N	N	N	
	Roughing	N	N	N	N	

Refer to page M64 for details of SUMICRYSTAL.

*When using large depth of cut (ap = 3mm or longer) with RF4080R, use the RFFH cartridge. (RFF is possible for normal cutting.)

Cat. No.	H1	DL1000	DA1000	DA2200	SC10	Fig	Cartridges Cat. No.	Cartridges Stock	Fig
SDET 1204ZDFR	●	●	—	—	—	3	RFR	●	1
NF-SNEW 1204ADFR	—	—	●	▲	—	4	RFF	●	2
120404ADFR-H	—	—	●	—	—	5	RFF (Others) *RFFH(RF4080R)	●	2
1204ADFR-W	—	—	●	▲	—	6	RFF	●	2
SNEW 1204ADFR-WS	—	—	—	—	●	7	RFF	●	2



An "H" at the end of the part number indicates large depth of cut type, while "W" or "WS" indicates a wiper insert.

Parts

Cover	Stopper	Cap Screw		Set Screw		Flat Insert Screw	Adjustment	Flat Insert Screw		Wrench	Wrench
		Main Clamp	N·m	Sub-clamp	N·m	Cover Mounting			N·m		
RFC	RFS	BX0620	10.0	BTD 0510	3.0	FBUP2-A0-8	RFJ	BFTX 0509N	5.0	TH050 TH025 RFT	TTX20

Blades/Dummy Blades

Product Name	Cat. No.	SUMIDIA DA2200
SUMIDIA Blade	RFB	●
SUMIDIA Wiper Blade	RFBW	●
Dummy Blade	RFD	●(Steel)

Use dummy blades for unused teeth to protect the body as well as maintaining balance.

Setting Parts

Cartridge design allows inserts to be attached outside the machine with high precision.

Setting Gauge RF-SET (Sold Separately/ Standard Stock)

Clamp Jig RF-JIG (Sold Separately/ Standard Stock)

*Dial gauge is not included.

Internal Coolant Attachments

For internal coolant supply, use an internal coolant holder or a commercially available clamp bolt with coolant holes.
Typical examples are given in the table below. For specifications, contact each manufacturer directly.

Body Cat. No.	Internal Coolant Holder	Standard Clamp Bolt with Coolant Hole (Example)	
		MST Corporation	BIG DAISHOWA
RF 4080R	—	MBC-M12	TMBA-M12
RF 4100R	—	MBC-M16	TMBA-M16
RF 4125R	—	MBC-M20	TMBA-M20
RF 4160R	—	MBC-M24	TMBA-M24
RF 4200R	RF-CLT	—	—
RF 4250R	RF-CLT	—	—
RF 4315R	RF-CLT	—	—

Direction of Coolant Streams

Internal Coolant Holders RF-CLT (Standard Stock)

Standard Clamp Bolt with Coolant Hole [Typical Example] MBC-M12 to M24 (Sold Separately)

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

SRF series

■ Features

The SRF type is ideal for aluminum alloy machining on high-performance small machines.

- **Ideal for small machines**
  Especially reliable on BT30 class small machines.
- **From roughing to finishing processes**
  Utilises SUMIDIA DA1000 inserts with effective cutting edge length of 5mm.
- **Economical NF type inserts:**
  NF type SUMIDIA inserts with tough DA1000 grade lower tooling costs.
- **High-speed cutting with SUMIDIA:**
  Maximum spindle speeds of up to n = 20,000min^{-1}
  (Please operate within the maximum allowable spindle speed of the machine and holder used)
  *The maximum allowable spindle speeds are set to prevent the inserts from dislodging by centrifugal force.
- **Simple runout adjustment mechanism:**
  Simple direct insert mounting design with easy fine-adjustment for runout precision.

■ Recommended Cutting Conditions

Si content of 12% or less

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	2,000- **3,000** -4,000	0.05-**0.13**-0.20	DA1000

Note
· The above are the recommended conditions for SRF type overall. Use within the maximum allowable spindle speed.
· The cutting conditions are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Si content of over 12%

ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	400- **600** -800	0.05-**0.13**-0.20	DA1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

SRF series

Rake Angle	Radial	-2° to 4°
	Axial	6°

5mm 90°

Face Milling Shoulder Milling

Fig 1

Fig 2

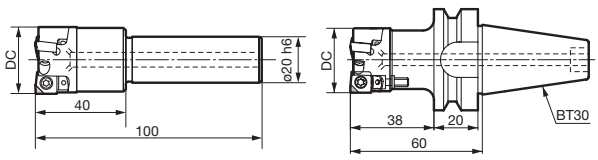


Fig 3

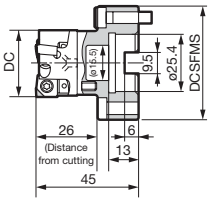
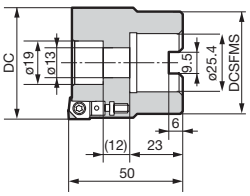


Fig 4



Body

Dimensions (mm)

	Cat. No.	Stock	Dia. DC	Boss DCSFMS	Number of Teeth	Weight (kg)	Fig
Inch	SRF 30R-ST	●	30	—	3	0.34	1
	40R-ST	●	40	—	4	0.50	1
	SRF 30R-BT30	●	30	—	3	0.57	2
	40R-BT30	●	40	—	4	0.72	2
	SRF 30R	●	30	50.0	3	0.27	3
	40R	●	40	50.0	4	0.35	3
	50R	●	*50	46.5	5	0.59	4
	63R	●	*63	45.0	6	0.67	4

Inserts are sold separately.

■ Product Range

Type	Cat. No.	Dia. (mm) ø30	ø40	ø50	ø63
Shell	SRF 30R(-ST)	3			
	SRF 40R(-ST)		4		
	SRF 30R-BT30	3			
	SRF 40R-BT30		4		
	SRF 50R (Inch)			5	
	SRF 63R (Inch)				6

Number in ● shows the number of teeth (Inch) Inch Bore

Note For mounting the cutters marked with * to an arbor, use a hex socket bolt (JIS B1176) M12 x 30 to 35mm.

Insert

Dimensions (mm)

Grade Classification		SUMIDIA	
Process	High-speed/Light Cutting	N	N
	General-purpose	N	N
	Roughing	N	N

Cat. No.	DA1000	DA2200	Cutting Edge Shape	Fig
NF-SNEW 09T3ADTR	●	▲	Standard	1
09T3ADTR-U	●	▲	Wiper Flat	2
09T3ADTR-R	●	▲	Corner Radius	3

Fig 1

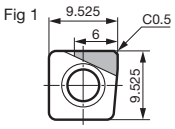


Fig 2

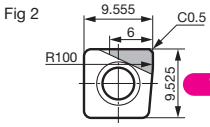
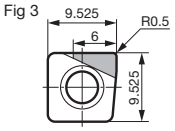
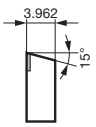


Fig 3

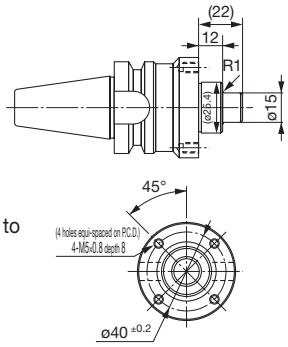


Side View (Same For All)



Recommended Cutting Conditions ☞ M52

- Standard inserts and wiper inserts can be used on the same cutter body.
- Standard inserts with corner radius should be used where chatter is present. These cannot be used with wiper inserts.
- Inserts can be reground 3 times (up to minimum IC diameter of 9.225mm), but the cutting edge height changes by the reground amount.
- Do not mix new and reground inserts or inserts with different regrind amounts on the same cutter.
- When using reground inserts, it is advisable to re-confirm cutting edge position with a tool pre-setter.
- Arbor for SRF30R, SRF40R



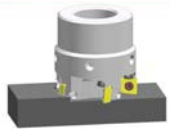
When using SRF30R and SRF40R cutters, the arbor needs to be modified as shown above.
(1. Reduce part of the arbor's adapter shaft length from ø25.4 to ø15. 2. Add 4 tap holes for (M5) mounting bolts.) Use hex socket bolts M5 × 20mm for securing the body.

Maximum Depth of Cut (SRF50R, 5-Tooth)

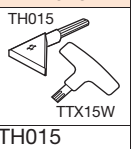
The table below contains guidelines on the maximum depth of cut, determined from internal tests. 'O' marks indicate the possible application range. Actual cutting conditions should be set based on the actual machine and workpiece characteristics.

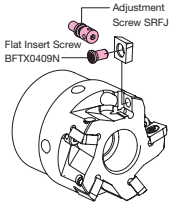
Depth of Cut ap (mm) \ Feed Rate	Feed Rate (vf) (mm/min) 2,500	4,000	5,000
	Feed Rate Per Tooth fz (mm/t) 0.05	0.08	0.10
0.5	○	○	○
1.0	○	○	○
1.5	○	○	○
2.0	○	○	○
2.5	○	○	○
3.0	○	○	○
3.5	○	○	—
4.0	○	—	—
4.5	○	—	—
5.0	○	—	—

Cutting Conditions
Cutter : SRF50R
Insert : NF-SNEW 09T3ADTR (DA1000)
n = 10,000min^{-1}
Arbor : BT30 FMA25.4-45
Workpiece : A-5052
Width : Maximum depth of cut at 35mm



Parts

Flat Insert Screw		Adjustment Screw	Wrench
	N·m		 TH015 TTX15W
BFTX0409N	4.0	SRFJ	TH015 TTX15W



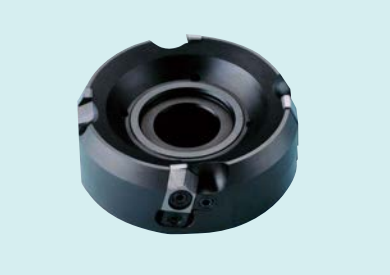
N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

FAM series/SAM series

Rake Angle		(FAM series)	(SAM series)
	Radial	+4°	+6°
	Axial	+13°	+10°

5.8mm 65° FAM

5.7mm 90° SAM



■ Features

- Optimized cutting edge design for excellent cutting performance in the machining non-ferrous metals such as aluminum alloys.
- Blade runout can be adjusted to improve the quality of the machined surface finish.
- High rigidity body with blades mounted firmly by double-clamp allow its used in roughing processes.

Approach Angle: 25°
Axial Rake Angle: +13°
Radial Rake Angle: +4°

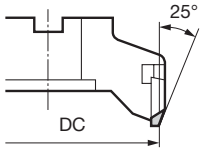


Fig 1

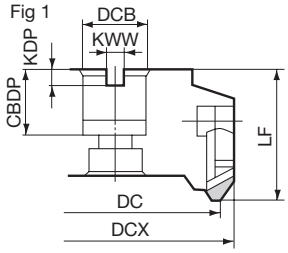


Fig 2

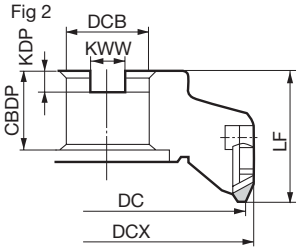
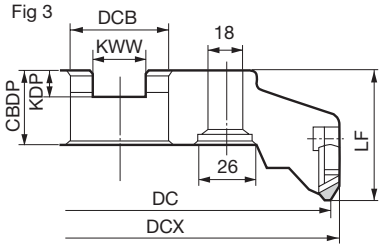


Fig 3



Body (FAM series)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Max. Dia. DCX	Height LF	Bore Dia. DCB	Mounting Depth CBDP	Keyway Width KWW	Keyway Depth KDP	Number of Teeth	Weight (kg)	Fig
Inch	**FAM080 R/L**			**80**	92	50	**25.4**	25	9.5	6	4	2.1	1
	FAM100 R/L			**100**	112	50	**31.75**	32	12.7	8	4	2.9	2
	125 R/L			**125**	137	63	**38.1**	38	15.9	10	5	3.8	2
	160 R/L			**160**	171	63	**50.8**	38	19.1	11	6	6.6	2
	FAM200 R/L			**200**	210	63	**47.625**	38	25.4	14	8	9.9	3
	250 R/L			**250**	260	63	**47.625**	40	25.4	14	10	16.0	3
	315 R/L			**315**	325	63	**47.625**	40	25.4	14	12	25.1	3

Inserts are sold separately.

Approach Angle: 0°
Axial Rake Angle: +10°
Radial Rake Angle: +6°

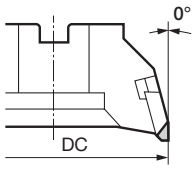


Fig 1

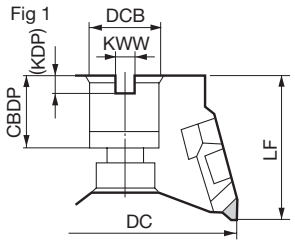


Fig 2

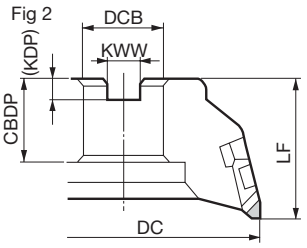
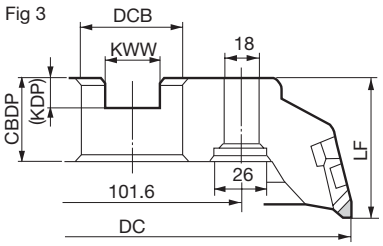


Fig 3



Body (SAM series)

Dimensions (mm)

	Cat. No.	Stock R	Stock L	Dia. DC	Height LF	Bore Dia. DCB	Mounting Depth CBDP	Keyway Width KWW	Keyway Depth KDP	Number of Teeth	Weight (kg)	Fig
Inch	**SAM080 R/L**			**80**	50	**25.4**	**25**	9.5	6	4	1.6	1
	SAM100 R/L			**100**	50	**31.75**	**32**	12.7	8	4	2.3	2
	125 R/L			**125**	63	**38.1**	**38**	15.9	10	5	3.7	2
	160 R/L			**160**	63	**50.8**	**38**	19.1	11	6	5.9	2
	SAM200 R/L			**200**	63	**47.625**	**38**	25.4	14	8	8.5	3
	250 R/L			**250**	63	**47.625**	**40**	25.4	14	10	114.3	3
	315 R/L			**315**	63	**47.625**	**40**	25.4	14	12	30.3	3

Inserts are sold separately.

● Refer to M55 for blades, parts and recommended cutting conditions.

It is possible to design the FAM/SAM series cutters in 2 teeth/inch or multi-teeth configurations.

SAM-E type

Rake Angle	Radial	0° to 2°
	Axial	+10°

5.7mm 90°

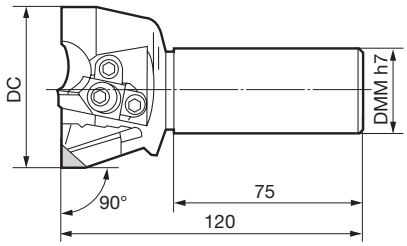
■ Features

Small Diameter Shank type SUMIDIA Cutter

- ● Excellent Sharpness and Durability:
  New blade shape with strong cutting edge and excellent sharpness.
- ● High Runout Precision:
  Fine pitch screw allows fine adjustment.
- ● High-Rigidity Body Design:
  Shallow blade grooves improve blade seating rigidity.

Body (SAM-E type)

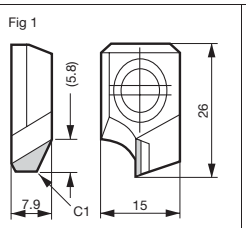
Dimensions (mm)

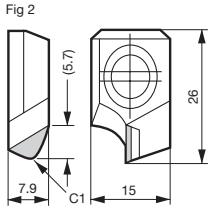


Cat. No.	Stock R	Stock L	Dia. DC	Shank Dia. DMM	Number of Teeth	Axial Rake	Radial Rake
SAM050E R/L			**50**	32	3	10°	0°
063E R/L			**63**	32	3	10°	1°
080E R/L			**80**	32	4	10°	2°

Inserts are sold separately.

Blade (SUMIDIA)





Cat. No.	DA150 R	DA150 L	DA2200 R	DA2200 L	Fig	Applicable Cutter
FAB R/L	▲		▲		1	FAM series
SAB R/L	▲		▲		2	SAM series

Parts

Tightening Bolt	Holding Piece	Adjustment Wedge	Double Screw	Double Screw	Wrench	Applicable Cutter
FADR	FAWR	FAAR*	WB7-15T	WB7F-15T	TT25	FAM series SAM series

* The adjustment wedge for SAM050ER/L and SAM063ER/L is SAAR.

Recommended Cutting Conditions

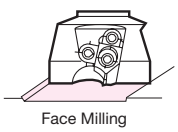
ISO	Work Materials	Machining Details	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy (AC)	Roughing	400-**1,700**-3000	0.05-**0.13**-0.20	DA150 DA2200
	Aluminum Alloy (ADC)	Finishing	400-**1,700**-3000	0.04-**0.10**-0.15	DA150 DA2200
	Aluminum Alloy (A390)	Finishing	300-**450**-600	0.04-**0.10**-0.15	DA150 DA2200

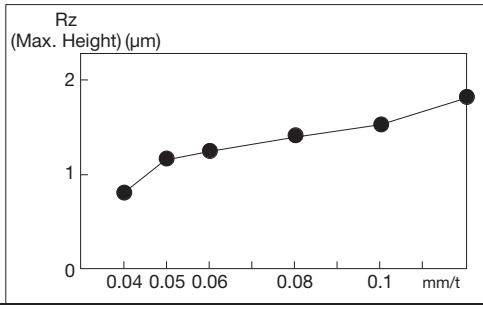
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.

Cutting Performance

● Surface Roughness

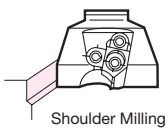
Work Material: AC2C vc=1,500m/min, ap=0.5mm
fz=0.04 to 0.15mm/t Dry

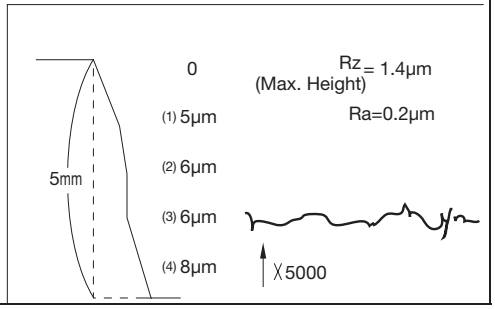

Face Milling



● Surface Roughness

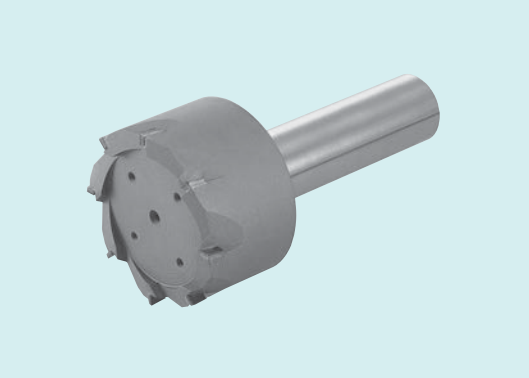
Work Material: AC2C vc=1,000m/min, ap=5.0mm
ae=0.1mm, fz=0.06mm/t Dry


Shoulder Milling



▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

DFE series



■ Features

- Supports small machines. Small diameter shank type cutter.
- Multiple brazed teeth for high feed milling.
- With excellent fracture resistance and sharpness, DA2200 is optimal for milling of aluminum and non-ferrous metals.
- Through-tool oil holes for high speed machining.

■ Body

Fig 1

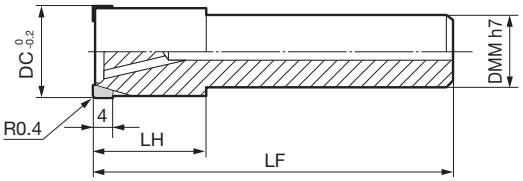
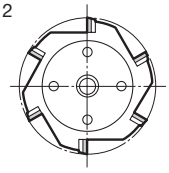


Fig 2



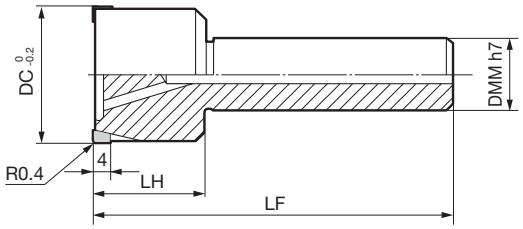
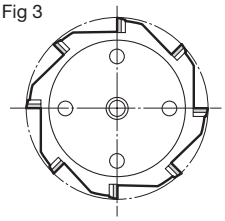
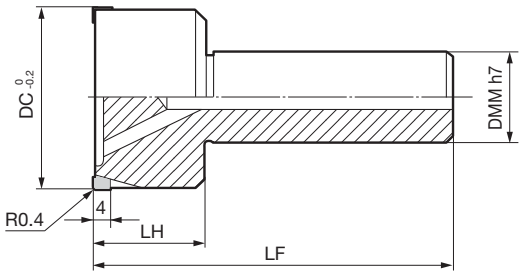


Fig 3



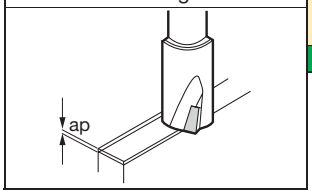


Dimensions (mm)

Cat. No.	DA2200	Dia. DC	Overall Length LF	Head LH	Shank Dia. DMM	Number of Teeth	Fig
DFE 4200GS	●	**20**	80	25	16	4	1
DFE 6250GS	●	**25**	80	25	16	6	2
6300GS	●	**30**	80	25	16	6	2
DFE 8400GS	●	**40**	80	25	16	8	3
8500GS	●	**50**	80	25	20	8	3

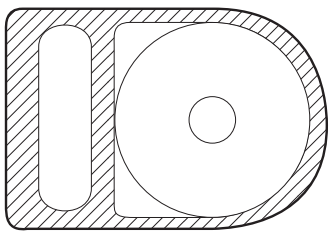
■ Recommended Cutting Conditions

Tooling



ISO	Work Material	Cutting Speed vc (m/min) Min. - **Optimum** - Max.	Feed Rate fz (mm/t) Min. - **Optimum** - Max.	Insert Grade
N	Aluminum Alloy	200-**800**-2,000	0.02-**0.05**-0.10	DA2200

■ Application Examples



Work Material	Cutting Conditions	Results
ADC12 Aluminum Alloy Motor Casing Part	Tool: DFE8400GS Cutting Conditions: vc = 1,500m/min n = 11,940min^{-1} fz = 0.03mm/t vf = 2,865mm/min ap = 0.5mm Wet	· Good machined surface as burrs do not occur. · More cutting teeth than indexable type cutters, and cycle time is much shorter.

SUMIDIA BINDERLESS Endmill series

VIDEO OF CUTTING

■ General Features

SUMIDIA BINDERLESS is polycrystalline diamond that directly binds nano-sized diamond particles with high strength without using any binders.
Harder than single-crystal diamond, it has no cleavability, enabling machining of hard brittle materials such as Cemented Carbide and making new machining methods possible.

■ Features

● Ideal for Finishing of Hard Brittle Materials Including Cemented Carbide
Provides excellent machined surface quality thanks to a sharp cutting edge and optimised edge treatment.

● Enables High-precision Machining and Achieves Long Tool Life
Maintains excellent dimensional tolerance for a long time thanks to the high contour accuracy of the cutting edge and excellent wear resistance of the diamond material.

SUMIDIA BINDERLESS Radius Endmills

NPDRS series

Radius r

For Surface Milling and Rounded Base Milling

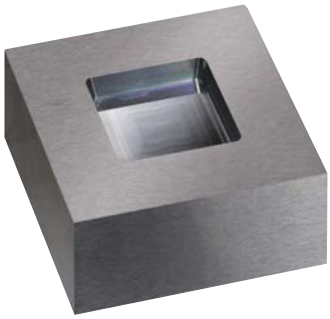
SUMIDIA BINDERLESS Ballnose Endmills

NPDBS series /NPDB series

Ballnose R

For Spherical Milling

● Pocketing



Work Material	: Carbide AF1 (Ultra-Fine Grained Carbide)
Tool Used	: NPDRS1100R005-030
Cutting Conditions	: 10mm × 10mm × Depth 2mm
	: n = 40,000min^{-1}, vf = 200mm/min
	pf = 0.005mm, Oil Mist
Surface Roughness	: Ra 0.015μm
Cutting Time	: 2 Hours

● Application to Optical Use (Fly-Eye Lens Mold)

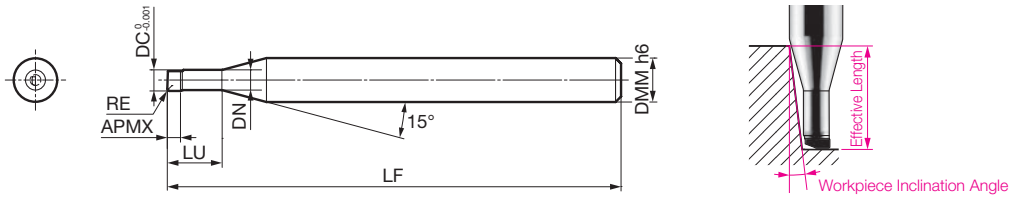
Work Material	: Carbide AF1 (Ultra-Fine Grained Carbide)
Tool	: Finishing NPDB 1050-020 (R0.5)
Roughing	: Diamond-Coated Endmill (R0.5)
Cutting Conditions	: n = 60,000min^{-1}, vf = 300mm/min
	pf = 0.005mm, Oil Mist
Surface Roughness	: Ra 0.015μm
Cutting Time	: Finishing 2 Hours 40 Minutes
	Roughing 55 Minutes

NPDRS type

Cemented Carbide | Hard Brittle Material

1 Flute | Binderless PCD | Radius r | Shoulder Milling | Face Milling | Profiling

Fig 1



Body

Dimensions (mm)

Cat. No.	Stock	Dia. DC	Corner Radius RE	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Effective Length for Workpiece Inclination Angle 0.5°	1°	1.5°	2°	3°	Wiper Edge	Fig
NPDRS 1020R002-006	●	0.2	0.02	0.1	0.6	40	0.175	4	0.63	0.65	0.67	0.70	0.75	No	1
1020R005-006	●	0.2	0.05	0.1	0.6	40	0.175	4	0.63	0.65	0.67	0.69	0.74	No	1
1030R002-010	●	0.3	0.02	0.15	1.0	40	0.27	4	1.04	1.08	1.11	1.15	1.24	No	1
1030R005-010	●	0.3	0.05	0.15	1.0	40	0.27	4	1.04	1.08	1.11	1.15	1.23	No	1
1050R005-015	●	0.5	0.05	0.25	1.5	40	0.47	4	1.56	1.61	1.66	1.72	1.84	No	1
NPDRS 1050R010-015	●	0.5	0.10	0.25	1.5	40	0.47	4	1.56	1.60	1.65	1.71	1.83	No	1
1100R005-030	●	1.0	0.05	0.55	3.0	40	0.95	4	3.14	3.24	3.35	3.46	3.72	No	1
1100R010-030	●	1.0	0.10	0.55	3.0	40	0.95	4	3.14	3.24	3.34	3.46	3.71	No	1
1100R020-030	●	1.0	0.20	0.55	3.0	40	0.95	4	3.14	3.23	3.33	3.44	3.69	No	1
1200R005-040	●	2.0	0.05	0.55	4.0	40	1.95	4	4.17	4.31	4.45	4.60	4.94	No	1
NPDRS 1200R010-040	●	2.0	0.10	0.55	4.0	40	1.95	4	4.17	4.30	4.44	4.60	4.93	No	1
1200R020-040	●	2.0	0.20	0.55	4.0	40	1.95	4	4.17	4.30	4.43	4.58	4.91	No	1

Grade: NPD10

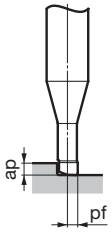
Identification Code

NPDR S 1 020 R002 - 006

Series Code	For Standard Finishing	No. of Flutes	Dia.	Corner Radius	Neck Length
NPDR	S	1	020	R002	006

Recommended Cutting Conditions

1. Use a machine with high accuracy for stable cutting.
2. Non-water soluble coolant recommended. Supply as a mist or external coolant. Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine specs and other conditions may vary.
5. The cutting parameters shown are for reference only. Adjust the cutting conditions to the desired machined surface finish.



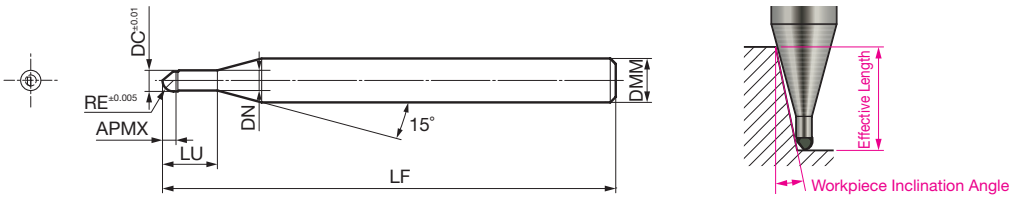
Work Material		Cemented Carbide			
DC (mm)	LU (mm)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	ap(mm)	pf(mm)
0.2	0.6	40,000	100	0.001	0.001
0.3	1.0	40,000	150	0.002	0.001
0.5	1.5	40,000	200	0.003	0.001
1.0	3.0	40,000	400	0.005	0.003
2.0	4.0	40,000	600	0.010	0.005

NPDBS type

Cemented Carbide | Hard Brittle Material

1 Flute | Binderless PCD | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body (for Standard Finishing)

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Effective Length for Workpiece Inclination Angle 0.5°	1°	1.5°	2°	3°	Fig
NPDBS 1010-004	●	**0.1**	**0.2**	0.1	0.4	40	0.18	4	0.42	0.43	0.44	0.46	0.48	1
1020-008	●	**0.2**	**0.4**	0.2	0.8	40	0.38	4	0.83	0.85	0.87	0.90	0.95	1
1030-010	●	**0.3**	**0.6**	0.3	1.0	40	0.58	4	1.03	1.06	1.08	1.11	1.17	1
1050-020	●	**0.5**	**1.0**	0.5	2.0	40	0.95	4	2.10	2.15	2.20	2.26	2.39	1
1100-030	●	**1.0**	**2.0**	1.0	3.0	40	1.95	4	3.11	3.18	3.25	3.33	3.51	1

Grade: NPD10

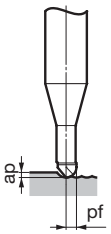
Identification Code

NPDB S 1 010 - 004

- NPDB: Series Code
- S: For Standard Finishing
- 1: No. of Flutes
- 010: Ballnose Radius
- 004: Neck Length

Recommended Cutting Conditions

1. Use a machine with high accuracy for stable cutting.
2. Non-water soluble coolant recommended. Supply as a mist or external coolant. Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine specs and other conditions may vary.
5. The cutting parameters shown are for reference only. Adjust the cutting conditions to the desired machined surface finish.



Work Material		Cemented Carbide			
RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap(mm)	pf(mm)
0.1	0.4	40,000	100	0.001	0.001
0.2	0.8	40,000	150	0.002	0.001
0.3	1.0	40,000	200	0.003	0.001
0.5	2.0	40,000	400	0.005	0.003
1.0	3.0	40,000	600	0.010	0.005

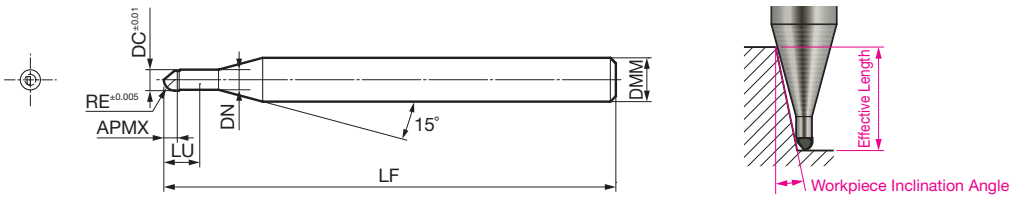
* Radius accuracy inspection report is included inside the case. ☞I135
* Long neck type is also available depending on the size. Please consult us separately.

NPDB type

Cemented Carbide | Hard Brittle Material

1 Flute | Binderless PCD | Ballnose R | Shoulder Milling | Face Milling | R-Grooving | Profiling

Fig 1



Body (for Precise Finishing)

Dimensions (mm)

Cat. No.	Stock	Ballnose Radius RE	Dia. DC	Cutting Edge Length APMX	Neck Length LU	Overall Length LF	Neck Dia. DN	Shank Dia. DMM	Effective Length for Workpiece Inclination Angle 0.5°	1°	1.5°	2°	3°	Fig
NPDB 1010-004	●	**0.1**	**0.2**	0.1	0.4	40	0.18	4	0.42	0.43	0.44	0.46	0.48	1
1020-008	●	**0.2**	**0.4**	0.2	0.8	40	0.38	4	0.83	0.85	0.87	0.90	0.95	1
1030-010	●	**0.3**	**0.6**	0.3	1.0	40	0.58	4	1.03	1.06	1.08	1.11	1.17	1
1050-020	●	**0.5**	**1.0**	0.5	2.0	40	0.95	4	2.10	2.15	2.20	2.26	2.39	1
1100-030	●	**1.0**	**2.0**	1.0	3.0	40	1.95	4	3.11	3.18	3.25	3.33	3.51	1

Grade: NPD10

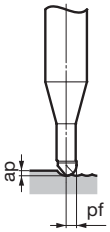
Identification Code

NPDB 1 010 - 004

Series Code	No. of Flutes	Ballnose Radius	Neck Length
NPDB	1	010	004

Recommended Cutting Conditions

1. Use a machine with high accuracy for stable cutting.
2. Non-water soluble coolant recommended. Supply as a mist or external coolant.
   Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
3. Shorten overhang as much as possible.
4. Adjust cutting conditions as necessary as machine specs and other conditions may vary.
5. The cutting parameters shown are for reference only. Adjust the cutting conditions to the desired machined surface finish.



Work Material		Cemented Carbide			
RE (mm)	LU (mm)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)	ap (mm)	pf (mm)
0.1	0.4	40,000	100	0.001	0.001
0.2	0.8	40,000	150	0.002	0.001
0.3	1.0	40,000	200	0.003	0.001
0.5	2.0	40,000	400	0.005	0.003
1.0	3.0	40,000	600	0.010	0.005

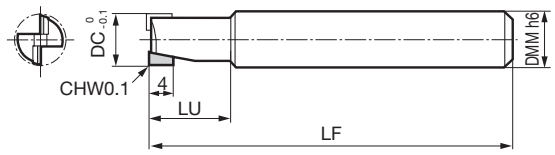
* Radius accuracy inspection report is included inside the case. I135
* Long neck type is also available depending on the size. Please consult us separately.

DFE series

Aluminum Alloy | Copper Alloy | Graphite

2 Flutes | PCD | Shoulder Milling | Face Milling

Fig 1



Body

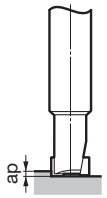
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Neck Length LU	Overall Length LF	Shank Dia. DMM	Fig
DFE 2040S	●	**4.0**	15	50	6	1
2050S	●	**5.0**	15	50	6	1
2080S	●	**8.0**	15	60	10	1
2090S	●	**9.0**	15	70	10	1
2100S	●	**10.0**	15	70	10	1

Grade: DA2200

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Face Milling (2 Flutes)

Work Material / Cutting Conditions		Aluminum Alloy Copper Alloy	
DC(mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.0		40,000	4,000
5.0		32,000	3,200
8.0		20,000	2,000
9.0		17,800	1,780
10.0		16,000	1,600
Standard Depth of Cut	ap	0.4DC	

4 Flutes | PCD | Shoulder Milling | Face Milling

Fig 1

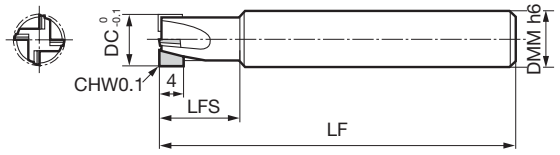
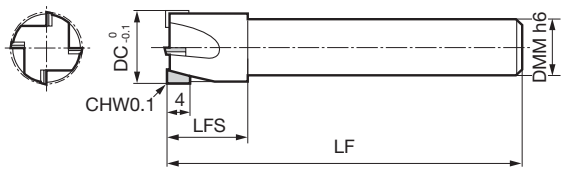


Fig 2



Body

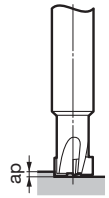
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Neck Length LFS	Overall Length LF	Shank Dia. DMM	Fig
DFE 4090S	●	**9.0**	15	70	10	1
4100S	●	**10.0**	15	70	10	1
4130GS	●	**13.0**	15	70	10	2

Grade: DA2200

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



Face Milling (4 Flutes)

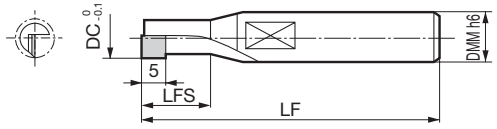
Work Material / Cutting Conditions		Aluminum Alloy Copper Alloy	
DC(mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)
9.0		17,800	3,560
10.0		16,000	3,200
13.0		12,300	2,460
Standard Depth of Cut	ap	0.4DC	

DAE series

Aluminum Alloy | Copper Alloy | Graphite

1 Flute | PCD | Shoulder Milling | Face Milling

Fig 1



Body

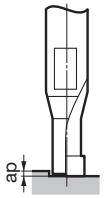
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Neck Length LFS	Overall Length LF	Shank Dia. DMM	Fig
DAE 1040	●	**4.0**	10	45	6	1
1050	●	**5.0**	12	50	6	1

Grade: DA200

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.

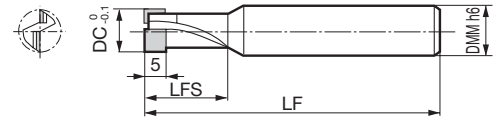


Face Milling (1 Flutes)

Work Material / Cutting Conditions		Aluminum Alloy Copper Alloy	
DC(mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)
4.0		6,000	210
5.0		5,000	175
Standard Depth of Cut	ap	0.4DC	

2 Flutes | PCD | Shoulder Milling | Face Milling

Fig 1



Body (2 Flutes)

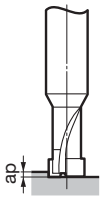
Dimensions (mm)

Cat. No.	Stock	Dia. DC	Neck Length LFS	Overall Length LF	Shank Dia. DMM	Fig
DAE 2060	●	**6.0**	20	50	6	1
2070	●	**7.0**	20	60	8	1
2080	●	**8.0**	20	60	8	1
2090	●	**9.0**	25	71	10	1
2100	●	**10.0**	25	71	10	1
DAE 2110	●	**11.0**	25	75	12	1
2120	●	**12.0**	25	75	12	1

Grade: DA200

Recommended Cutting Conditions

1. If the machine cannot achieve the recommended spindle speed, please use the maximum spindle speed available.
2. If cutting noise and vibration occur, please reduce the cutting conditions accordingly.



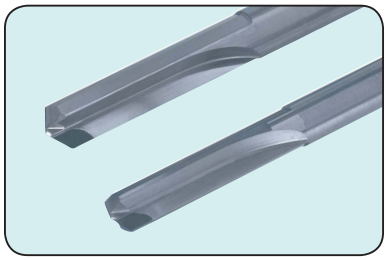
Face Milling (2 Flutes)

Work Material / Cutting Conditions		Aluminum Alloy Copper Alloy	
DC(mm)		Spindle Speed (min^{-1})	Feed Rate (mm/min)
6.0		6,400	580
7.0		5,500	500
8.0		5,400	500
9.0		5,300	480
10.0		4,800	440
11.0		4,400	400
12.0		4,000	360
Standard Depth of Cut	ap	0.4DC	

DAL/DDL series

Aluminum Alloy | Composite CFRP

PCD 3D



From General to High Precision Drilling of Aluminum Alloys

- High precision DAL series is able to produce holes of IT Class of 7 to 8.
- General DDL series is able to produce holes of IT class 11 to 12, mainly for pre-tap hole drilling.

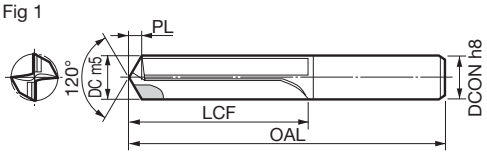
DAL series

*Refer to N36 for the tolerance of m5, h8 Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	
	Roughing	

Cat. No.	DA2200	Dia. (Shank Dia.) DC(DCON)	Flute Length LCF	Overall Length OAL	Tip PL	Fig
DAL 0500H to 0600H		ø5 ≤ DC ≤ ø6	31.6	81.6	1.6	1
0601H to 0700H		ø6 < DC ≤ ø7	36.9	91.9	1.9	1
0701H to 0800H		ø7 < DC ≤ ø8	37.2	92.2	2.2	1
0801H to 0900H		ø8 < DC ≤ ø9	42.5	102.5	2.5	1
0901H to 1000H		ø9 < DC ≤ ø10	42.8	102.8	2.8	1
1001H to 1100H		ø10 < DC ≤ ø11	53.1	113.1	3.1	1
1101H to 1200H		ø11 < DC ≤ ø12	53.4	113.4	3.4	1

Fig 1



Ordering numbers should be handled according to this example: ø6.05mm drill → DAL0605H.

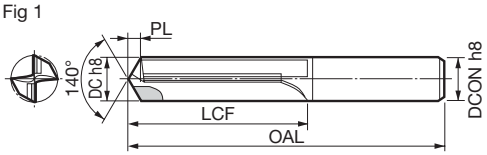
DDL series

*Refer to N36 for the tolerance of h8 Dimensions (mm)

Grade Classification		SUMIDIA
Process	High-speed/Light Cutting	N
	General-purpose	
	Roughing	

Cat. No.	DA2200	Dia. (Shank Dia.) DC(DCON)	Flute Length LCF	Overall Length OAL	Tip PL	Fig
DDL 050V to 060V		ø5 ≤ DC ≤ ø6	31.5	81.0	1.0	1
061V to 070V		ø6 < DC ≤ ø7	36.2	91.2	1.2	1
071V to 080V		ø7 < DC ≤ ø8	36.4	91.4	1.4	1
081V to 090V		ø8 < DC ≤ ø9	41.6	101.6	1.6	1
091V to 100V		ø9 < DC ≤ ø10	41.7	101.7	1.7	1
101V to 110V		ø10 < DC ≤ ø11	51.9	111.9	1.9	1
111V to 120V		ø11 < DC ≤ ø12	52.1	112.1	2.1	1

Fig 1



Ordering numbers should be handled according to this example: ø10.5mm drill → DDL105V.

Recommended Cutting Conditions

(n: Spindle Speed min^{-1} vc: Cutting Speed m/min f: Feed Rate mm/rev)

Diameter DC (mm)	Cutting Conditions	DAL series	DDL series	Depth of Cut	Oil
ø8.0	n	4,000	8,000	L/D= Below 3	Emulsion type
	vc	80 - **100** - 150	150 - **200** - 250		
	f	0.05 - **0.1** - 0.15	0.1 - **0.15** - 0.25		
ø12.0	n	2,700	5,300		
	vc	80 - **100** - 150	150 - **200** - 250		
	f	0.08 - **0.13** - 0.2	0.15 - **0.2** - 0.3		

Min. - **Optimum** - Max.

Important Notes

- When using DAL series for high-precision machining, select a high rigidity machine and high precision holder.
- Supply coolant generously at the entrance of the hole.

SUMICRYSTAL M

M65 to M71

SUMICRYSTAL

SUMICRYSTAL M66
SUMICRYSTAL PD/PDX M67
SUMICRYSTAL UP M68
SUMICRYSTAL UP (Half Cut) M69
SUMICRYSTAL UPT M70
SUMICRYSTAL CD M71

■ General Features

SUMICRYSTAL is the world's first commercially available large single-crystal synthetic diamond, developed by Sumitomo.
Thorough quality control has achieved stable quality, making SUMICRYSTAL ideal as an industrial material.

■ Production Method

The synthetic single-crystal diamond SUMICRYSTAL is synthesised in a super high pressure chamber from 5 to 6GPa and high temperatures from 1,300 to 1,600°C. The temperature difference between the raw carbon and the seed crystal is used to grow the diamond on the seed crystal. Through this stringent control of pressures and temperatures, a more stable structure with minimal impurities can be obtained.

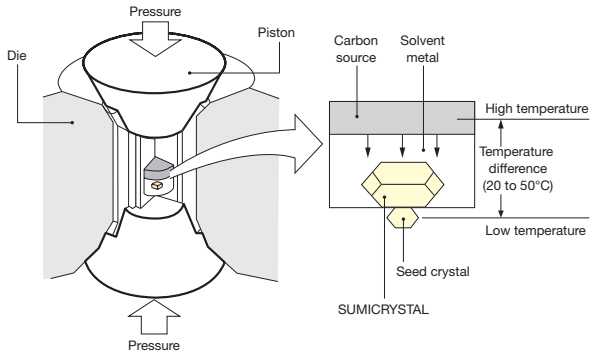
■ Properties

SUMICRYSTAL has 4 main advantages over natural diamond.

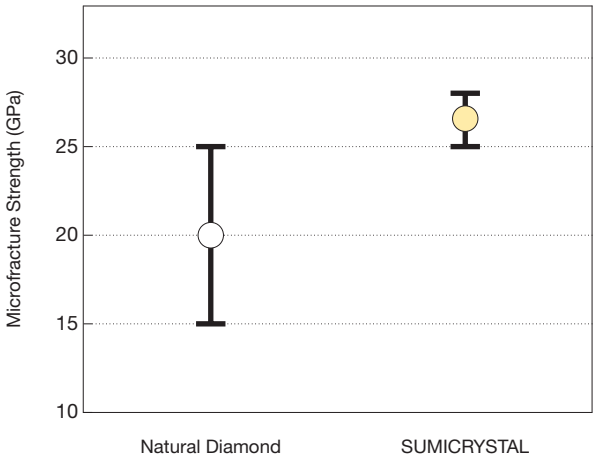
1) Structural advantage: Natural diamond is rounded and the crystal orientation is difficult to determine with the naked eye. SUMICRYSTAL, however, has a distinct crystal face which makes the identification much easier.
2) Uniformity: Due to the strictly controlled conditions in which the crystals are grown, uniform quality is obtained consistently.
3) Availability: Unlike the limited supply of natural diamonds, SUMICRYSTAL can be mass produced.
4) SUMICRYSTAL diamond type Ib, which is used for tools, has mechanical and thermal properties equal to or even greater than natural diamond, while containing small amounts of nitrogen impurities.

● Inside a super high pressure chamber

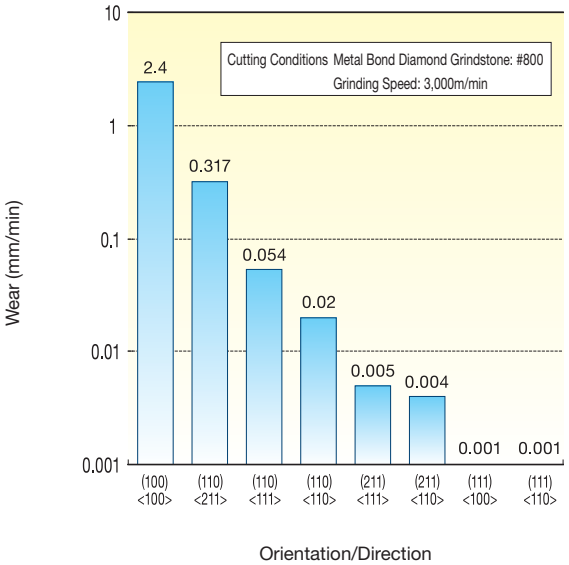
Synthetic Conditions
Pressure: 5 to 6GPa
Temperature: 1,300 to 1,600°C



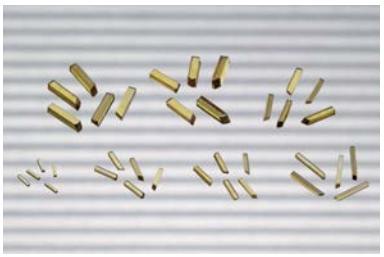
● Microfracture Strength of Synthetic Diamond



● Orientation and Wear Resistance



PD/PDX



■ General Features

SUMICRYSTAL PD and PDX are single-crystal synthetic diamonds processed into thin prism shapes for use as dresser blanks. Their stable performance and long tool life improve dressing precision.

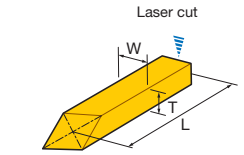
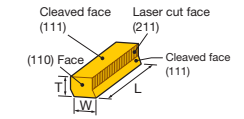
SUMICRYSTAL PD

■ Features

● Revolutionary elongated shape
(1) Improves holding power and prevents falling out.
(2) Consistent cross-section prevents deterioration.
(3) Uniform crystal orientation promotes stable tool life.

■ Standard Cat. No. (PD)

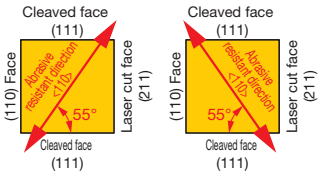
Dimensions (mm)

Shape	Cat. No.	Stock	T	W	L
PD  · Dimension L is the distance between the centre points of both ends. · Both upper and lower (111) faces are cleaved.	PD 0220	●	0.2±0.05	0.2±0.05	2.0 to 2.5
	PD 0420	●	0.4±0.05	0.4±0.05	2.0 to 2.5
	PD 0630K	●	0.6±0.1	0.6±0.1	3.0 to 4.0
	PD 0640K	●			4.0 to 5.0
	PD 0650K	●			5.0 up
	PD 0830K	●	0.8±0.1	0.8±0.1	3.0 to 4.0
	PD 0840K	●			4.0 to 5.0
	PD 0850K	●			5.0 up
	PD 1130K	●	1.1±0.1	1.1±0.1	3.0 to 4.0
	PD 1140K	●			4.0 to 5.0
PD-T  Single cleaved side face with pre-determined abrasive resistant direction.	PD 0630TK	●	0.6±0.1	0.6±0.1	3.0 to 4.0
	PD 0640TK	●			4.0 to 5.0
	PD 0830TK	●	0.8±0.1	0.8±0.1	3.0 to 4.0
	PD 0840TK	●			4.0 to 5.0
	PD 1130TK	●	1.1±0.1	1.1±0.1	3.0 to 4.0
	PD 1140TK	●			4.0 to 5.0

*1 Sizes other than those indicated above can be ordered.
*2 These products may have fine impurities within Sumitomo's prescribed range.
*3 The laser cut faces among other product areas may have chipping within Sumitomo's prescribed range.

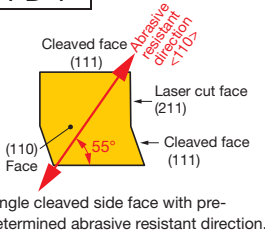
■ PD Crystal Orientation

PD



· The two types above both exist in the wear-resistant direction.

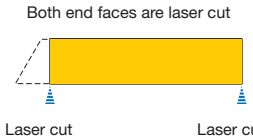
PD-T



· Single cleaved side face with pre-determined abrasive resistant direction.

■ KK type

Apart from the standard items listed above, PD is also available in the KK type with both end faces laser-cut.



· When ordering, please include "K" behind the standard catalogue no. (Example: PD○○○○KK, PD○○○○TKK)

· PD0220 and PD0420 are not available in the KK type.

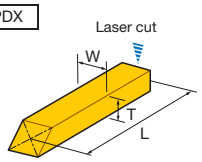
SUMICRYSTAL PDX

■ Features

● Compared to SUMICRYSTAL PD, the product has different face crystal orientation.
(1) Crystal orientation (211) provides better tool life than PD blanks.
(2) Parallel abrasive resistant faces (111) facilitate blank setting during manufacturing of dressers.

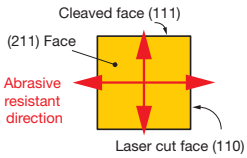
■ Standard Cat. No. (PDX)

Dimensions (mm)

Shape	Cat. No.	Stock	T	W	L
PDX  · Dimension L is the distance between the centre points of both ends. · Both upper and lower (111) faces are cleaved.	PDX 0220	●	0.2±0.05	0.2±0.05	2.0±0.1
	PDX 0320	●	0.3±0.05	0.3±0.05	2.0±0.1
	PDX 0420	●	0.4±0.05	0.4±0.05	2.0±0.1
	PDX 0630	●	0.6±0.1	0.6±0.1	3.0±0.5
	PDX 0640	●			4.0±0.5
	PDX 0830	●	0.8±0.1	0.8±0.1	3.0±0.5
	PDX 0840	●			4.0±0.5
	PDX 1130	●	1.1±0.1	1.1±0.1	3.0±0.5
	PDX 1140	●			4.0±0.5

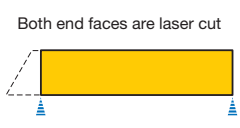
*1 Sizes other than those indicated above can be ordered.
*2 These products may have fine impurities within Sumitomo's prescribed range.
*3 The laser cut faces among other product areas may have chipping within Sumitomo's prescribed range.

■ PDX Crystal Orientation



■ K type

Apart from the standard items listed above, PDX is also available in the K type with both end faces laser-cut.

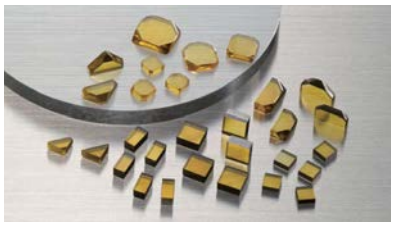


· When ordering, please include "K" behind the standard catalogue no. (Example: PDX○○○○K)

· PDX0220, PDX0320 and PDX0420 are not available in the K type.

The orientation in the shape diagram is a typical value, with deviations in actual products.

UP



■ General Features

Of today's sophisticated cutting-edge technologies, ultra-precision machining processes such as those used for optical element molds are seeing particularly rapid development.
SUMICRYSTAL UP blanks have high performance and reliability, making them optimally suited to these applications.

■ Features

(1) High quality with very low variance.
Stable wear resistance with excellent resistance to cutting edge chipping.
(2) Minimal stock removal during cutting edge formation.
Uniform shape facilitates cutting edge formation.

■ Standard type

Rectangular parallel type with 6 (100) faces.

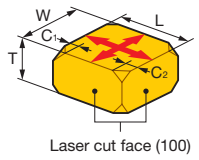
■ Economy type

Peripheral growth faces and top (100) are not cut. Benefits include large volume and low cost.

■ Standard Cat. No. (Standard type)

Dimensions (mm)

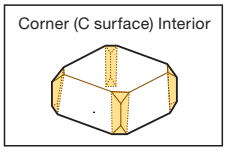
Shape	Cat. No.	Stock	L	W	C_1,C_2	T
UP Top and Bottom Surfaces: Ground Surface	**UP 282512**		2.8 to 3.5	2.5 to 3.5	up to 0.8	1.2±0.1
	UP 282515		2.8 to 3.5	2.5 to 3.5	up to 0.8	1.5±0.1
	UP 303015		3.0 to 3.5	3.0 to 3.5	up to 0.3	1.5±0.1
	UP 301415		3.0 to 3.5	1.4 to 1.7	up to 0.3	1.5±0.1
	UP 333014		3.3 to 4.0	3.0 to 4.0	up to 0.9	1.4±0.1
	UP 333017		3.3 to 4.0	3.0 to 4.0	up to 0.9	1.7±0.1
	UP 353514		3.5 to 4.0	3.5 to 4.0	up to 0.4	1.4±0.1
	UP 353517		3.5 to 4.0	3.5 to 4.0	up to 0.4	1.7±0.1
	UP 351717		3.5 to 4.0	1.7 to 2.0	up to 0.4	1.7±0.1



Laser cut face (100)

The red arrows indicate the direction for easy grinding.
Crystal face orientations are all (100) except the corners.

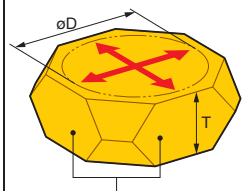
*1 Sizes other than those indicated above can be ordered.
*2 These products may have fine impurities, chipping, etc. within Sumitomo's prescribed range.
*3 Impurities, cracks, etc. outside the inspection range may be present at the product corner (C surface) interior.



■ Standard Cat. No. (Economy type)

Dimensions (mm)

Shape	Cat. No.	Stock	øD Minimum guaranteed dimensions	T
UP Economy type	**UP 2010**		2.0	$1.0^{+0.2}_{-0.0}$
	UP 2012		2.0	$1.2^{+0.3}_{-0.0}$
	UP 2510		2.5	$1.0^{+0.2}_{-0.0}$
	UP 2512		2.5	$1.2^{+0.3}_{-0.0}$
	UP 2515		2.5	$1.5^{+0.3}_{-0.0}$
	UP 3010		3.0	$1.0^{+0.2}_{-0.0}$
	UP 3012		3.0	$1.2^{+0.3}_{-0.0}$
	UP 3015		3.0	$1.5^{+0.3}_{-0.0}$
	UP 3510		3.5	$1.0^{+0.2}_{-0.0}$
	UP 3512		3.5	$1.2^{+0.3}_{-0.0}$
	UP 3515		3.5	$1.5^{+0.3}_{-0.0}$
	UP 4010		4.0	$1.0^{+0.2}_{-0.0}$
	UP 4012		4.0	$1.2^{+0.3}_{-0.0}$
	UP 4015		4.0	$1.5^{+0.3}_{-0.0}$
	UP 4020		4.0	$2.0^{+0.3}_{-0.0}$
	UP 4510		4.5	$1.0^{+0.2}_{-0.0}$
	UP 4512		4.5	$1.2^{+0.3}_{-0.0}$
	UP 4515		4.5	$1.5^{+0.3}_{-0.0}$
	UP 4520		4.5	$2.0^{+0.3}_{-0.0}$
	UP 5010		5.0	$1.0^{+0.2}_{-0.0}$
	UP 5012		5.0	$1.2^{+0.3}_{-0.0}$
	UP 5015		5.0	$1.5^{+0.3}_{-0.0}$
	UP 5020		5.0	$2.0^{+0.3}_{-0.0}$



Growth Surface

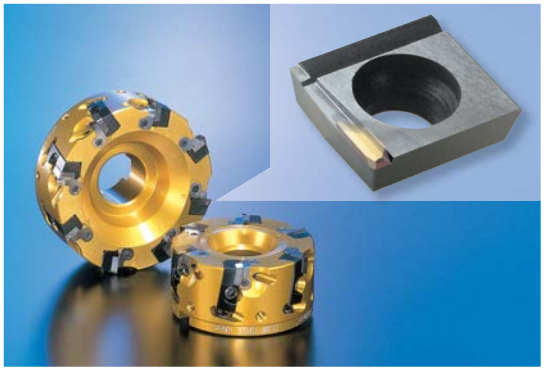
Top Surface: Growth Surface or Ground Surface
Bottom Surface: Ground Surface

The red arrows indicate the direction for easy grinding.

*1 Sizes other than those indicated above can be ordered.
*2 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present in the minimum guaranteed dimensions of these products.
*3 Impurities, chipping, etc. outside the inspection range may be present outside the minimum guaranteed dimensions of these products.
*4 Some products have ground top surfaces.

● Cutting Tools Using SUMICRYSTAL UP

Wiper Insert for High-efficiency Cutter for Aluminum Alloy RF type



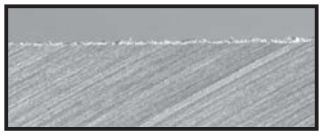
* This product was jointly developed with A.L.M.T. Corp.

SUMICRYSTAL SC10 (Wiper Insert)

H241 M51

· Utilises Sumitomo Electric Hardmetal's SUMICRYSTAL as a cutting edge. SUMICRYSTAL is a single-crystal diamond produced using a unique super-high-pressure technology.
· SUMICRYSTAL can maintain its edge sharpness better than sintered diamonds, greatly reducing burr formation.

SUMICRYSTAL (Single-crystal Diamond)
SC10 Wiper Blade Machined Surface



SUMIDIA (Sintered Diamond)
Wiper Blade Machined Surface

The orientation in the shape diagram is a typical value, with deviations in actual products.

UP (Half-Cut Product)

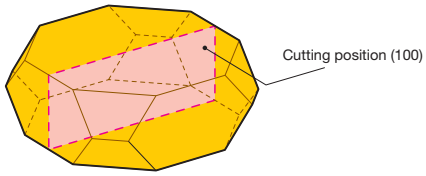
■ General Features

SUMICRYSTAL UP Half Cut products are materials for holders consisting of the UP Economy type material cut in half along the (100) or (110) faces.

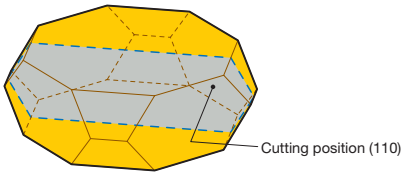
■ Features

(1) Machining loss is reduced because volume removed by grinding during tool production is reduced.
(2) Similar shape to the completed tool, reducing material costs.
(3) The cut surface is a smooth laser surface.

■ Type cut along (100) face



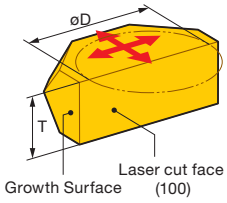
■ Type cut along (110) face



■ Standard Cat. No. (Cutting Position 100 type)

Dimensions (mm)

Shape	Cat. No.	Stock	øD Minimum guaranteed dimensions	T
UP Half-Cut (100) type	UP 2010 (100) 1/2		2.0	$1.0^{+0.2}_{-0.0}$
	UP 2012 (100) 1/2		2.0	$1.2^{+0.3}_{-0.0}$
	UP 2510 (100) 1/2		2.5	$1.0^{+0.2}_{-0.0}$
	UP 2512 (100) 1/2		2.5	$1.2^{+0.3}_{-0.0}$
	UP 2515 (100) 1/2		2.5	$1.5^{+0.3}_{-0.0}$
	UP 3010 (100) 1/2		3.0	$1.0^{+0.2}_{-0.0}$
	UP 3012 (100) 1/2		3.0	$1.2^{+0.3}_{-0.0}$
	UP 3015 (100) 1/2		3.0	$1.5^{+0.3}_{-0.0}$
	UP 3510 (100) 1/2		3.5	$1.0^{+0.2}_{-0.0}$
	UP 3512 (100) 1/2		3.5	$1.2^{+0.3}_{-0.0}$
	UP 3515 (100) 1/2		3.5	$1.5^{+0.3}_{-0.0}$
	UP 4010 (100) 1/2		4.0	$1.0^{+0.2}_{-0.0}$
	UP 4012 (100) 1/2		4.0	$1.2^{+0.3}_{-0.0}$
	UP 4015 (100) 1/2		4.0	$1.5^{+0.3}_{-0.0}$
	UP 4020 (100) 1/2		4.0	$2.0^{+0.3}_{-0.0}$
	UP 4510 (100) 1/2		4.5	$1.0^{+0.2}_{-0.0}$
	UP 4512 (100) 1/2		4.5	$1.2^{+0.3}_{-0.0}$
	UP 4515 (100) 1/2		4.5	$1.5^{+0.3}_{-0.0}$
	UP 4520 (100) 1/2		4.5	$2.0^{+0.3}_{-0.0}$
	UP 5010 (100) 1/2		5.0	$1.0^{+0.2}_{-0.0}$
	UP 5012 (100) 1/2		5.0	$1.2^{+0.3}_{-0.0}$
	UP 5015 (100) 1/2		5.0	$1.5^{+0.3}_{-0.0}$
	UP 5020 (100) 1/2		5.0	$2.0^{+0.3}_{-0.0}$



Top Surface: Growth Surface or Ground Surface
Bottom Surface: Ground Surface

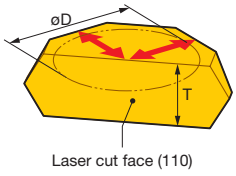
The red arrows indicate the direction for easy grinding.

*1 Sizes other than those indicated above can be ordered.
*2 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present in the minimum guaranteed dimensions of these products.
*3 Impurities, chipping, etc. outside the inspection range may be present outside the minimum guaranteed dimensions of these products.

■ Standard Cat. No. (Cutting Position 110 type)

Dimensions (mm)

Shape	Cat. No.	Stock	øD Minimum guaranteed dimensions	T
UP Half-Cut (110) type	UP 2010 (110) 1/2		2.0	$1.0^{+0.2}_{-0.0}$
	UP 2012 (110) 1/2		2.0	$1.2^{+0.3}_{-0.0}$
	UP 2510 (110) 1/2		2.5	$1.0^{+0.2}_{-0.0}$
	UP 2512 (110) 1/2		2.5	$1.2^{+0.3}_{-0.0}$
	UP 2515 (110) 1/2		2.5	$1.5^{+0.3}_{-0.0}$
	UP 3010 (110) 1/2		3.0	$1.0^{+0.2}_{-0.0}$
	UP 3012 (110) 1/2		3.0	$1.2^{+0.3}_{-0.0}$
	UP 3015 (110) 1/2		3.0	$1.5^{+0.3}_{-0.0}$
	UP 3510 (110) 1/2		3.5	$1.0^{+0.2}_{-0.0}$
	UP 3512 (110) 1/2		3.5	$1.2^{+0.3}_{-0.0}$
	UP 3515 (110) 1/2		3.5	$1.5^{+0.3}_{-0.0}$
	UP 4010 (110) 1/2		4.0	$1.0^{+0.2}_{-0.0}$
	UP 4012 (110) 1/2		4.0	$1.2^{+0.3}_{-0.0}$
	UP 4015 (110) 1/2		4.0	$1.5^{+0.3}_{-0.0}$
	UP 4020 (110) 1/2		4.0	$2.0^{+0.3}_{-0.0}$
	UP 4510 (110) 1/2		4.5	$1.0^{+0.2}_{-0.0}$
	UP 4512 (110) 1/2		4.5	$1.2^{+0.3}_{-0.0}$
	UP 4515 (110) 1/2		4.5	$1.5^{+0.3}_{-0.0}$
	UP 4520 (110) 1/2		4.5	$2.0^{+0.3}_{-0.0}$
	UP 5010 (110) 1/2		5.0	$1.0^{+0.2}_{-0.0}$
	UP 5012 (110) 1/2		5.0	$1.2^{+0.3}_{-0.0}$
	UP 5015 (110) 1/2		5.0	$1.5^{+0.3}_{-0.0}$
	UP 5020 (110) 1/2		5.0	$2.0^{+0.3}_{-0.0}$



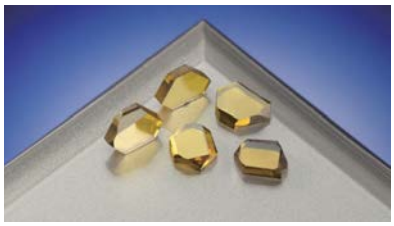
Top Surface: Growth Surface or Ground Surface
Bottom Surface: Ground Surface

The red arrows indicate the direction for easy grinding.

*1 Sizes other than those indicated above can be ordered.
*2 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present in the minimum guaranteed dimensions of these products.
*3 Impurities, chipping, etc. outside the inspection range may be present outside the minimum guaranteed dimensions of these products.

The orientation in the shape diagram is a typical value, with deviations in actual products.

UPT



■ General Features

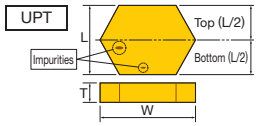
SUMICRYSTAL UPT is a material for bites with a 2-point surface ((110) surface) as the main surface.

■ Features

(1) 2-point surface ((110) face) enables use for the same applications as with bites using conventional natural diamonds.
(2) Distinctive shape minimises the volume removed to make the cutting edge, enabling efficient machining.

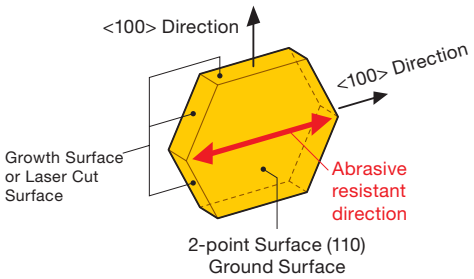
■ Standard Items

Dimensions (mm)

Shape	Cat. No.	Stock	W	L	T
	**UPT 2510**		≥ 2.5	≥ 2.5	$1.0^{\pm 0.1}$
	UPT 2512				$1.2^{\pm 0.1}$
	UPT 3010		≥ 3.0	≥ 2.5	$1.0^{\pm 0.1}$
	UPT 3012				$1.2^{\pm 0.1}$

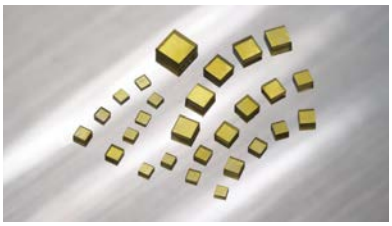
*1 Sizes other than those indicated above can be ordered.
*2 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present at the top (L/2).
*3 Impurities, chipping, etc. outside the inspection range may be present at the bottom (L/2).

■ UPT Crystal Orientation



The orientation in the shape diagram is a typical value, with deviations in actual products.

CD



■ General Features

SUMICRYSTAL CD has optimised crystal orientation and shape as a material for wire drawing dies. Realising excellent performance through high quality and stability.

■ Features

(1) High quality with very low variance.
High-quality crystal with minimal impurities, chipping and distortion is used to achieve high, stable wear resistance. It also eliminates the need for inspection and selection of raw stones as required for natural diamond.

(2) High fracture strength
Resistant to fracture and cracking during wire drawing.

(3) Accurate crystal orientation
(111) is used on the top and bottom surface, limiting crystal misorientation, which causes variance in tool life, to within 1°.

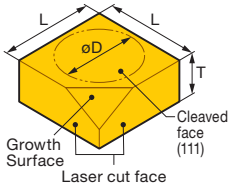
(4) No grinding needed for top and bottom surface
The top and bottom surface are cleaved to form parallel surfaces, eliminating the need for grinding of the top and bottom surface.

■ Standard type

The outside is machined by laser, achieving a consistent shape for easy setting. Mounting pressure is applied evenly, ensuring sufficient strength even for small volume. Ideal for applications with limited dimensions, such as nozzles and wire guides.

■ Standard Items

Dimensions (mm)

Shape	Cat. No.	Stock	øD Minimum guaranteed dimensions	L	T
 The laser cutting surface orientation is undetermined.	**CD 1006(111)**	●	0.9	$1.0^{\pm0.1}$	$0.6^{\pm0.1}$
	CD 1008(111)	●	0.9	$1.0^{\pm0.1}$	$0.8^{\pm0.1}$
	CD 1210(111)	●	1.1	$1.2^{\pm0.1}$	$1.0^{\pm0.1}$
	CD 1411(111)	●	1.3	$1.4^{\pm0.1}$	$1.1^{\pm0.1}$
	CD 1512(111)	●	1.4	$1.5^{\pm0.1}$	$1.2^{\pm0.1}$
	CD 1814(111)		1.7	$1.8^{\pm0.1}$	$1.4^{\pm0.1}$
	CD 2016(111)		1.9	$2.0^{\pm0.1}$	$1.6^{\pm0.1}$
	CD 2318(111)		2.2	$2.3^{\pm0.1}$	$1.8^{\pm0.1}$
	CD 2520(111)		2.4	$2.5^{\pm0.1}$	$2.0^{\pm0.1}$

*1 Sizes other than those indicated above can be ordered.
*2 Dimension L is guaranteed on the small side surface of the volume.
*3 Cleaved steps within Sumitomo's prescribed range may be present on the cleaved surface.
*4 Fine impurities, chipping, etc. within Sumitomo's prescribed range may be present in the minimum guaranteed dimensions of these products.
*5 Impurities, chipping, etc. outside the inspection range may be present outside the minimum guaranteed dimensions of these products.

The orientation in the shape diagram is a typical value, with deviations in actual products.

Parts N

N1 to N8

Screws ····· N2
Screws / Eccentric Pins / Lever Pins / Shims ····· N4
Shims ····· N5
Shims / Seats ····· N6
Retaining Rings / Pins / Nuts / Drawing Pins / Wrenches ··· N7
Wrenches ····· N8

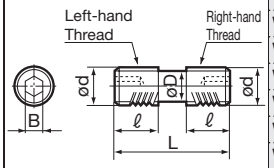
Stock Markings and Symbols

- ● ● mark: Standard stocked item
- ● mark: To be replaced with the new item featured on the same page
- ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)
- * mark: Semi-standard stock (please confirm stock availability)
- ○ mark: Stock or planned stock (please confirm stock availability)
- Blank: Made-to-order item
- — mark: Not available

Screws

■ Screws

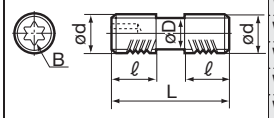
Double Screw



*: Wrench hole on the left-hand thread side only.

	Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
*	WB4-8	●	M4	0.7	7.5	3	3.0	2	—
	WB5-10	●	M5	0.8	10	4	3.8	2.5	—
	WB5-12	●	M5	0.8	12	5	3.8	2.5	—
	WB6-10	●	M6	1.0	10	3.5	4.5	3	—
	WB6-13	●	M6	1.0	13	5	4.5	3	—
	WB6-16	●	M6	1.0	16	6	4.5	3	—
	WB6-20	●	M6	1.0	20	8.5	4.5	3	—
	WB6-30	●	M6	1.0	30	12	4.5	3	—
	WB8-20	●	M8	1.25	20	8.5	6.2	4	—
	WB8-24	●	M8	1.25	24	8.5	6.2	4	—
	WB8-30	●	M8	1.25	30	11.5	6.2	4	—

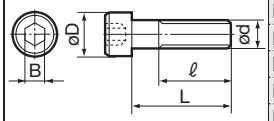
Double Screw (Single Torx)



Torx Hole Position
Part number suffix: T indicates left-hand thread side, TL indicates right-hand thread side

	Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
	WB6-13T	●	M6	1.0	13	5	4.5	T20	—
	WB6-16T	●	M6	1.0	16	6	4.5	T20	—
	WB6-20T	●	M6	1.0	20	8.5	4.5	T20	—
	WB6-20TL	●	M6	1.0	20	8.5	4.5	T20	—
	WB7-15T	●	M7	1.0	15	5.5	5	T25	—
	WB7F-15T	●	M7	0.75	15	5.5	5	T25	—
	WB7F-20TL	●	M7	0.75	20	8.5	5.5	T25	—
	WB8-22T	●	M8	1.25	22	8.5	6.2	T27	—
	WB8-22TL	●	M8	1.25	22	8.5	6.2	T27	—
	WB8-30T	●	M8	1.25	30	11.5	6.2	T27	—
	WB8R-16T	●	M8	1.25	14	5.5	6.2	T27	—
	WB8L-16T	●	M8	1.25	14	5.5	6.2	T27	—

Cap Screw (Bolt with Hexagonal Hole)

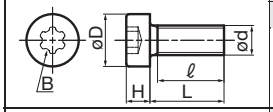


Torx Hole

*With Torx Hole

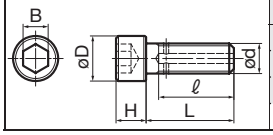
	Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
	BX0304	●	M3	0.5	4	Full thread	5.5	2.5	—
	BX0308	●	M3	0.5	8	Full thread	5.5	2.5	—
	BX0408	●	M4	0.7	8	Full thread	7	3	—
	BX0410	●	M4	0.7	10	Full thread	7	3	—
	BX0414	●	M4	0.7	14	Full thread	7	3	—
	BX0418	●	M4	0.7	18	-	7	3	—
	BX0425	●	M4	0.7	25	20	7	3	—
	BX0508	●	M5	0.8	8	Full thread	8.5	4	—
	BX0510	●	M5	0.8	10	Full thread	8.5	4	—
	BX0512	●	M5	0.8	12	Full thread	8.5	4	—
	BX0515	●	M5	0.8	15	Full thread	8.5	4	—
	BX0520	●	M5	0.8	20	Full thread	8.5	4	5.0
*	BX0520T	●	M5	0.8	20	16	8.5	T20	—
	BX0610	●	M6	1.0	10	Full thread	10	5	—
	BX0615	●	M6	1.0	15	Full thread	10	5	—
	BX0620	●	M6	1.0	20	Full thread	10	5	—
	BX0622	●	M6	1.0	22	18	10	5	—
	BX0625	●	M6	1.0	25	18	10	5	—
	BX0820	●	M8	1.25	20	Full thread	13	6	—
	BX0845	●	M8	1.25	45		13	6	
	BX0850	●	M8	1.25	50		13	6	
	BX1060	●	M10	1.5	60		16	8	
	BX1260	●	M12	1.75	60		18	10	
	BX1265	●	M12	1.75	66		18	10	
	BX1660	●	M16	2.0	60		24	14	
	BX2065	●	M20	2.5	65		30	17	
	EHBX0512	●	M5	0.8	12	10.5	8	4	—
*	FADR	●	M7	1.0	10	7	10.5	T25	—

Cap Screw (Torx Plus)



	Cat. No.	Stock	d	Pitch	L	ℓ	D	H	B	N·m
	BXA0310IP	●	M3	0.5	7.5	Full thread	5.3	2.4	10IP	2.0

Cap Screw with Oil Hole

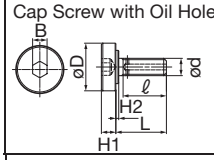


	Cat. No.	Stock	d	Pitch	L	ℓ	D	H	B	N·m
	BXH0825-D13	●	M8	1.25	25	Full thread	13	8	6	—
	BXH1030-D16	●	M10	1.5	30	Full thread	16	10	8	—
	BXH1235-D18	●	M12	1.75	35	Full thread	18	12	10	—

See each product page for the recommended tightening torque (N·m) in use.

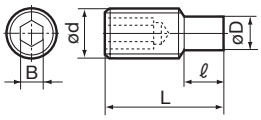
■ Screws

Cap Screw with Oil Hole



	Cat. No.	Stock	d	Pitch	L	ℓ	D	H1	H2	B	N·m
	BXH1235-D33	●	M12	1.75	35	Full thread	33	10	2	10	—
	BXH1635-D40	●	M16	2.0	35	30	40	10	—	14	—
	BXH2036-D50	●	M20	2.5	36	29	50	14	4	17	—

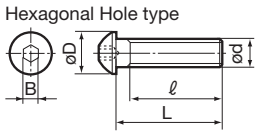
Set Screw (Hexagonal Hole)



	Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
	BTD0408	●	M4	0.7	8	2	2.8	2	—
	BTD0508	●	M5	0.8	8	2	3.5	2.5	—
	BTD05F09	●	M5	0.5	9	2	4	T15	—
	BTD0510	●	M5	0.8	10	3	3.5	2.5	—
	BTD0609	●	M6	1.0	9	2	4	3	—
	BTD0812	●	M8	1.25	12	2	5	4	—
	BTD0818	●	M8	1.25	18	6	5	4	—

Button Head Screw

Hexagonal Hole type



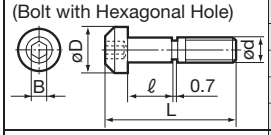
Torx Hole

"T" after the part number indicates "Torx hole"

★: Same wrench hole (B) on the screw end
*: Left-hand threads

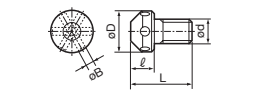
		Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
	★	BH0304	●	M3	0.5	4	Full thread	5.5	2	—
		BH0306	●	M3	0.5	6	Full thread	5.5	2	—
		FBUP3-A0-9 (equiv. BH0308)	●	M3	0.5	8	Full thread	5.5	2	1.0
	★	BH0310	●	M3	0.5	10	Full thread	5.5	2	—
		BH03504	●	M3.5	0.6	4	Full thread	7	2	—
	★	BH0408	●	M4	0.7	8	Full thread	6	2.5	—
		BH0410T	●	M4	0.7	10	8	7.5	T15	—
	★	BH0516	●	M5	0.8	16	14.4	9.5	3	—
		BH0615	●	M6	1.0	15	Full thread	10.5	4	—
	★	BH0616	●	M6	1.0	16	14	10.5	4	—
		BH0620	●	M6	1.0	20	Full thread	10.5	4	—
	★	BH0824R	●	M8	1.25	24	20	12	4	—
*	★	BH0824L	●	M8	1.25	24	20	12	4	—
	★	BH0825	●	M8	1.25	25	22.5	14	5	—
	★	BH0830R	●	M8	1.25	30	26	12	4	—
*	★	BH0830L	●	M8	1.25	30	26	12	4	—
	★	BH1030R	●	M10	1.5	30	26	14	5	—
*	★	BH1030L	●	M10	1.5	30	26	14	5	—
	★	BH1036R	●	M10	1.5	36	32	14	5	—
*	★	BH1036L	●	M10	1.5	36	32	14	5	—

Special Cap Screw (Bolt with Hexagonal Hole)



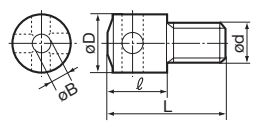
	Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
	BHA0525	●	M5	0.8	25.5	9	8.5	3	—
	BHA0625	●	M6	1.0	30	11	10.5	4	—
	BHE0407	●	M4	0.7	9.5	2	5.7	2.5	1.8
	BHE0510	●	M5	0.8	13	3	7.7	3	2.7

Axial Adjustment Bolt



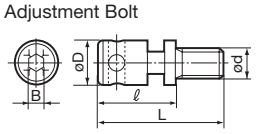
	Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
	AJM4F	●	M4	0.5	12	5	8	2	—

Axial Adjustment Bolt



	Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
	RFJ	●	M4	0.7	12	6	6	2	—

Adjustment Bolt

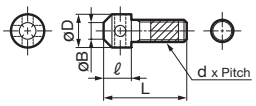


	Cat. No.	Stock	d	Pitch	L	ℓ	D	B	N·m
	SRFJ	●	M4	0.7	17	10.5	6	2	—

Screws

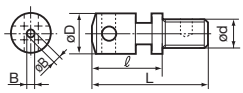
■ Screws

Axial Adjustment Bolt



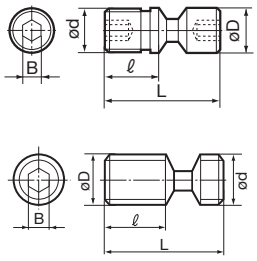
Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D	B	N·m
FMJ	●	M4	0.7	15	5	6	3	—

Adjustment Bolt



Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D	B	N·m
FMUJ	●	M4	0.7	17	10.5	6	1	—

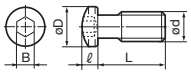
Lever Lock Bolt



LCS33NT Shape

Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D	B	N·m
LCS3	●	M6	1.0	17	10	6	2.5	—
LCS4	●	M8	1.0	21	10	8	3	—
LCS5	●	M8	1.0	25	12	8	3	—
LCS6	●	M10	1.0	27.2	14.4	9.8	4	—
LCS4CA	●	M8	1.0	17.5	10	8	3	—
LCS8	●	M12	1.0	36	18.3	11.8	5	—
LCS10	●	M5	0.8	14.5	8.5	5	2	—
LCS12	●	M6	1.0	17	9.6	6	2.5	—
LCS16	●	M6	1.0	21	13.6	6	2.5	—
LCS20	●	M8	1.0	23.5	13.2	8	3.0	—
LCS25	●	M10	1.0	30	17.4	10	4.0	—
LCS32	●	M12	1.0	36	19.3	12	5.0	—
LCS3TE	●	M6	1.0	15.5	8.5	6	2.5	—
LCS33NT	●	M5	0.8	12	6.2	—	2	—

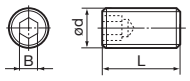
Fastener Bolt



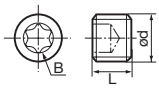
Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D	B	N·m
FBH0512	●	M5	0.8	12	3.1	7.3	3	—
FBX0811	●	M8	1.25	11.1	4.9	8.5	4	—
FBX0817	●	M8	1.25	17.1	4.9	8.5	4	—

Set Screw

Hexagonal Hole type



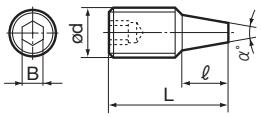
Torx Hole



Indicates BT06035T shape

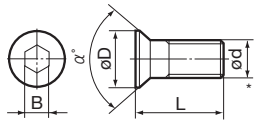
Cat. No.	Stock	Dimensions (mm) d	Pitch	L	—	B	—	N·m
BT0306	●	M3	0.5	6	—	1.5	—	—
BT0404	●	M4	0.7	4	—	2	—	—
BT0406	●	M4	0.7	6	—	2	—	—
BT0408	●	M4	0.7	8	—	2	—	—
BT0506	●	M5	0.8	6	—	2.5	—	—
BT06035T	●	M6	1.0	3.5	—	T15	—	—

Set Screw (Hexagonal Hole)



Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	—	B	α°	N·m
BTT0407	●	M4	0.5	7	2.6	—	2	60	—
BTT0411	●	M4	0.5	11	2.6	—	2	60	—

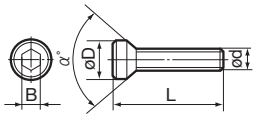
Flat Head Screw



*: Left-hand threads *

Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	B	α°	N·m
FBUP2-A0-8	●	M3	0.5	10	5.5	2	82	1.0
BFX0410R	●	M4	0.7	9.5	5.8	2.5	90	1.8
BFX0410L	●	M4	0.7	9.5	5.8	2.5	90	1.8
BFX0511R	●	M5	0.8	10.5	7.5	3	90	2.7
BFX0511L	●	M5	0.8	10.5	7.5	3	90	2.7

Special Cap Screw (Hexagonal Hole)

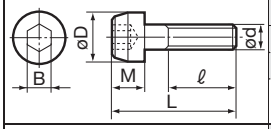


Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	B	α°	N·m
BXF0520R	●	M5	0.8	25	8.5	4	90	7.0
BXF0616	●	M6	1.0	16	9	4	90	—

See each product page for the recommended tightening torque (N·m) in use.

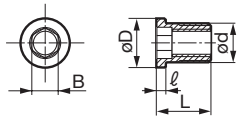
■ Screws

Cap Screw



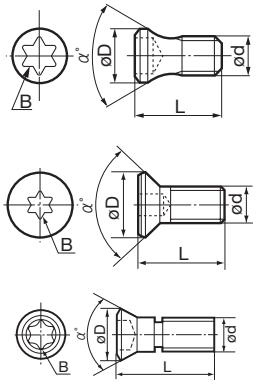
Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D	B	M	N·m
QBX120	●	M12	1.75	54	30	22	10	14	—
QBX160	●	M16	2.0	56	30	28	14	16	—

Special Hollow Screw



Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D	B	N·m
BW0507F	●	M5	0.5	7	1.2	6.3	3.5	—
BW0609F	●	M6	0.75	9	1.5	7.7	4	—

Torx Flat Head Screw



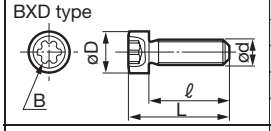
*BFTX02508NV only

Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	B	α°	N·m
BFT2045T06	●	M2	0.4	4.5	2.7	T6	60	—
BFT2506T08	●	M2.5	0.45	6	3.45	T8	60	—
BFTY02205	●	M2.2	0.45	5	3.05	T7	60	—
BFTY02206	●	M2.2	0.45	5.6	3.05	T7	60	1.0
BFN0511T	●	M5	0.8	10.5	7.3	T20	90	—
BFTX016033	●	M1.6	0.35	3.3	2.6	T6	60	0.2
BFTX02507	●	M2.5	0.45	6.5	3.45	T8	60	—
BFTX03508	●	M3.5	0.6	8	5.1	T10	52	2.0
BFTX03584	●	M3.5	0.6	7.4	5.2	T15	60	3.0
BFTX03588	●	M3.5	0.6	8.8	5.2	T15	60	3.4
BFTX0408	●	M4	0.7	8	5.5	T15	60	—
BFTX0414	●	M4	0.7	14.5	5.5	T15	60	3.0
BFTX01604N	●	M1.6	0.35	4.2	2.4	T6	60	0.2
BFTX0203N	●	M2	0.4	3	2.7	T6	60	0.5
BFTX0204N	●	M2	0.4	4.3	2.7	T6	60	0.5
BFTX02205N	●	M2.2	0.45	4.5	3	T6	60	0.5
BFTX02505N	●	M2.5	0.45	4.5	3.45	T8	60	1.1
BFTX02506N	●	M2.5	0.45	5.5	3.45	T8	60	1.5
BFTX0305N	●	M3	0.5	5.3	4.2	T10	60	2.0
BFTX0306N	●	M3	0.5	5.8	4.2	T10	60	2.0
BFTX0307N	●	M3	0.5	6.5	4.2	T10	60	2.0
BFTX03085N	●	M3	0.5	8.5	5.4	T10	60	—
BFTX0312N	●	M3	0.5	12	5.4	T10	60	—
BFTX0407N	●	M4	0.7	7	5.6	T15	60	3.0
BFTX0409N	●	M4	0.7	9	5.6	T15	60	3.4
BFTX0412N	●	M4	0.7	12	5.5	T15	60	3.0
BFTX0509N	●	M5	0.8	9	7	T20	60	5.0
BFTX0511N	●	M5	0.8	11.5	7	T20	60	5.0
BFTX0513N	●	M5	0.8	13	7	T20	60	5.0
BFTX0515N	●	M5	0.8	15	7	T20	60	—
BFTX0615N	●	M6	1.0	15	9	T25	60	5.0
BFTX0619N	●	M6	1.0	19	9.3	T25	60	5.0
BFTX0203A	●	M2	0.4	3	2.7	T6	90	0.5
BFTX0204A	●	M2	0.4	4.3	2.7	T6	90	0.5
BFTX0305A	●	M3	0.5	5.3	4.3	T10	90	—
BFTX0306A	●	M3	0.5	5.8	4.3	T10	90	2.0
BFTX0307A	●	M3	0.5	6.8	4.3	T10	90	2.0
BFTX0407A	●	M4	0.7	7.3	5.6	T15	90	3.4
BFTX0410A	●	M4	0.7	10.3	5.6	T15	90	3.4
BFTX0509A	●	M5	0.8	9.3	6.9	T20	90	5.0
BFTX0204NS	●	M2	0.4	4.4	3.2	T1.8	82	0.7
BFTX0205NS	●	M2	0.4	5.5	3.2	T1.8	90	0.7
BFTX02506NS	●	M2.5	0.45	6.8	3.6	T2.2	90	1.4
BFTX0307NS	●	M3	0.5	7.8	4.2	T2.9	90	3
BFTX02206NT	●	M2.2	0.45	6	3.2	T1.8	60	0.7
BFTX02507NT	●	M2.5	0.45	7	3.6	T2.2	60	1.4
BFTX0408NT	●	M4	0.7	8	5.8	T3.6	60	5
BFTX0410NT	●	M4	0.7	10	5.8	T3.6	60	5
BFTX02508NV	●	M2.5	0.45	7.5	3.45	T8	60	1.5

Screws / Eccentric Pins / Lever Pins / Shims

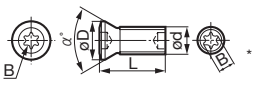
■ Screws

Special Cap Screw BXD type



Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D	B	N·m
BFF2506T08	●	M2.5	0.8	7.5	6	3.45	T8	—
BFF3505T10	●	M3.5	0.6	6.6	5	5	T10	—
BFF4510T15	●	M4.5	0.75	12.1	10.5	5.9	T15	—

Torx Screw (Torx Double Ended)

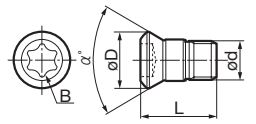


*: Left-hand threads

Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	B	α°	N·m
BFTX0410T8R	●	M4	0.7	9.6	5.6	T8	60	1.1
BFTX0410T8L	●							1.1

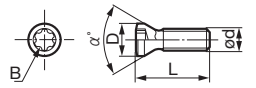
R: right-hand thread, L: left-hand thread

Precision Screw (With Torx Hole) <For SEC Ballnose Endmills>



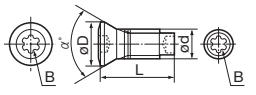
Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	B	α°	N·m
BFTG0408F	●	M4	0.5	7.5	5.7	T15	61	3.4
BFTG0409F	●	M4	0.5	8.4	6.15	T15	61	3.4
BFTG0513F	●	M5	0.5	13	6.8	T20	61	5.0
BFTG0617F	●	M6	0.75	16.5	8	T25	61	7.5
BFTG0621F	●	M6	0.75	21	9.5	T25	61	7.5
BFTG0825F	●	M8	0.75	24.5	12	T25	61	7.5

Torx Screw



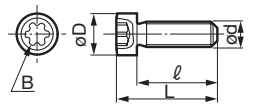
Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	B	α°	N·m
BFTX01804IP	●	M1.8	0.35	3.7	2.45	6IP	60	—
BFTX02505IP	●	M2.5	0.45	4.5	3.45	8IP	60	—
BFTX02506IP	●	M2.5	0.45	5.5	3.45	8IP	60	—
BFTX0305IP	●	M3	0.5	5.3	3.8	8IP	60	2.0
BFTX0306IP	●	M3	0.5	6	3.8	8IP	60	2.0
BFTX0307IP	●	M3	0.5	7	4.3	10IP	55	2.0
BFTX0308IP	●	M3	0.5	8	3.8	8IP	60	—
BFTX03510IP	●	M3.5	—	9.65	5.3	—	60	—
BFTX03510IP08	●	M3.5	0.6	10	5.3	8IP	60	—
BFTX03510IP15	●	M3.5	0.6	10	5.3	15IP	60	—
BFTX03512IP	●	M3.5	0.6	11.5	5.3	15IP	60	3.0
BFTX03584IP	●	M3.5	0.6	7.4	5.2	15IP	60	—
BFTX0407IP	●	M4	0.7	8	5.6	15IP	60	3.0
BFTX0409IP	●	M4	0.7	9	5.6	15IP	60	3.0
BFTX0412IP	●	M4	0.7	12	5.5	15IP	60	3.0
BFTX0418IP	●	M4	0.7	18	5.5	15IP	60	—
BFTX04513IP20	●	M4.5	0.75	13.1	6.8	20IP	60	—
BFTX0511IP	●	M5	0.8	11.5	7	20IP	60	—
BFTX0513IP	●	M5	0.8	13	7	20IP	60	—
BFTX0615IP	●	M6	1.0	15	9	25IP	60	—

Flat Screw (Torx Plus Double Ended)



Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	B	α°	N·m
BFTX0410NSW	●	M4	0.7	10	5.8	2.2	90	1.4
BFTX0410NTW	●	M4	0.7	10	5.85	2.2	60	1.4
BFTX0412NTW	●	M4	0.7	12	5.85	2.2	60	1.4

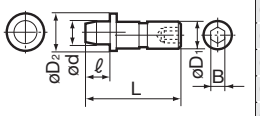
Cap Screw (Torx Plus)



Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D	B	N·m
BXD02208IP	●	M2.2	0.45	7.5	5.7	3.5	8IP	—
BXD02509IP	●	M2.5	0.45	9	7	4.1	10IP	—
BXD03011IP	●	M3	0.5	10.5	8	4.9	15IP	—
BXD03512IP	●	M3.5	0.6	11.5	8.8	5.5	15IP	—
BXD04014IP	●	M4	0.7	12.5	9.5	6	20IP	—
BXD04515IP	●	M4.5	0.75	14.3	10.8	6.8	25IP	—

■ Eccentric Pins

For SEC-Boring Bar

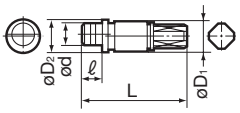


Cat. No.	Stock	Dimensions (mm) d	D_1	D_2	L	ℓ	B	N·m
CPB43	●	4.5	5.5	7	19	5	3	—
CPB44T	●	4.5	5.5	7	22	5	3	—
CPB43S	●	4.5	5.5	7	16	5	3	—
CPB32C	●	3.3	4.1	5.5	14	3.4	2.5	—
CPB32	●	3.4	4.1	5.5	14	3.4	2.5	—
CPB34	●	3.4	4.1	5.5	14	5	2.5	—
CPB35	●	3.4	4.1	5.5	17	5	2.5	—
CPB42	●	4.5	5.5	7	14	5	3	—
CPB64	●	6.8	8.2	10.5	24	6.6	4	—

See each product page for the recommended tightening torque (N·m) in use.

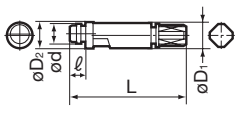
■ Eccentric Pins

For SEC-30 type Holders



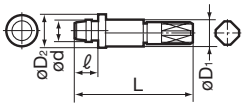
Cat. No.	Stock	Dimensions (mm) d	D_1	D_2	L	ℓ	—	N·m
P432U	●	5.025	7	7.5	21	4.9	—	—
P433U	●	5.025	7	7.5	24	4.9	—	—
P434U	●	5.025	7	7.5	30	4.9	—	—
P221US	●	2.11	3.5	4	18	3.3	—	—
P321US	●	3.635	5	5.5	18	3.3	—	—
P322US	●	3.635	5	5.5	21	3.3	—	—
P323US	●	3.635	5	5.5	24	3.3	—	—
P332US	●	3.635	5	5.5	21	4.9	—	—
P333US	●	3.635	5	5.5	24	4.9	—	—
P334US	●	3.635	5	5.5	30	4.9	—	—

For SEC-30 type Holders



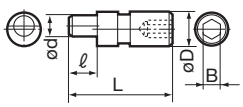
Cat. No.	Stock	Dimensions (mm) d	D_1	D_2	L	ℓ	—	N·m
P433W	●	5.025	7	7.8	24	4.9	—	—
P434W	●	5.025	7	7.8	30	4.9	—	—
P323WS	●	3.635	5	5.8	24	3.3	—	—
P333WS	●	3.635	5	5.8	24	4.9	—	—
P334WS	●	3.635	5	5.8	30	4.9	—	—

For SEC-60 type Holders



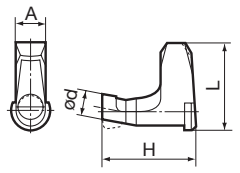
Cat. No.	Stock	Dimensions (mm) d	D_1	D_2	L	ℓ	—	N·m
CPZ333	▲	3.4	4.1	5.5	25	5	—	—
CPZ333V	●	3.4	4.1	5.5	29	5	—	—
CPZ334	●	3.4	4.1	5.5	32	5.5	—	—
CPZ334V	●	3.4	4.1	5.5	35	5	—	—

For SEC-Cartridge BU

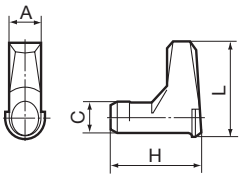


Cat. No.	Stock	Dimensions (mm) d	D	D_2	L	ℓ	B	N·m
CPU304C	●	3.3	5.5	—	10	3.5	3	—

■ Lever Pins



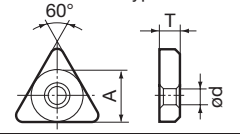
Cat. No.	Stock	Dimensions (mm) A	H	L	d	—	—	N·m
LCL06	●	2.5	6.28	7	2	—	—	—
LCL09	●	3.4	9.3	10.75	3	—	—	—
LCL10	●	3.4	11.8	10.8	3	—	—	—
LCL12	●	3.7	13.4	12.9	3.5	—	—	—
LCL16	●	4.6	17.6	18.4	4.4	—	—	—
LCL20	●	6	18.9	20.4	5.6	—	—	—



Cat. No.	Stock	Dimensions (mm) A	H	L	C	—	—	N·m
LCL3S	●	3.7	10.6	10	3.6	—	—	—
LCL4S	●	4.7	14	14.55	4.4	—	—	—
LCL3	●	3.7	12	10	3.6	—	—	—
LCL4	●	4.7	14	14.55	4.7	—	—	—
LCL5	●	6	17	17.1	6	—	—	—
LCL6	●	7.5	21	20.5	7.5	—	—	—
LCL8	●	8.6	25.4	25.4	8.6	—	—	—
LCL33NT	●	3.2	9.4	10	3.2	—	—	—

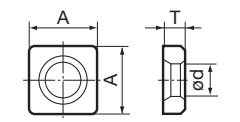
■ Shims

For Lever Lock type Holders



Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
LST317	●	9.5	2.7	5.2	—	—	—	—
LST42	●	12.65	3.18	6.9	—	—	—	—

For Lever Lock type Holders



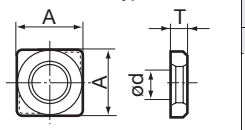
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
LSS32	●	9.48	3.18	5	—	—	—	—
LSS42	●	12.65	3.18	6.9	—	—	—	—
LSS53	●	15.85	4.76	7.9	—	—	—	—
LSS63	●	19	4.76	10	—	—	—	—
LSS84	●	25.35	6.35	13.2	—	—	—	—

N·m Recommended tightening torque (N·m) ▲ mark: To be replaced by a new product, made to order, or discontinued (please confirm stock availability)

Shims

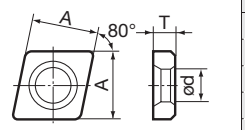
■ Shims

For Lever Lock type Holders



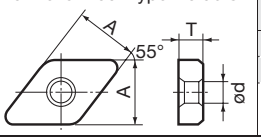
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
LSS42B	●	12.65	3.18	6.9	—	—	—	—

For Lever Lock type Holders



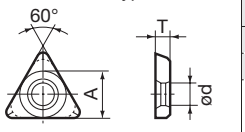
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
LSC317	●	9.5	2.7	5.2	—	—	—	—
LSC32	●	9.48	3.18	5	—	—	—	—
LSC42	●	12.65	3.18	6.9	—	—	—	—
LSC53	●	15.85	4.76	7.9	—	—	—	—
LSC63	●	19	4.76	10	—	—	—	—

For Lever Lock type Holders



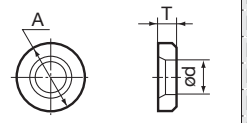
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
LSD317	●	9.5	2.7	5.2	—	—	—	—
LSD42	●	12.65	3.18	6.9	—	—	—	—

For Lever Lock type Holders



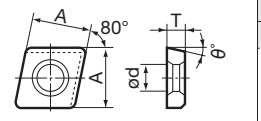
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
LST317CA	●	9.33	2.7	5	—	—	—	—
LST53	●	15.85	4.76	7.9	—	—	—	—

For Lever Lock type Holders



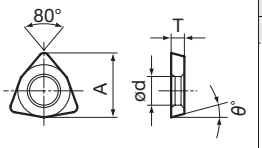
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
LSR817	●	8.4	2.7	5.2	—	—	—	—
LSR10	●	8.4	3.18	4.7	—	—	—	—
LSR12	●	10	3.18	4.7	—	—	—	—
LSR16	●	13.5	4.76	6.3	—	—	—	—
LSR20	●	17.2	4.76	7.9	—	—	—	—
LSR25	●	22	6.35	9.5	—	—	—	—
LSR32	●	28	6.35	12.7	—	—	—	—

For Lever Lock type Holders



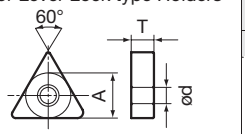
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	θ°	N·m
LSC42B	●	12.65	3.18	6.9	—	—	8	—

For Lever Lock type Holders



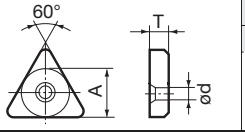
Cat. No.	Stock	Dimensions (mm) A	T	d	D	—	θ°	N·m
LSW42B	●	12.7	3.18	6.9	15	—	—	—

For Lever Lock type Holders



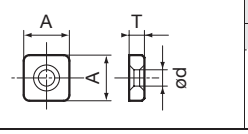
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	θ°	N·m
STN1103		6.3	3.18	3.4	—	—	—	—

For SEC-20 & 40 type Holders



Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
STND323	●	9.3	3.18	3.4	—	—	—	—

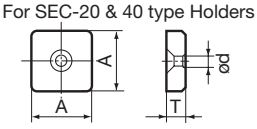
For Lever Lock type Holders



Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	θ°	N·m
SSN0903	●	9.5	3.18	3.4	—	—	—	—

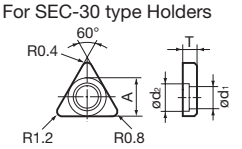
■ Shims

For SEC-20 & 40 type Holders



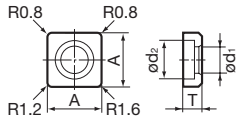
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
SSND423	●	12.5	3.18	3.4	—	—	—	—
SSND433	●	12.5	4.76	3.4	—	—	—	—

For SEC-30 type Holders



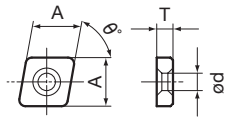
Cat. No.	Stock	Dimensions (mm) A	T	d1	d2	—	—	N·m
EST32	●	9.53	3.18	5.5	5.9	—	—	—
EST43	●	12.7	4.76	7.5	7.9	—	—	—

For SEC-30 type Holders



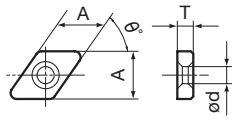
Cat. No.	Stock	Dimensions (mm) A	T	d1	d2	—	—	N·m
ESS42	●	12.7	3.18	7.5	7.9	—	—	—

For SEC-30 type Holders



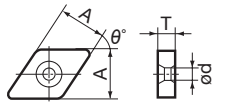
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	θ°	N·m
SCN0903	●	9.5	3.18	3.4	—	—	80	—

For SEC-30 type Holders



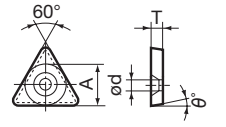
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	θ°	N·m
SDN1103	●	9.5	3.18	3.4	—	—	55	—

For SEC-40 type Holders



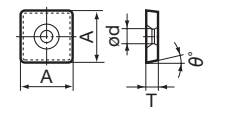
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	θ°	N·m
SCND433	●	12.65	4.76	3.4	—	—	80	—

For SEC-40 type Holders



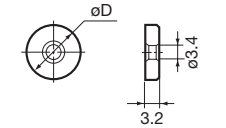
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	θ°	N·m
STPD322	●	8.4	3.18	3.4	—	—	6	—
STPD422	●	11	3.18	3.4	—	—	6	—
STPL42	●	11	3.18	3.4	—	—	6	—

For SEC-40 type Holders



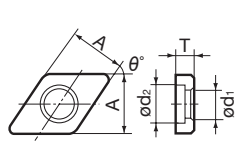
Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	θ°	N·m
SSPD422	●	11.6	3.18	3.4	—	—	6	—
SSPD522	●	14.1	3.18	3.4	—	—	6	—

For SEC-40 type Holders



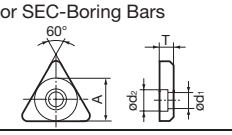
Cat. No.	Stock	Dimensions (mm) T	d	D	—	—	—	N·m
SRND32	●	3.2	3.4	9.53	—	—	—	—
SRND42	●	—	—	12.7	—	—	—	—

For SEC-60 type Holders



Cat. No.	Stock	Dimensions (mm) A	T	d1	d2	—	θ°	N·m
SVW322	●	9.5	3.18	4.7	6.5	—	35	—
SDW323	●	9.5	3.18	4.7	6.5	—	55	—
SDW423	●	12.65	3.18	6.2	8	—	55	—
SCW323	●	9.5	3.18	4.8	6.5	—	80	—
SCW423	●	12.65	3.18	6.2	8	—	80	—
SCW635	●	19	4.76	9	11.5	—	80	—

For SEC-M type Holders
For SEC-Boring Bars

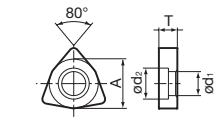


Cat. No.	Stock	Dimensions (mm) A	T	d1	d2	—	—	N·m
STW323	●	9.5	3.18	4.7	6.5	—	—	—
STW434	●	12.65	4.76	6.2	8	—	—	—

Shims / Seats

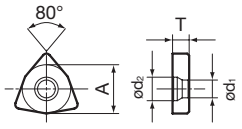
■ Shims

For SEC-M type Holders



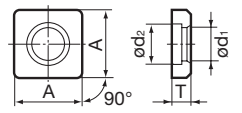
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	—	—	N·m
SWW433	●	12.65	4.76	6.2	8	—	—	—

For SEC-M type Holders



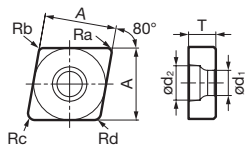
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	—	θ°	N·m
WNS0603B	●	9.525	3.18	3.4	4.5	—	—	—
WNS0803B	●	12.7	3.18	3.4	4.5	—	—	—
WNS0804	●	12.57	4.76	4.4	6	—	—	—
WNS0804B	●	12.7	4.76	4.4	6	—	—	—

For SEC-Boring Bar



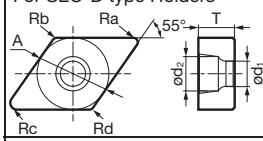
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	—	—	N·m
SSW423	●	12.65	3.18	6.2	8	—	—	—
SSW635	●	19	4.76	9	11.5	—	—	—

For SEC-D type Holders



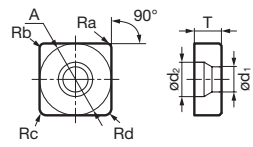
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	Ra	Rb	Rc	Rd	N·m
CNS1204	●	12.57	4.76	4.4	6	0.8	0.8	1.2	1.2	—
CNS1606	●	15.75	4.76	5.5	7.5	1.2	1.2	1.2	1.2	—
CNS1906	●	18.70	6.35	5.5	7.5	1.6	1.6	1.2	1.2	—
CNS2509	●	25.27	6.35	6.6	9.5	2.4	2.4	2.4	2.4	—
CNS1204-R24	●	12.57	4.76	4.4	6	2	0.8	2.4	1.2	—

For SEC-D type Holders



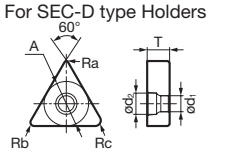
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	Ra	Rb	Rc	Rd	N·m
DNS1504	●	12.57	6.35	4.4	6	0.8	0.8	1.2	0.8	—
DNS1506	●	12.57	4.76	4.4	6	0.8	0.8	1.2	0.8	—
DNS1504-R24	●	12.57	6.35	4.4	6	2	0.8	2.4	0.8	—

For SEC-D type Holders



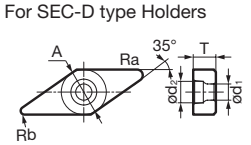
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	Ra	Rb	Rc	Rd	N·m
SNS1203B	●	12.57	3.18	3.4	4.5	—	—	—	—	—
SNS1204	●	12.57	4.76	4.4	6	0.8	0.8	1.2	1.2	—
SNS1506	●	15.75	4.76	5.5	7.5	1.2	1.2	1.2	1.2	—
SNS1906	●	18.92	6.35	5.5	7.5	1.2	1.2	1.2	1.2	—
SNS2507	●	25.27	7.93	6.6	9.5	2.4	2.4	2.4	2.4	—
SNS2509	●	25.27	6.35	6.6	9.5	2.4	2.4	2.4	2.4	—

For SEC-D type Holders



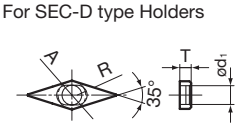
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	Ra	Rb	Rc	N·m
TNS1603B	●	9.525	3.18	3.4	4.5	—	—	—	—
TNS1604	●	9.45	4.76	3.4	4.5	0.4	0.8	1.2	—
TNS1604B	●	9.525	4.76	3.4	4.5	—	—	—	—
TNS1604-R24	●	9.45	4.76	3.4	4.5	1.6	2	2.4	—

For SEC-D type Holders



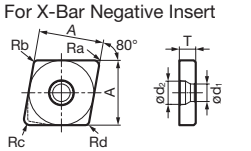
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	Ra	Rb	N·m
VNS1604	●	9.45	4.76	3.4	4.5	1.2	0.8	—

For SEC-D type Holders



Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	Ra	Rb	N·m
SVP32	●	7.73	3.55	5.5	—	—	—	—

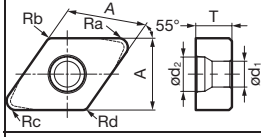
For X-Bar Negative Insert



Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	Ra	Rb	Rc	Rd	N·m
CNS1203B	●	12.57	3.18	3.4	4.5	1.2	0.8	1.2	0.8	—
CNS1204B	●	12.57	4.76	4.4	6	1.2	0.8	1.2	0.8	—

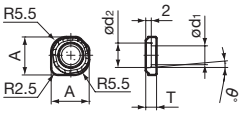
■ Shims

For X-Bar Negative Insert



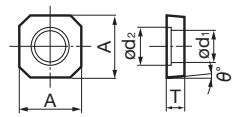
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	Ra	Rb	Rc	Rd	N·m
DNS1104B	●	9.45	4.76	3.4	4.5	1.2	0.8	1.2	0.8	—
DNS1506B	●	12.57	4.76	4.4	6	1.2	0.8	1.2	0.8	—
DNS1504B	●	12.57	6.35	4.4	6	1.2	0.8	1.2	0.8	—

For SEC-Sumi Dual Mill DGC series



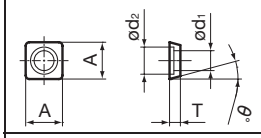
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	—	θ°	N·m
DGCS13R	●	13.7	3.9	6.8	8.8	—	5	—

For SEC-WaveMill WGC/WGX series



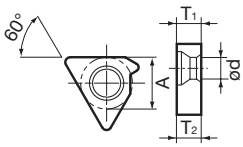
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	—	θ°	N·m
WGCS13R	●	10.7	3	5.5	7.5	—	5	—

For SEC-WaveMill WFX series



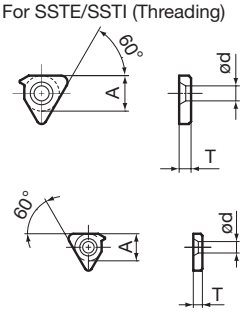
Cat. No.	Stock	Dimensions (mm) A	T	d_1	d_2	—	θ°	N·m
WFXS4R	●	10.2	3	5.5	7.5	—	15	—

For LTER (Threading)



Cat. No.	Stock	Dimensions (mm) A	T_1	T_2	d	—	—	N·m
LSTE31-0	●	9.5	2.7	2.7	5.2	—	—	—
LSTE42-0	●	12.65	3.18	3.18	7	—	—	—

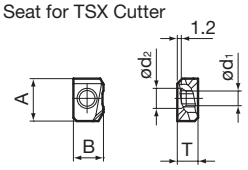
For SSTE/SSTI (Threading)



Cat. No.	Stock	Dimensions (mm) A	T	d	—	—	—	N·m
YE3	●	9.5	3.2	4	—	—	—	—
YI3	●	9.5	3.2	4	—	—	—	—

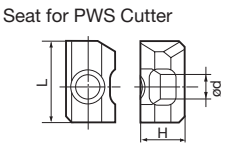
■ Seats

Seat for TSX Cutter



Cat. No.	Stock	Dimensions (mm) A	B	T	d_1	d_2	—	N·m
TSXS13R	●	12.7	9	6.2	4.4	6	—	—

Seat for PWS Cutter

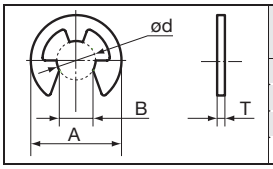


Cat. No.	Stock	Dimensions (mm) d	L	H	—	—	—	N·m
PWSS4R	●	4.6	15	8	—	—	—	—

N·m Recommended Tightening Torque (N·m)

Retaining Rings / Pins / Nuts / Drawing Pins / Wrenches

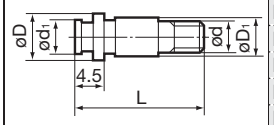
■ Retaining Rings



Cat. No.	Stock	Dimensions (mm) A	B	T	d	—	—	N·m
ER03	●	7	2.6	0.6	3	—	—	—
ER04	●	9	3.5	0.6	4	—	—	—
ER05	●	11	4.3	0.6	5	—	—	—

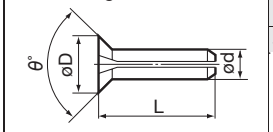
■ Pins

For SEC-M type Holders



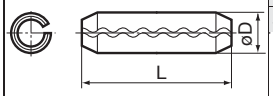
Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	D_1	d_1	N·m
MP317	●	M4	0.7	15.5	6	4	3.7	—
MP317S	●	M4	0.7	15.5	6	4	3.56	—
MP320	●	M4	0.7	19.5	6	4	3.7	—
MP320S	●	M4	0.7	19.5	6	4	3.56	—
MP416	●	M5	0.8	14	7.5	6	5	—
MP420	●	M5	0.8	20	7.5	6	5	—

For SEC-Light Endmill



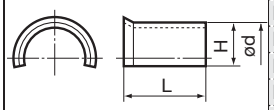
Cat. No.	Stock	Dimensions (mm) d	—	L	D	θ°	—	N·m
SPP308	●	3.2	—	8	4.8	60°	—	—

For SEC-20 & 40 type Holders



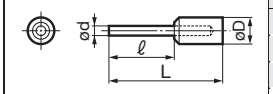
Cat. No.	Stock	Dimensions (mm) —	—	L	D	—	—	N·m
SPP3	●	—	—	14	3.2	—	—	—

For SEC-70 type Holders



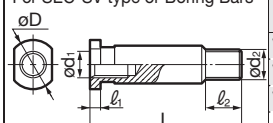
Cat. No.	Stock	Dimensions (mm) d	H	L	—	—	—	N·m
LSP3	●	5	3.3	5.5	—	—	—	—
LSP4	●	6.7	4	7	—	—	—	—
LSP5	●	7.7	4.5	8.5	—	—	—	—
LSP6	●	9.85	6	11.1	—	—	—	—
LSP8	●	13.05	10	12	—	—	—	—
LSP10	●	5	3.3	6.5	—	—	—	—
LSP16	●	6.6	4.5	9	—	—	—	—
LSP20	●	8.2	5.5	9	—	—	—	—
LSP25	●	9.8	6.5	11	—	—	—	—
LSP32	●	13	10	12	—	—	—	—

Pin for SEC-Mini Tool Holder



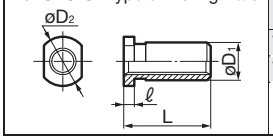
Cat. No.	Stock	Dimensions (mm) d	D	L	ℓ	—	—	N·m
LP04	●	0.4	1.1	4.7	3	—	—	—
LP06	●	0.4	1.1	6	5	—	—	—
LP07	●	0.4	1.1	7.7	3.5	—	—	—

For SEC-SV type or Boring Bars



Cat. No.	Stock	Dimensions (mm) d_1	d_2	L	D	ℓ_1	ℓ_2	N·m
VP20	●	M3.5	M4	12	6.5	≥ 4.5	≥ 4.5	—
VP25	●	M3.5	M4	17	6.5	≥ 4.5	≥ 4.5	—
VP32	●	M3.5	M4	24	6.5	≥ 4.5	≥ 4.5	—

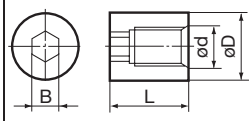
For SEC-SV type or Boring Bars



Cat. No.	Stock	Dimensions (mm) d	Pitch	L	ℓ	D_1	D_2	N·m
VP32B	●	M3.5	0.6	8	1.4	5	6.5	—
VP40B	●	M3.5	0.6	11.5	1.4	5	6.5	—

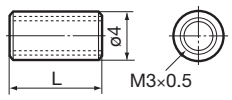
■ Nuts

For SEC-M type Holders



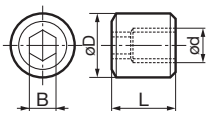
Cat. No.	Stock	Dimensions (mm) d	L	D	B	—	—	N·m
CPM32N	●	M4	7.5	7	3	—	—	—
CPM43N	●	M5	8.5	7	3	—	—	—
CPM43S	●	M5	6	7	3	—	—	—

For BNB Holder



Cat. No.	Stock	Dimensions (mm) L	—	—	—	—	—	N·m
BNBW-4	●	4	—	—	—	—	—	—
BNBW-7	●	7	—	—	—	—	—	—

For BNB Holder



Cat. No.	Stock	Dimensions (mm) d	Pitch	L	D	B	—	N·m
CPV33N	●	M4	0.5	6	6	2.5	—	—

■ Drawing Pins

Fig1

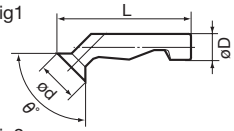
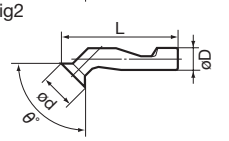


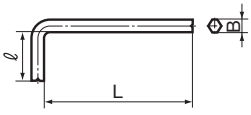
Fig2



Cat. No.	Stock	Dimensions (mm) d	D	L	θ°	—	Fig	N·m
SR083	●	5	2.9	20	60	—	1	—
SR124	●	6	3.9	24	60	—		
SR134B	●	6	3.9	22.5	60	—	2	—

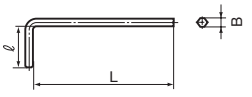
■ Wrenches

L-Shaped Wrench (Hex)



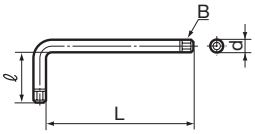
Cat. No.	Stock	Dimensions (mm) B	L	ℓ	—	—	—	N·m
LH015	●	1.5	45	14	—	—	—	—
LH020	●	2	50	16	—	—	—	—
LH025	●	2.5	56	18	—	—	—	—
LH030	●	3	63	20	—	—	—	—
LH035	●	3.5	22	68	—	—	—	—
LH040	●	4	70	25	—	—	—	—
LH050	●	5	80	28	—	—	—	—
LH060	●	6	90	32	—	—	—	—
LH080	●	8	100	36	—	—	—	—

L-Shaped Wrench (Hex)



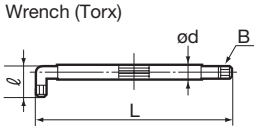
Cat. No.	Stock	Dimensions (mm) B	L	ℓ	—	—	—	N·m
LH020NT	●	2	50	16	—	—	—	—
LH025NT	●	2.5	56	6	—	—	—	—

L-Shaped Wrench (Torx)



Cat. No.	Stock	Dimensions (mm) B	d	L	ℓ	—	—	N·m
LT08-06	●	T8	2.3	42.5	6	—	—	—
LT15-10	●	T15	2.8	62	10	—	—	—
LT15	●	T15	3.26	54	17.9	—	—	—
LT20	●	T20	3.9	57.2	19.1	—	—	—
LT25	●	T25	4.4	60.3	20.2	—	—	—
LT27	●	T27	4.96	63.5	21.5	—	—	—

Wrench (Torx)

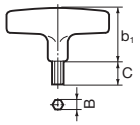


Cat. No.	Stock	Dimensions (mm) B	d	L	ℓ	—	—	N·m
LT25NT	●	3.6	4	65	10	—	—	—

Wrenches

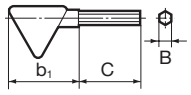
■ Wrenches

Wrench (Hex)



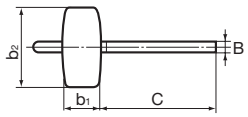
Cat. No.	Stock	Dimensions (mm) B	b1	C	—	—	—	N·m
TH030	●	3	48	28	—	—	—	—
TH040	●	4	48	37	—	—	—	—
TH050	●	5	48	45	—	—	—	—

T-Shaped Wrench (Hex)



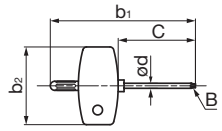
Cat. No.	Stock	Dimensions (mm) B	b1	C	—	—	—	N·m
TH015	●	1.5	35	30	—	—	—	—
TH020	●	2	35	39	—	—	—	—
TH025	●	2.5	35	39	—	—	—	—

Wing Wrench (Hex)



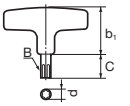
Cat. No.	Stock	Dimensions (mm) B	C	b1	b2	—	—	N·m
TSW040	●	4	60	20	40	—	—	—

Wing Wrench (Torx Plus)



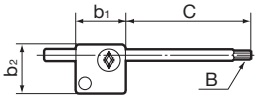
Cat. No.	Stock	Dimensions (mm) B	d	C	b1	b2	—	N·m
TRXW10IP	●	10IP	2.6	40	75	40	—	—

T-Shaped Wrench (Torx)



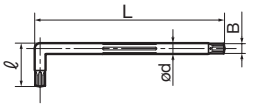
Cat. No.	Stock	Dimensions (mm) B	d	C	b1	—	—	N·m
TTX15W	●	T15	4	97	28	—	—	—
TTX20	●	T20	3.9	58	47	—	—	—
TT25	●	T25	4.4	27	48	—	—	—
TT27	●	T27	5	41	48	—	—	—

Torx Wrench



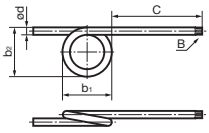
Cat. No.	Stock	Dimensions (mm) B	C	b1	b2	—	—	N·m
TRX06	●	T6	35.5	15	15	—	—	—
TRX08	●	T8	38.5	19	19	—	—	—
TRX10	●	T10	42.1	22	22	—	—	—
TRX15	●	T15	46	22	27	—	—	—
TRX20	●	T20	49	22	30	—	—	—

Torx Wrench



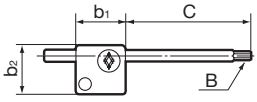
Cat. No.	Stock	Dimensions (mm) B	d	L	ℓ	—	—	N·m
RT06	●	2-1.8	2	35	8	—	—	—
RT08	●	2-2.1	2.1	35	8	—	—	—

Torx Wrench



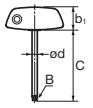
Cat. No.	Stock	Dimensions (mm) d	C	b1	b2	B	—	N·m
RT10	●	3	37	20	20	2.9	—	—

Torx Plus Wrench



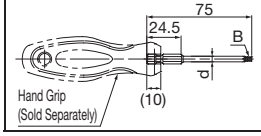
Cat. No.	Stock	Dimensions (mm) B	C	b1	b2	—	—	N·m
TRX06IP	●	6IP	34	15	15	—	—	—

T-Shaped Wrench (Torx Plus)



Cat. No.	Stock	Dimensions (mm) B	d	C	b1	—	—	N·m
TTR15IP	●	15IP	4	80	25.5	—	—	—

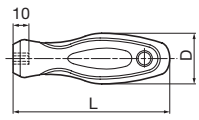
Bit (Removable Wrench Tip)



Cat. No.	Stock	Dimensions (mm) B	d	—	—	—	—	N·m
TRB10IP	●	10IP	4	—	—	—	—	—
TRB15IP	●	15IP	4	—	—	—	—	—
TRB20IP	●	20IP	4.5	—	—	—	—	—
TRB25IP	●	25IP	5	—	—	—	—	—

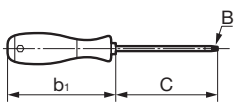
■ Wrenches

Hand Grip (Removable Handle)



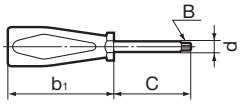
Cat. No.	Stock	Dimensions (mm) D	L	Remarks	N·m
HPS1015	●	32	99.4	For 10IP and 15IP	—
HPL2025	●	35.5	110.3	For 20IP and 25IP	—

Torx Plus Wrench (Screwdriver type)



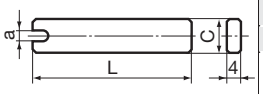
Cat. No.	Stock	Dimensions (mm) B	C	b1	—	—	—	N·m
TRDR08IP	●	8IP	60	104	—	—	—	—
TRDR10IP	●	10IP	80	111	—	—	—	—
TRDR15IP	●	15IP	80	111	—	—	—	—
TRDR20IP	●	20IP	100	118	—	—	—	—
TRDR25IP	●	25IP	100	118	—	—	—	—

Torx Wrench (Screwdriver type)



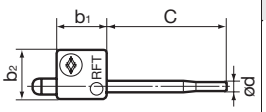
Cat. No.	Stock	Dimensions (mm) B	d	C	b1	—	—	N·m
TRD07	●	T7	2	45	70	—	—	—
TRD08	●	T8	2.3	55	70	—	—	—
TRD15	●	T15	3.3	70	100	—	—	—
TRD20	●	T20	3.9	100	90	—	—	—
TRD25	●	T25	5.3	80	110	—	—	—

Key Wrench



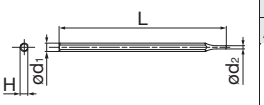
Cat. No.	Stock	Dimensions (mm) L	a	C	—	—	—	N·m
KY25	●	45	2.5	10	—	—	—	—
KY40	●	60	4	13	—	—	—	—

Socket Wrench (Wrench for Axial Adjustment Operation)



Cat. No.	Stock	Dimensions (mm) d	C	b1	b2	—	—	N·m
RFT	●	1.7	35	15	15	—	—	—

Socket Wrench

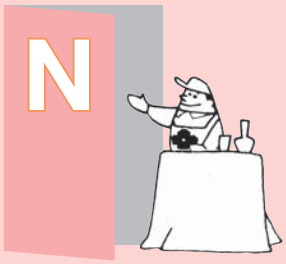


Cat. No.	Stock	Dimensions (mm) d1	d2	L	H	—	—	N·m
ANT	●	5	2	100	4.5	—	—	—

N·m Recommended Tightening Torque (N·m)

Technical Guidance Reference
N9 to N40

N



Technical Guidance
- Turning Edition ····· N10
- Milling Edition ····· N15
- Endmilling Edition ····· N19
- Drilling Edition ····· N22
- SUMIBORON Edition ····· N27

References
- SI Unit Conversion List ····· N31
- Metals Symbols Chart (Excerpt) ····· N32
- Steel and Non-Ferrous Metal Symbol Chart (Excerpt) ··· N34
- Hardness Scale Comparison Chart ····· N35
- Dimensional Tolerance of Standard Fittings ···· N36
- Dimensional Tolerance and Fittings ····· N38
- Standard of Tapers ····· N39
- Surface Roughness ····· N40

Turning Edition - The Basic of Turning

■ Calculating Cutting Speed

(1) Calculating spindle speed from cutting speed

$$n = \frac{1{,}000 \times v_c}{\pi \times D_m}$$

n : Spindle Speed (min^{-1})
v_c : Cutting speed (m/min)
D_m : Inner/outer diameter of workpiece (mm)
π : ≈ 3.14

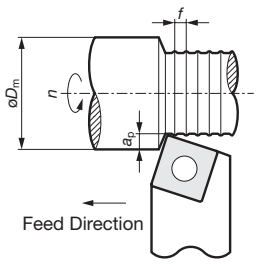
Example: v_c=150m/min, D_m=100mm

$$n = \frac{1{,}000 \times 150}{3.14 \times 100} = 478\ (min^{-1})$$

(2) Calculating cutting speed from spindle speed

$$v_c = \frac{\pi \times D_m \times n}{1{,}000}$$

Refer to the above table



- n : Spindle speed (min^{-1})
- v_c : Cutting speed (m/min)
- f : Feed rate per revolution (mm/rev)
- a_p : Depth of cut (mm)
- D_m : Diameter of workpiece (mm)

■ Calculating Power Requirements

$$P_c = \frac{v_c \times f \times a_p \times k_c}{60 \times 10^3 \times \eta}$$

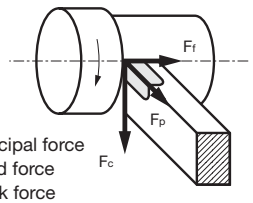
$$H = \frac{P_c}{0.75}$$

P_c : Power requirements (kW)
v_c : Cutting speed (m/min)
f : Feed rate (mm/rev)
a_p : Depth of cut (mm)
k_c : Specific cutting force (MPa)
H : Required horsepower (HP)
η : Machine efficiency (0.70 to 0.85)

● Rough value of kc

Aluminum: 800MPa
General steel: 2,500 to 3,000MPa
Cast iron: 1,500MPa

■ Three Cutting Force Components



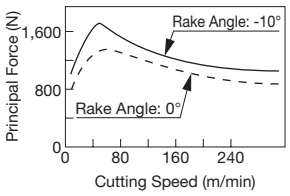
F_c: Principal force
F_f: Feed force
F_p: Back force

● Calculating cutting force

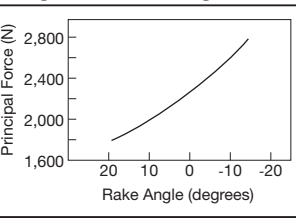
$$P = \frac{k_c \times q}{1{,}000} = \frac{k_c \times a_p \times f}{1{,}000}$$

P : Cutting force (kN)
k_c : Specific cutting force (MPa)
q : Chip area (mm^2)
a_p : Depth of cut (mm)
f : Feed rate (mm/rev)

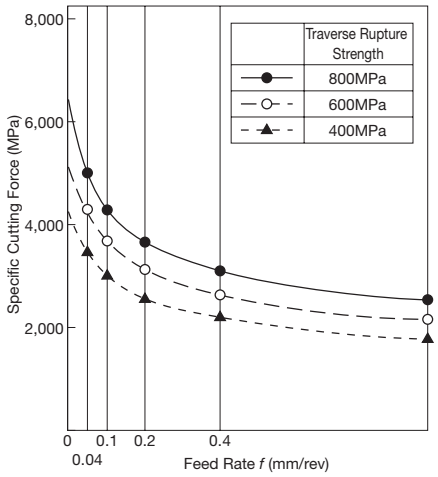
■ Relation Between Cutting Speed and Cutting Force



■ Relation between rake angle and cutting force



■ Relation Between Feed Rate and Specific Cutting Force (for carbon steel)



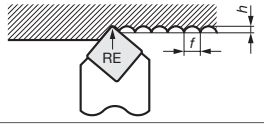
When feed rate decreases, specific cutting force increases.

■ Machined Surface Roughness

● Theoretical (geometrical) surface roughness

$$h = \frac{f^2}{8 \times RE} \times 10^3$$

h : Theoretical surface roughness (μm)
f : Feed rate per revolution (mm/rev)
RE : Corner radius (mm)



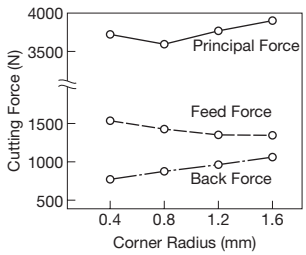
● Actual surface roughness

Steel:
Theoretical roughness × 1.5 to 3
Cast iron:
Theoretical roughness × 3 to 5

● Ways to improve surface finish roughness

(1) Use an insert with a larger corner radius.
(2) Optimise the cutting speed and feed rate so that built-up edge do not occur.
(3) Select an appropriate insert grade.
(4) Use a wiper insert.

■ Relation between corner radius and 3-part force

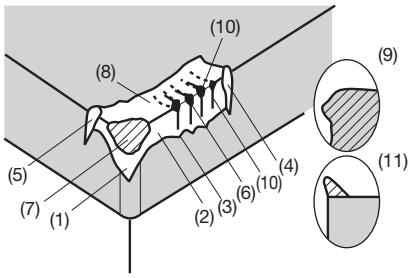


Large corner radius increases back force.

Work Material: SCM440 (38HS)
Insert: TNGA2204SS
Holder: PTGNR2525-43
Cutting Conditions: v_c=100m/min,
a_p=4mm,
f =0.45mm/rev

Turning Edition - Forms of Tool Failure and Tool Life

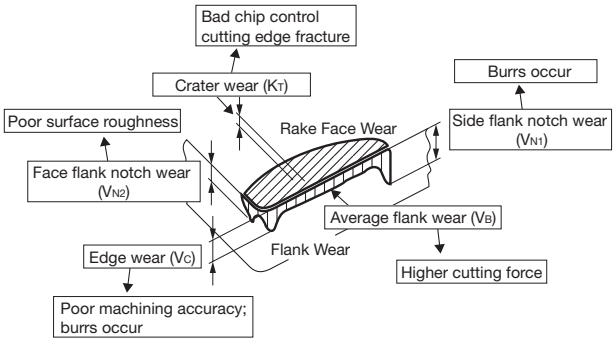
■ Forms of Tool Failure

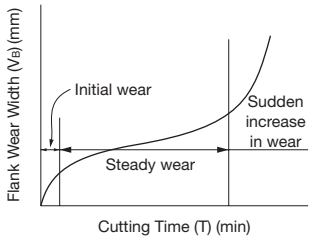
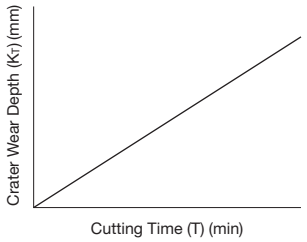


Classification	No.	Name of Failure	Major Causes of Failure
Failure Caused by Mechanical Factors	(1) to (5)	Flank wear	Wear caused by the scratching effect of hard grains contained in the work material
	(6)	Chipping	Fine breakages caused by high cutting loads or vibration
	(7)	Fracture	Large breakage caused by the impact of an excessive mechanical force acting on the cutting edge
Failure Caused by Thermal and Chemical Reactions	(8)	Crater wear	Cutting chips removing tool material as it flows over its top rake at high temperatures
	(9)	Plastic deformation	Deformation of cutting edge due to softening at high temperatures
	(10)	Thermal cracking	Fatigue from rapid, repeated heating and cooling cycles during interrupted cutting
	(11)	Built-up edges	Work material is pressure welded on the top face of the cutting edge

■ Tool Wear Curve

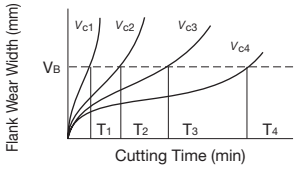
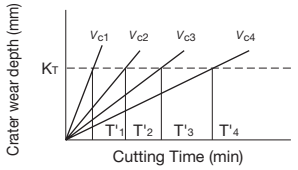
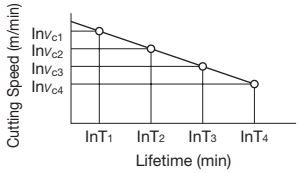
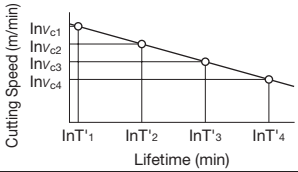
Forms of Tool Wear



Flank wear	Crater wear on rake face
	
· Wear increases rapidly right after starting cutting, then moderately and proportionally, and then rapidly again after a certain value.	· Wear increases proportionately to the cutting time.

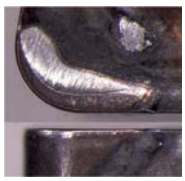
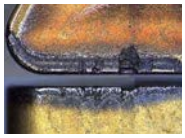
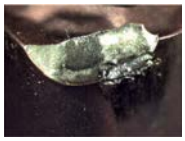
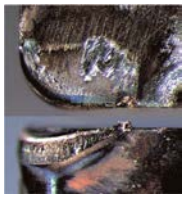
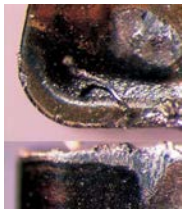
■ Tool Life (V-T)

· This double logarithm graph shows the relative tool life (T) with the specified wear over a range of cutting speeds (Vc) on the X axis, and the cutting speed along the Y axis.

	Flank wear	Crater wear
Tool wear		
Tool life		

Turning Edition - Cutting Edge Failure and Countermeasures

■ Insert Failure and Countermeasures

Insert Failure	Cause	Countermeasures
Flank Wear	· Tool grade lacks wear resistance. · Cutting speed is too fast. · Feed rate is far too slow.	· Select a more wear-resistant grade. P30→P20→P10 K20→K10→K01 · Increase rake angle. · Decrease cutting speed. · Increase feed rate.
Crater Wear 	· Tool grade lacks crater wear resistance. · Rake angle is too small. · Cutting speed is too fast. · Feed rate and depth of cut are too large.	· Select a more crater wear-resistant grade. · Increase rake angle. · Change the chipbreaker. · Decrease cutting speed. · Reduce feed rate and depth of cut.
Cutting Edge Chipping 	· Tool grade lacks toughness. · Cutting edge breaks due to chip adhesion. · Cutting edge is not strong enough. · Feed rate and depth of cut are too large.	· Select a tougher grade. P10→P20→P30 K01→K10→K20 · Increase amount of honing on cutting edge. · Reduce rake angle. · Reduce feed rate and depth of cut.
Cutting Edge Fracture 	·Tool grade lacks toughness. · Cutting edge is not strong enough. · Holder is not strong enough. · Feed rate and depth of cut are too large.	· Select a tougher grade. P10→P20→P30 K01→K10→K20 · Select a chipbreaker with a strong cutting edge. · Select a holder with a larger approach angle. · Select a holder with a larger shank size. · Reduce feed rate and depth of cut.
Adhesion/Built-up Edges	· Inappropriate grade selection. · Cutting edge is not sharp enough. · Cutting speed is too slow. · Feed rate is too slow.	·Select a grade with less affinity to the work material. Coated carbide or cermet grades. · Select a grade with a smooth coating. · Increase rake angle. · Reduce honing. · Increase cutting speed. · Increase feed rate.
Plastic Deformation 	· Tool grade lacks thermal resistance. · Cutting speed is too fast. · Feed rate and depth of cut are too large. · Not enough coolant.	· Select a more crater wear-resistant grade. · Increase rake angle. · Decrease cutting speed. · Reduce feed rate and depth of cut. · Supply sufficient coolant.
Notch Wear 	· Tool grade lacks wear resistance. · Rake angle is too small. · Cutting speed is too fast.	· Select a more wear-resistant grade. P30→P20→P10 K20→K10→K01 · Increase rake angle. · Alter depth of cut to shift the notch location.

Turning Edition - Chip Control and Countermeasures

■ Type of Chip Generation

	Flowing	Shearing	Tearing	Cracking
Type				
Condition	Continuous chips with good surface finish.	Chip is sheared and separated by the shear angle.	Chips appear to be torn from the surface.	Chips crack before reaching the cutting point.
Application	General cutting of steel and light alloy	Steel, stainless steel (low speed)	Steel, cast iron (very low speed, very small feed rate)	Cutting of general cast iron and carbon
Influence factor	Large ← Deformation of work material → Small Large ← Rake angle → Small Small ← Depth of cut → Large Large ← Cutting speed → Small			

■ Type of Chip Control

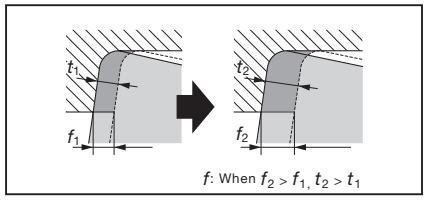
		Depth of Cut	A	B	C	D	E
Classification of chip shapes		Large					
		Small					
Evaluation	NC lathe (for automation)		×	×	○	○	△
	General-purpose lathe (for safety)		×	○	○	○ to △	×

Good: C type, D type

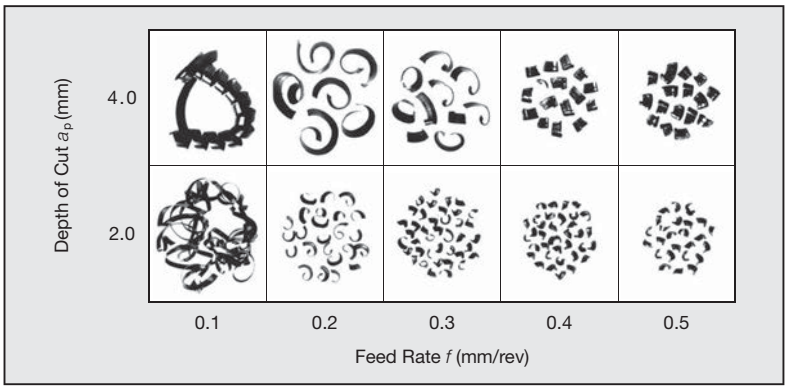
Poor
- A type: Twines around the tool or workpiece, damaging the machined surface and affecting safety.
- B type: Causes problems in the automatic chip conveyor and chipping occurs easily.
- E type: Causes spraying of chips and poor surface finish due to chattering, along with chipping, large cutting force and high temperatures.

■ Chip Control Improvement Factors

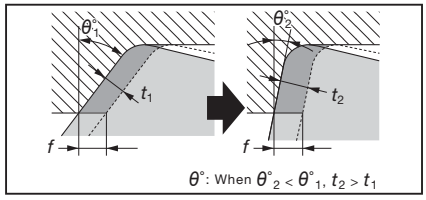
(1) Increase feed rate (*f*)



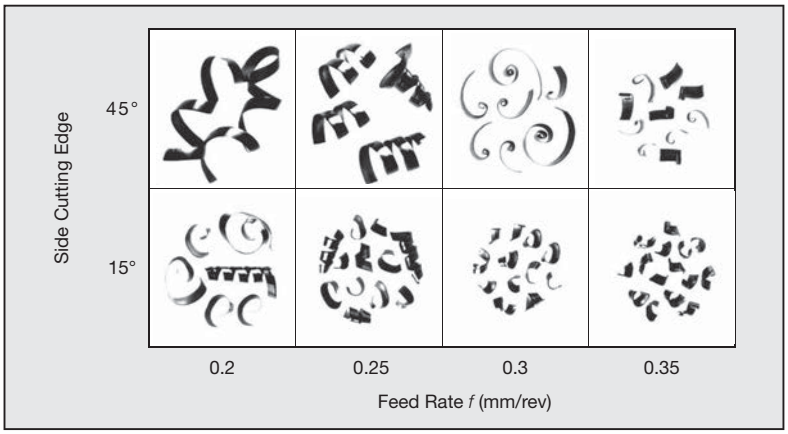
When the feed rate increases, the chip thickness (t) increases and chip control improves.



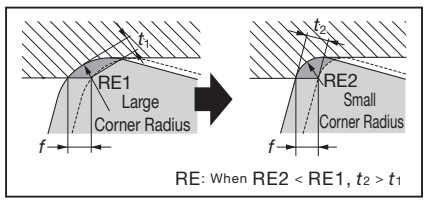
(2) Decrease side cutting edge (θ°)



Even if the feed rate is the same, a smaller side cutting edge angle makes chips thicker and chip control improves.

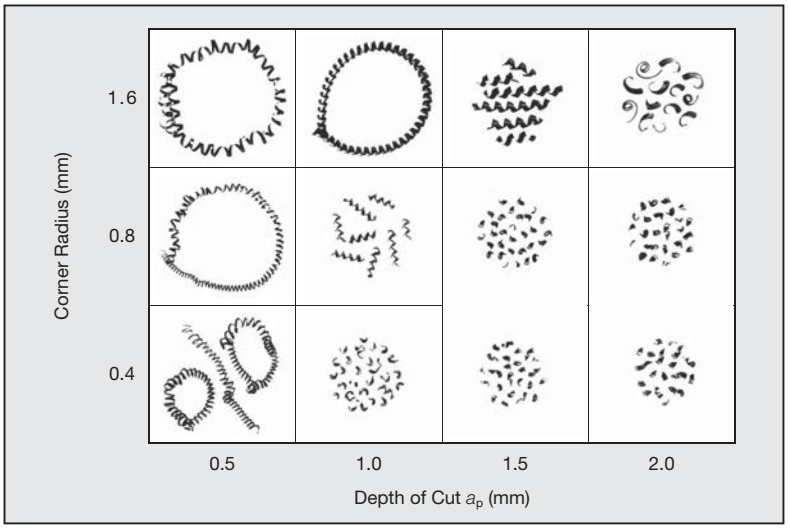


(3) Reduce corner radius (RE)



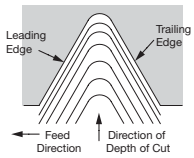
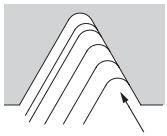
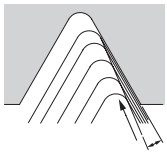
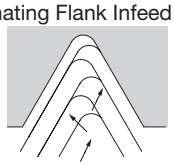
Even if the feed rate is the same, a smaller corner radius makes chips thicker and chip control improves.

* Cutting force increases proportionately to the length of the contact surface.
Therefore, a larger corner radius increases back force which induces chattering.
A smaller corner radius produces a rougher surface finish at the same feed rate.



Turning Edition - The Basics of Threading

■ Thread Cutting Methods

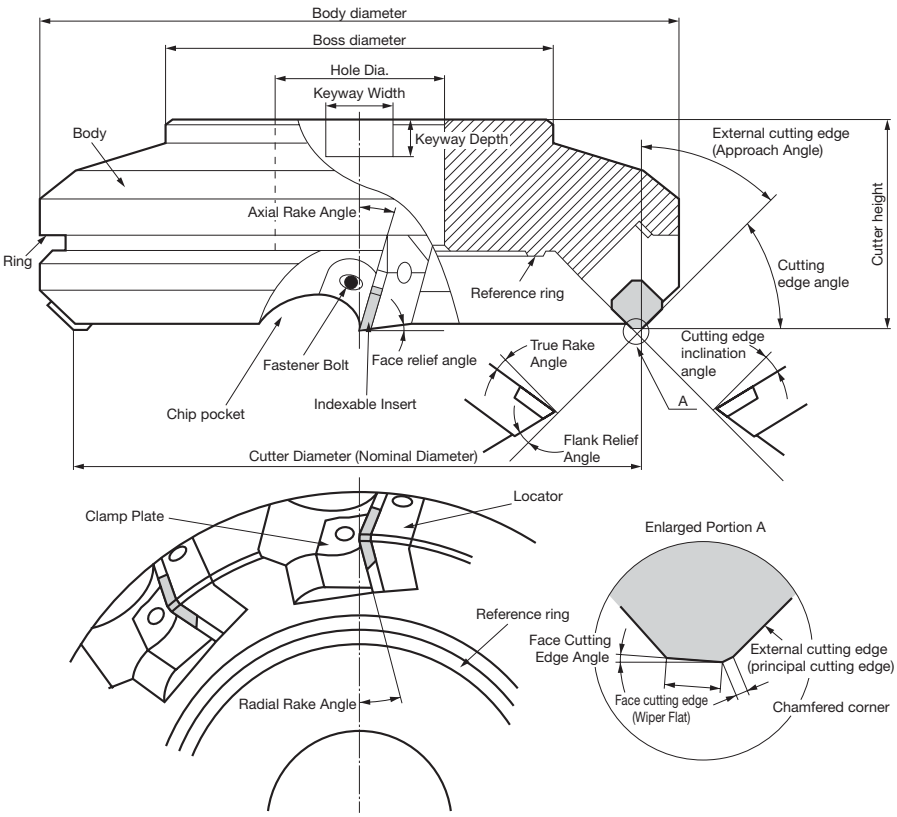
Cutting Method	Features
Radial Infeed 	· Most common threading technique, used mainly for small-pitched threads. · Easy to change cutting conditions such as depth of cut, etc. · Long contact point has a tendency to chatter. · Chip control is difficult. · Considerable damage tends to occur on the trailing edge side.
Flank Infeed 	· Effective for large-pitched threads and blemish-prone work material surfaces. · Chips evacuate from one side for good chip control. · The trailing edge is subjected to rubbing resulting in accelerated flank wear.
Modified Flank Infeed 	· Effective for large-pitched threads and blemish-prone work material surfaces. · Chips evacuate from one side for good chip control. · Inhibits flank wear on trailing edge side.
Alternating Flank Infeed 	· Effective for large-pitched threads and blemish-prone work material surfaces. · Wears evenly on right and left cutting edges. · Since both edges are used alternately, chip control is sometimes difficult.

■ Troubleshooting for Threading

	Failure	Cause	Countermeasures
Cutting Edge Failure	Excessive Wear	· Tool grade	· Select a more wear-resistant grade
		· Cutting conditions	· Reduce cutting speed · Use a suitable quantity and concentration of coolant · Change the number of passes
	Uneven Wear on Right and Left Sides	· Tool mounting	· Check whether the cutting edge inclination angle is appropriate for the thread lead angle · Check whether the tool is mounted properly
		· Cutting conditions	· Change to modified flank infeed or alternating flank infeed
	Chipping	· Cutting conditions	· If built-up edge occurs, increase the cutting speed
	Fracture	· Biting of chips	· Supply enough coolant to the cutting edge
		· Cutting conditions	· Increase the number of passes and reduce the depth of cut for each pass · Use separate tools for roughing and finishing
Shape and Accuracy	Poor Surface Finish Roughness	· Cutting conditions	· If blemished due to low-speed machining, increase the cutting speed · If chattering occurs, decrease the cutting speed · If the depth of cut of the final pass is too small, make it larger
		· Tool grade	· Select a more wear-resistant grade
		· Inappropriate cutting edge inclination angle	· Select the correct shim to ensure relief on the side of the insert
	Inappropriate Thread Shape	· Tool mounting	· Check whether the tool is mounted properly
	Shallow Thread Depth	· Shallow depth of cut	· Check the depth of cut
		· Tool wear	· Check damage to the cutting edge

Milling Edition - The Basics of Milling

■ Parts



■ Milling Calculation Formulas

● Calculating cutting speed

$$v_c = \frac{\pi \times DC \times n}{1{,}000}$$

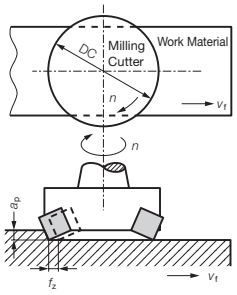
$$n = \frac{1{,}000 \times v_c}{\pi \times DC}$$

● Calculating feed rate

$$v_f = f_z \times z \times n$$

$$f_z = \frac{v_f}{z \times n}$$

v_c : Cutting speed (m/min)
π : ≈3.14
DC: Nominal cutting diameter (mm)
n : Rotation speed (min^{-1})
v_f : Feed rate per minute (mm/min)
f_z : Feed rate per tooth (mm/t)
z : Number of teeth



● Calculating power requirements

$$P_c = \frac{a_e \times a_p \times v_f \times k_c}{60 \times 10^6 \times \eta} = \frac{Q \times k_c}{60 \times 10^3 \times \eta}$$

P_c: Power consumption (kw)
H : Required horsepower (HP)
Q : Chip evacuation amount (cm^3/min)
a_e : Cutting width (mm)
v_f : Feed rate per minute (mm/min)
a_p : Depth of cut (mm)
k_c : Cutting force (MPa)
Rough values (Steel: 2,500 to 3,000MPa / Cast iron: 1,500MPa / Aluminum: 800MPa)
η : Machine efficiency (about 0.75)

● Calculating horsepower requirements

$$H = \frac{P_c}{0.75}$$

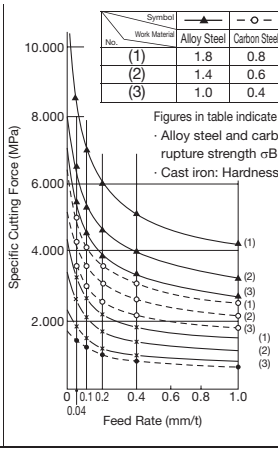
● Calculating chip evacuation amount

$$Q = \frac{a_e \times a_p \times v_f}{1{,}000}$$

● Relation between feed rate, work material and specific cutting force

No. \ Symbol / Work Material	Alloy Steel	Carbon Steel	Cast Iron	Aluminum Alloy
(1)	1.8	0.8	200	—
(2)	1.4	0.6	160	—
(3)	1.0	0.4	120	—

Figures in table indicate these characteristics.
· Alloy steel and carbon steel: Traverse rupture strength σB (GPa)
· Cast iron: Hardness HB

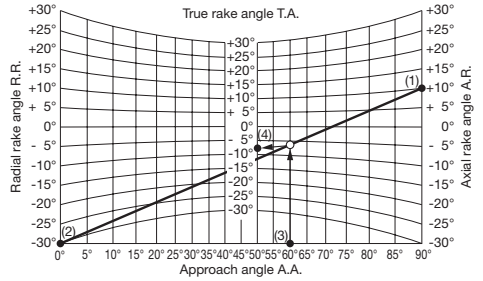


Milling Edition - The Basics of Milling

■ Functions of Cutting Edge Angles

	Material	Symbol	Function	Effect
(1) (2)	Axial rake angle Radial rake angle	A.R. R.R.	Determines chip evacuation direction, adhesion, thrust, etc.	Available in positive to negative (large to small) rake angles. Typical combinations: Positive and Negative, Positive and Positive, Negative and Negative
(3)	Approach angle	A.A.	Determines chip thickness and chip evacuation direction	Large: Thin chips Small cutting force
(4)	True rake angle	T.A.	Effective rake angle	Positive (Large): Excellent machinability and low chip adhesion. Low cutting edge strength. Negative (Small): Strong cutting edge and easy chip adhesion.
(5)	Cutting edge inclination angle	I.A.	Determines chip control direction	Positive (Large): Excellent chip control and small cutting force. Low cutting edge strength.
(6)	Face cutting edge angle	F.A.	Determines surface finish roughness	Small: Excellent surface roughness.
(7)	Relief angle		Determines cutting edge strength, tool life, chattering	

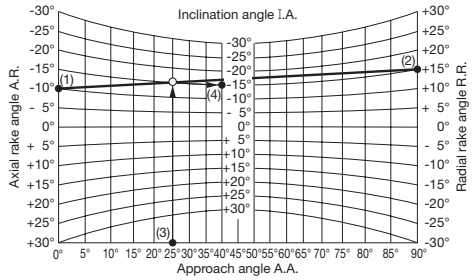
True rake angle (T.A.) table



Example: (1) A.R. (Axial rake angle) = +10°
(2) R.R. (Radial rake angle) = - 30°
(3) A.A. (Approach angle) = 60°
-> (4) T.A. (True rake angle) = -8°

Formula: tan T.A.=tan R.R./cos A.A. + tan A.R./sin A.A.

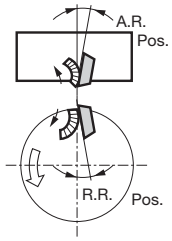
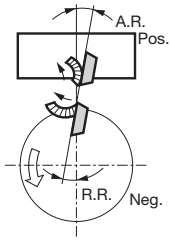
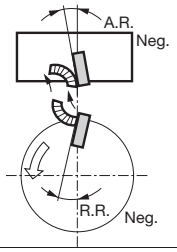
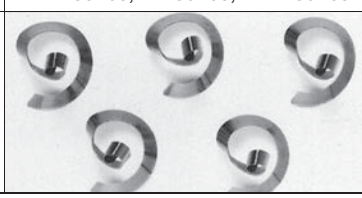
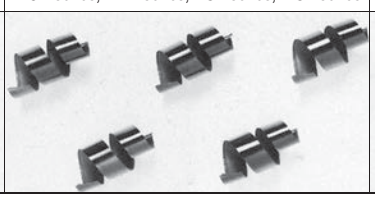
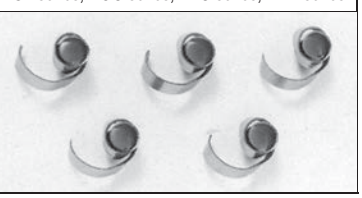
Inclination angle (I.A.) chart



Example: (1) A.R. (Axial rake angle) = - 10°
(2) R.R. (Radial rake angle) = +15°
(3) A.A. (Approach angle) = 25°
-> (4) I.A. (inclination angle) = -15°

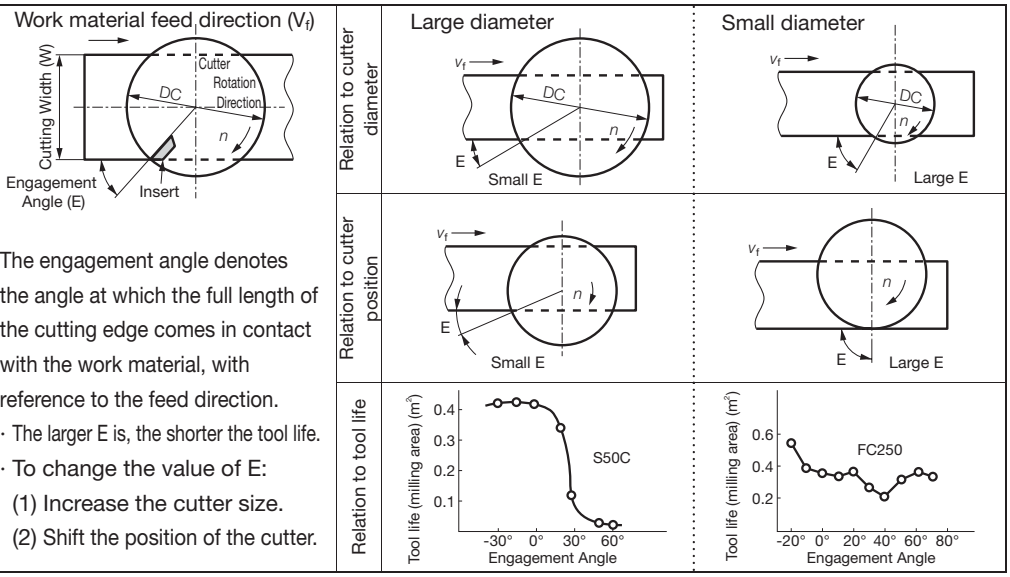
Formula: tan I.R.=tan A.R./cos A.A. - tan R.R./sin A.A.

■ Rake Angle Combination and Features

	Double Positive type	Negative - Positive type	Double Negative type
Edge combination and chip evacuation (A.R.: Axial rake angle R.R : Radial rake angle : Chip and evacuation direction : Cutter rotation direction)			
Advantages	Good sharpness	Excellent chip evacuation and sharpness	Economical design enabling use of both sides of insert Strong cutting edge
Disadvantages	Only single-sided inserts with a lower cutting edge strength can be used	Only single-sided inserts can be used	Dull cutting action
Applications	Machining of aluminum alloy and other materials requiring sharpness	Machining of steel, cast iron, and stainless steel, with suitable strength and good evacuation	For hard materials such as cast iron or poor surfaces such as castings
Cat. No.	ANX series, HF series, WAX series	WGX series, WFX series, RSX series, MSX series	TSX series, DGC series, DFC series, DNX series
Chips (Ex.) ・Work material: SCM435 ・v_c=130m/min f_z=0.23mm/t a_p=3mm			

Milling Edition - The Basics of Milling

■ Relation between engagement angle and tool life

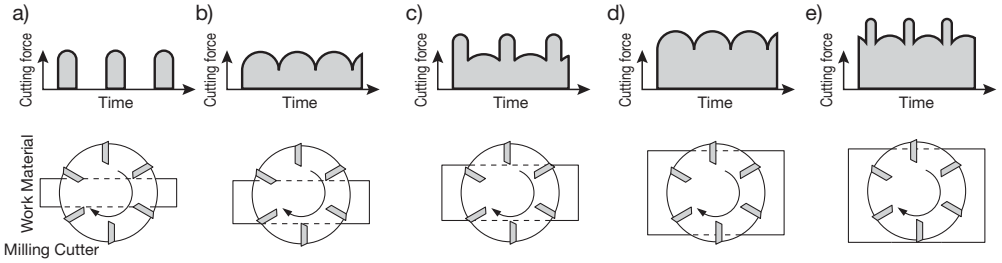


The engagement angle denotes the angle at which the full length of the cutting edge comes in contact with the work material, with reference to the feed direction.

- The larger E is, the shorter the tool life.
- To change the value of E:
  (1) Increase the cutter size.
  (2) Shift the position of the cutter.

● Relation between the number of simultaneously engaged cutting edges and cutting force

Normally, a cutting width 70 to 80% of the cutter diameter is considered appropriate, as shown in example d). However, this may not apply due to the actual rigidity of the machine or workpiece, and the machine horsepower.



- a) 0 or 1 edge in contact at same time.
- b) Only 1 edge in contact at any time.
- c) 1 or 2 edges in contact.
- d) 2 edges in contact at any time.
- e) 2 to 3 edges in contact.

■ Improving surface roughness

(1) Inserts with wiper flat

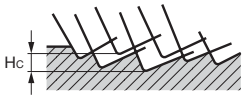
When all of the cutting edges have wiper flats, a few teeth protrude due to inevitable runout and act as wiper inserts.

- Insert equipped with straight wiper flat
  (Face angle: Around 15' to1°)
- Insert equipped with curved wiper flat
  (Curvature: ≈ R500 (example))

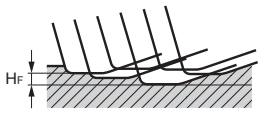
(2) **Wiper insert assembling system**

A system in which one or two inserts (wiper inserts) protrude with a smooth curved edge just a little beyond the other teeth to wipe the milled surface. (Applicable to WGX series, DGC series, etc.)

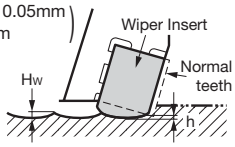
● Surface roughness without wiper flat



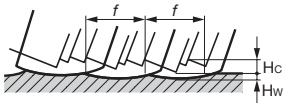
● Surface roughness with straight wiper flat



h: Projection value of wiper insert
(Cast Iron: 0.05mm
Al: 0.03mm)

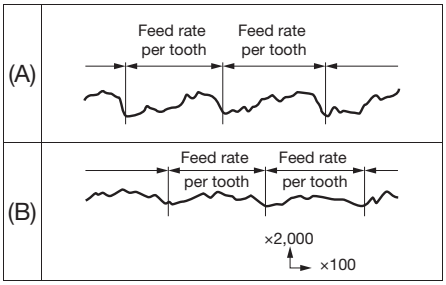


f: Feed rate per revolution (mm/rev)



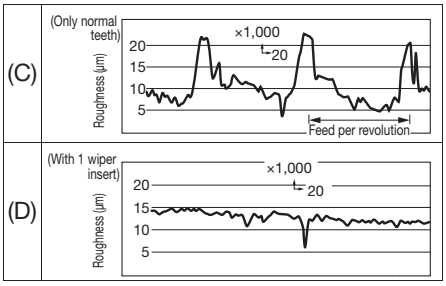
Hc: Surface roughness with only normal teeth
Hw: Surface roughness with wiper insert

● Surface roughness with wiper flat (difference in face cutting edge)



- Work material: SCM435
- Cutter: DPG5160R (per tooth)
- v_c = 154m/min
  f_z = 0.234mm/t
  a_p = 2mm
- Face Cutting Edge Angle
  (A): 28'
  (B): 6'

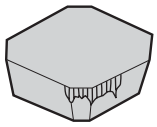
● Effects of wiper insert (example)

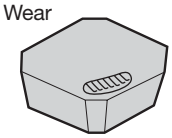
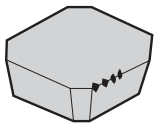


- Work material: FC250
- Cutter: DPG4100R
- Insert: SPCH42R
- Face runout: 0.015mm
- Runout: 0.04mm
  v_c = 105m/min
  f_z = 0.29mm/t
  (1.45 mm/rev)
- (C): Normal teeth
- (D): Per wiper edge

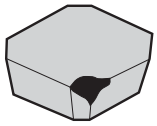
Milling Edition - Troubleshooting for Milling

■Troubleshooting for Milling

<table>
<tr><th colspan="2">Failure</th><th colspan="2">Basic Remedies</th><th>Countermeasure Examples</th></tr>
<tr><td rowspan="5">Cutting Edge Failure</td><td>Excessive Flank Wear
  </td><td>Tool Grade

Cutting Conditions</td><td>· Select a more wear-resistant grade.
Carbide (P30→P20 / K20→K10) → (Coated / Cermet)
· Decrease the cutting speed.
· Increase feed rate.</td><td>· Recommended Insert Grades
<table><tr><th></th><th>Steel</th><th>Cast Iron</th><th>Non-Ferrous Alloy</th></tr><tr><td>Finishing</td><td>T250A, T4500A (Cermet)</td><td>ACK100 (Coated)
BN7000 (SUMIBORON)</td><td>DA1000 (SUMIDIA)</td></tr><tr><td>Roughing</td><td>ACP100 (Coated)</td><td>ACK200 (Coated)</td><td>DL1000 (Coated)</td></tr></table></td></tr>
<tr><td>Excessive Crater Wear
  </td><td>Tool Grade
Tool Design
Cutting Conditions</td><td>· Select a crater-resistant grade.
· Use a sharp chipbreaker. (G → L)
· Decrease the cutting speed.
· Reduce depth of cut and feed rate.</td><td>· Recommended Insert Grades
<table><tr><th></th><th>Steel</th><th>Cast Iron</th><th>Non-Ferrous Alloy</th></tr><tr><td>Finishing</td><td>T250A, T4500A (Cermet)</td><td>ACK100 (Coated)</td><td>DA1000 (SUMIDIA)</td></tr><tr><td>Roughing</td><td>ACP100 (Coated)</td><td>ACK200 (Coated)</td><td>DL1000 (Coated)</td></tr></table></td></tr>
<tr><td>Chipping
  </td><td>Tool Grade

Tool Design

Cutting Conditions</td><td>· Use a tougher grade.
P10→P20→P30
K01→K10→K20
· Select a negative/positive cutter with a large peripheral cutting edge angle (a small approach angle).
· Reinforce the cutting edge (honing).
· Select a stronger chipbreaker. (G → H)
· Reduce feed rate.</td><td>· Recommended Insert Grades
<table><tr><th></th><th>Steel</th><th>Cast Iron</th></tr><tr><td>Finishing</td><td>ACP200 (Coated)</td><td>ACK200 (Coated)</td></tr><tr><td>Roughing</td><td>ACP300 (Coated)</td><td>ACK300 (Coated)</td></tr></table>· Recommended cutter: SEC-WaveMill WGX series
· Cutting conditions: Refer to H22</td></tr>
<tr><td>Fracture
  </td><td>Tool Grade

Tool Design

Cutting Conditions</td><td>· If it is due to excessive low speeds or very low feed rates, select a grade resistant to adhesion.
· If the cause is thermal cracking, select a thermal impact resistant grade.
· Select a negative/positive (or double negative) cutter type with a large peripheral cutting edge angle (a small approach angle).
· Reinforce the cutting edge (honing).
· Select a stronger chipbreaker. (G → H)
· Increase insert size (thickness in particular).
· Select appropriate conditions for that particular application.</td><td>· Recommended Insert Grade
<table><tr><th></th><th>Steel</th><th>Cast Iron</th></tr><tr><td>Roughing</td><td>ACP300 (Coated)</td><td>ACK300 (Coated)</td></tr></table>· Recommended cutter: SEC-WaveMill WGX series
· Insert Thickness: 3.18 → 4.76mm
· Chipbreaker type: Standard → Strong edge type
· Cutting conditions: Refer to H22</td></tr>
<tr><td rowspan="5">Others</td><td>Unsatisfactory Machined Surface Finish</td><td>Tool Grade

Tool Design

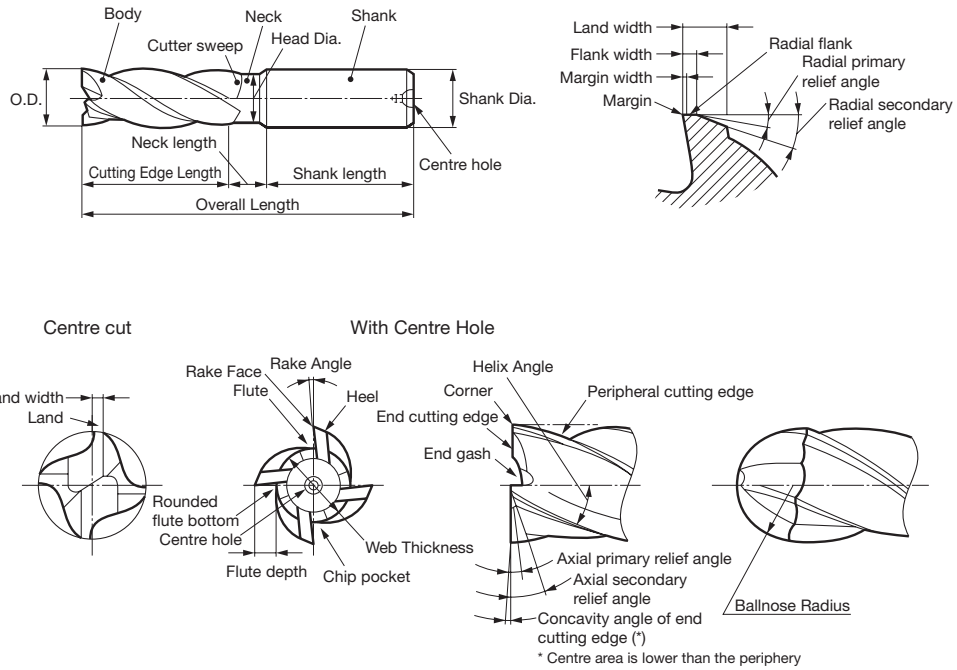
Cutting Conditions</td><td>· Select an adhesion-resistant grade.
Carbide → Cermet
· Improve axial runout of cutting edges.
(Use a cutter with less runout / Mount the correct insert)
· Use a wiper insert.
· Use cutters dedicated for finishing.
· Increase the cutting speed.</td><td>· Recommended Cutters and Insert Grades
<table><tr><th></th><th></th><th>Steel</th><th>Cast Iron</th><th>Non-Ferrous Alloy</th></tr><tr><td>General-purpose</td><td>Cutter Insert</td><td>WGX series* ACP200 (Coated)</td><td>DGC series ACK200 (Coated)</td><td>ANX series* DA1000 (SUMIDIA)</td></tr><tr><td>Finishing</td><td>Cutter Insert</td><td>WGX series T4500A (Cermet)</td><td>FMU series BN7000 (SUMIBORON)</td><td>ANX series DA1000 (SUMIDIA)</td></tr></table>Cutters marked with * can be mounted with wiper inserts.</td></tr>
<tr><td>Chattering</td><td>Tool Design

Cutting Conditions
Others</td><td>· Select a cutter with sharp cutting edges.
· Use an irregular pitched cutter.
· Reduce the feed rate.
· Improve the rigidity of the workpiece and cutter clamp.</td><td>· Recommended Cutters
For steel: SEC-WaveMill WGX series
For cast iron: SEC-Sumi Dual Mill DGC series
For light alloy: High-efficiency PCD Cutter for Aluminum Alloys ANX series</td></tr>
<tr><td>Unsatisfactory Chip Control</td><td>Tool Design</td><td>· Select a cutter with good chip evacuation features.
· Reduce number of teeth.
· Use a wide chip pocket.</td><td>· Recommended cutter: SEC-WaveMill WGX series</td></tr>
<tr><td>Edge Chipping On Workpiece</td><td>Tool Design

Cutting Conditions</td><td>· Increase the peripheral cutting edge angle (decrease the approach angle).
· Change the chipbreaker blade type. (G → L)
· Reduce the feed rate.</td><td>· Recommended cutter: SEC-WaveMill WGX series</td></tr>
<tr><td>Burr Formation</td><td>Tool Design
Cutting Conditions</td><td>· Use a sharp-edged cutter.
· Increase feed rate.
· Use a burr-proof insert.</td><td>· Recommended cutter: SEC-WaveMill WGX series + FG Chipbreaker
SEC-Sumi Dual Mill DGC series + FG Chipbreaker</td></tr>
</table>

Endmilling Edition - The Basics of Endmilling

■ Parts



■ Calculating Cutting Conditions (Square Endmill)

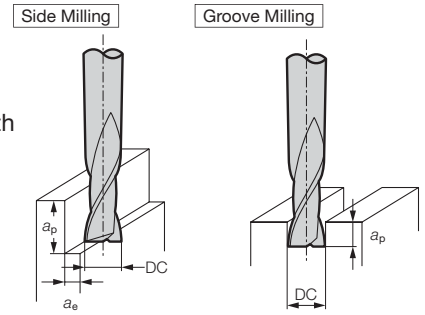
● Calculating cutting speed

$$v_c = \frac{\pi \times DC \times n}{1{,}000} \qquad n = \frac{1{,}000 \times v_c}{\pi \times DC}$$

● Calculating feed rate per revolution and per tooth

$$v_f = n \times f \qquad f = \frac{v_f}{n}$$

$$v_f = n \times f_z \times z \qquad f_z = \frac{f}{z} = \frac{v_f}{n \times z}$$

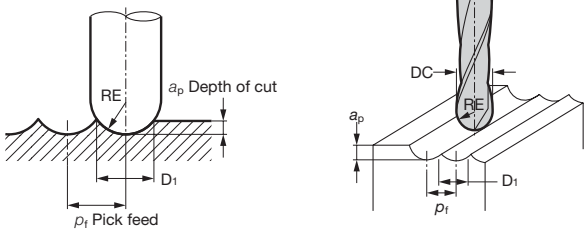


(Ballnose Endmill)

● Calculating notch width (D_1)

$$D_1 = 2 \times \sqrt{2 \times RE \times a_p - a_p^2}$$

● Cutting speed and feed rate (per revolution and per tooth) are calculated using the same formula as the square endmill.

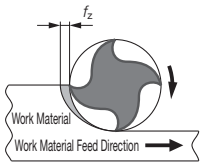


v_c	: Cutting speed (m/min)
π	: ≈3.14
DC	: Endmill diameter (mm)
n	: Spindle speed (min^{-1})
v_f	: Feed rate (mm/min)
f	: Feed rate per revolution (mm/rev)
f_z	: Feed rate per tooth (mm/t)
z	: Number of teeth
a_p	: Depth of cut in axial direction (mm)
a_e	: Depth of cut in radial direction (mm)
RE	: Ballnose radius

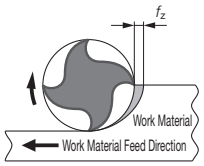
Endmilling Edition - The Basics of Endmilling

■ Up-cut and Down-cut

● Side milling

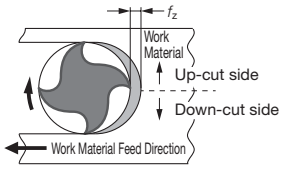


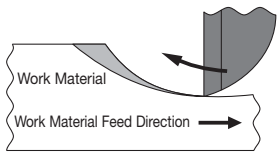
(a) Up-cut



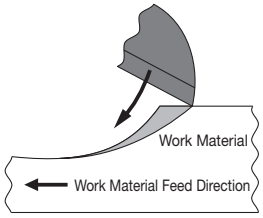
(b) Down-cut

● Slotting



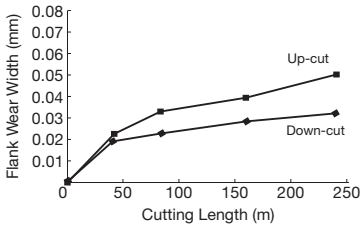


(a) Up-cut

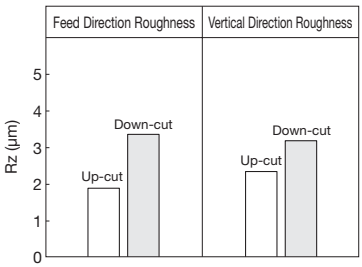


(b) Down-cut

● Cutting Edge Wear Amount



● Surface Roughness



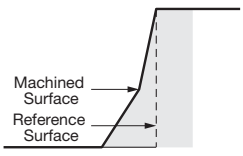
● Cutting Conditions

Work material: S50C
Tool: GSX21000C-2D
(ø10mm, 2 teeth)
Cutting
conditions: v_c=88m/min
(n=2800min^{-1})
v_f=560mm/min
(f_z=0.1mm/t)
a_p=15mm
a_e=0.5mm
Side milling
Dry, air

■ Relation Between Cutting Conditions and Deflection

Endmill specifications			Side milling Work Material: Pre-hardened steel (40HRC) Cutting conditions: v_c=25m/min, a_p=12mm, a_e=0.8mm		Grooving Work Material: Pre-hardened steel (40HRC) Cutting conditions: v_c=25m/min, a_p=8mm, a_e=8mm Up Cut side / Down Cut side	
Cat. No.	Number of Teeth	Helix Angle	Feed Rate 0.16mm/rev Style		Feed Rate 0.11mm/rev Style	
			Up-cut	Down-cut	Up-cut	Down-cut
GSX20800S-2D	2	30°				
GSX40800S-2D	4	30°				
Results			· The tool tip tends to back off with the down-cut. · The 4-flute type offers more rigidity and less backing off.			

Endmill specifications			Grooving			
			Feed Rate 0.05mm/rev Style		Feed Rate 0.03mm/rev Style	
Cat. No.	Number of Teeth	Helix Angle	Up-cut	Down-cut	Up-cut	Down-cut
GSX20800S-2D	2	30°				
GSX40800S-2D	4	30°				
Results			· The side of the slot tends to cut into the up-cut side toward the bottom of the slot. · The 4-flute type offers higher rigidity and less deflection.			



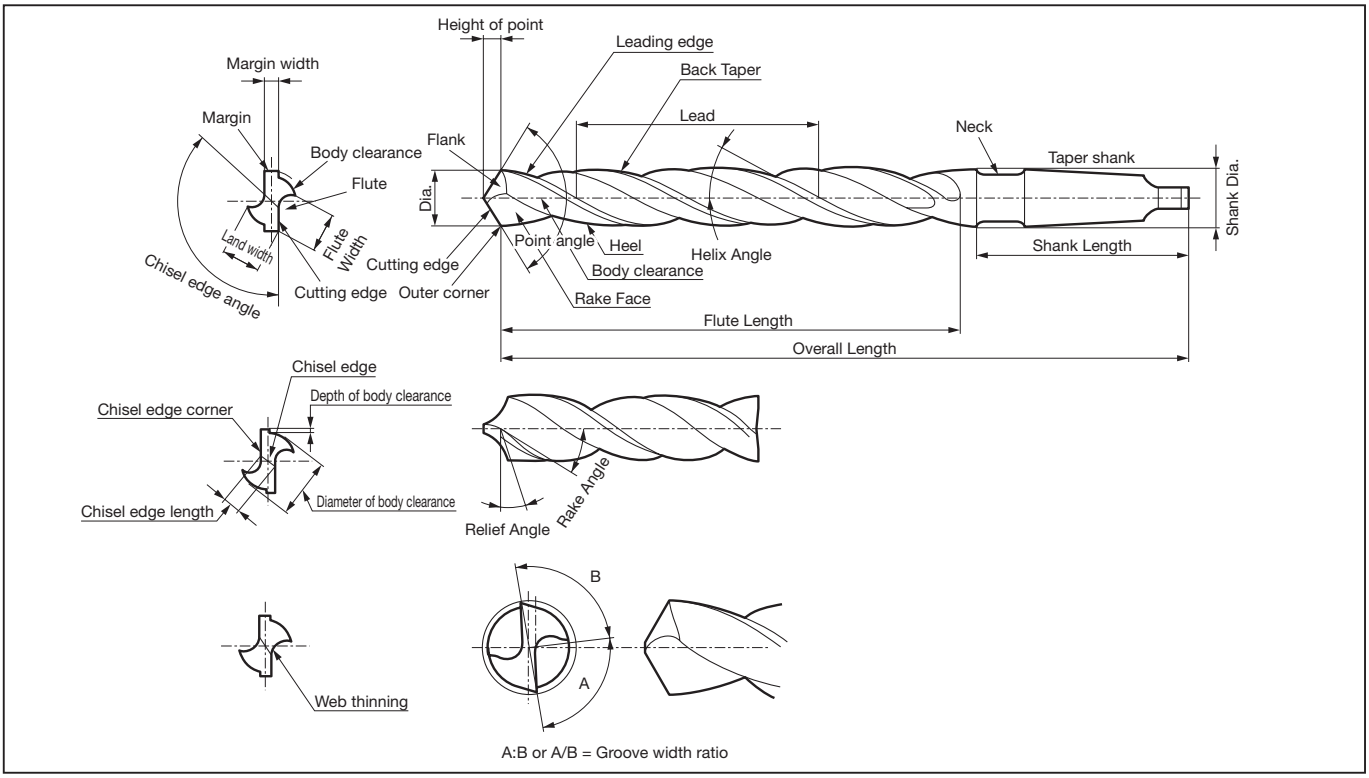
Endmilling Edition - Troubleshooting for Endmilling

■ Troubleshooting for Endmilling

Failure		Cause		Countermeasures
Cutting Edge Failure	Excessive Wear	· Cutting Conditions	· Cutting speed is too fast	· Decrease cutting speed and feed rate
			· Feed rate is too large	
		· Tool Shape	· The flank relief angle is too small	· Change to an appropriate flank relief angle
		· Tool Material	· Insufficient wear resistance	· Select a more wear-resistant substrate · Use a coated tool
	Chipping	· Cutting Conditions	· Feed rate is too large	· Decrease cutting speed
			· Depth of cut is too large	· Reduce depth of cut
			· Tool overhang is too long	· Adjust tool overhang to the correct length
		· Machine Area	· Workpiece clamping is too weak	· Clamp the workpiece firmly
			· Tool mounting is unstable	· Make sure the tool is seated in the chuck properly
	Fracture	· Cutting Conditions	· Feed rate is too large	· Decrease cutting speed
			· Depth of cut is too large	· Reduce depth of cut
			· Tool overhang is too long	· Reduce tool overhang as much as possible
			· Cutting edge is too long	· Select a tool with a shorter cutting edge
		· Tool Shape	· Web thickness is too small	· Change to more appropriate web thickness
Others	Deflection in Wall Surface	· Cutting Conditions	· Feed rate is too large	· Decrease cutting speed
			· Depth of cut is too large	· Reduce depth of cut
			· Tool overhang is too long	· Adjust tool overhang to the correct length
			· Cutting on the down-cut	· Change direction to up-cut
		· Tool Shape	· Helix angle is too large	· Use a tool with a smaller helix angle
			· Web thickness is too small	· Use a tool with the appropriate web thickness
	Unsatisfactory Machined Surface Finish	· Cutting Conditions	· Feed rate is too large	· Decrease cutting speed
			· Chip biting	· Use air blow
				· Use an insert with a larger relief pocket
	Chattering	· Cutting Conditions	· Cutting speed is too fast	· Decrease the cutting speed
			· Cutting on the up-cut	· Change direction to down-cut
			· Tool overhang is too long	· Adjust tool overhang to the correct length
		· Tool Shape	· Rake angle is too large	· Use a tool with an appropriate rake angle
		· Machine Area	· Workpiece clamping is too weak	· Clamp the workpiece firmly
			· Tool mounting is unstable	· Make sure the tool is seated in the chuck properly
	Chip Blockage	· Cutting Conditions	· Feed rate is too large	· Decrease cutting speed
			· Depth of cut is too large	· Reduce depth of cut
		· Tool Shape	· Too many teeth	· Reduce number of teeth
			· Chip biting	· Use air blow

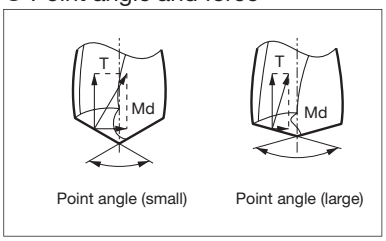
Drilling Edition - The Basics of Drilling

■ Drill Parts



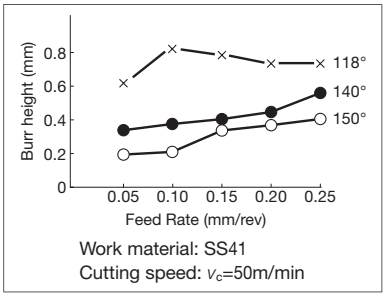
A:B or A/B = Groove width ratio

● Point angle and force



When point angle is large, thrust increases but torque decreases.

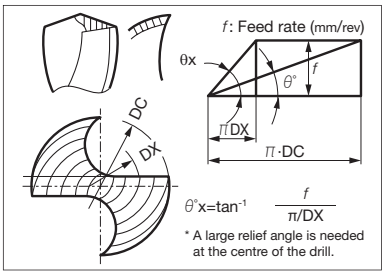
● Point angle and burrs



Work material: SS41
Cutting speed: v_c=50m/min

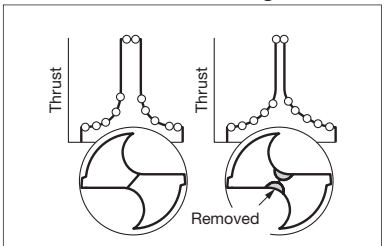
When point angle is large, burr height becomes low.

● Minimum requirement relief angle for drilling



* A large relief angle is needed at the centre of the drill.

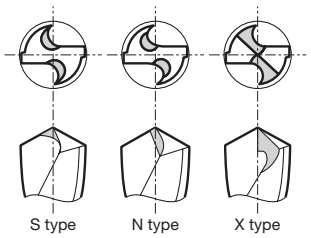
● Effects of web thinning



Web thinning decreases the thrust concentrated at the chisel edge, makes the drill edge sharp, and improves chip control.

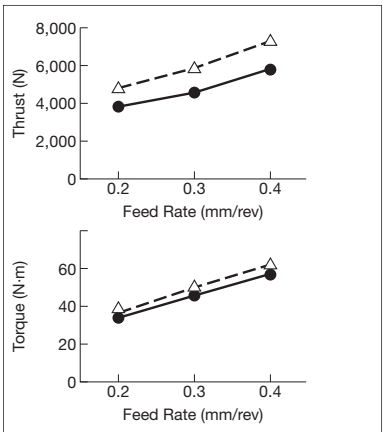
● Chisel width decreased by thinning

Typical types of thinning



S type: Standard type used for general-purposes.
N type: Suitable for thin web drills.
X type: For hard-to-cut materials or deep hole drilling. Entry easier.

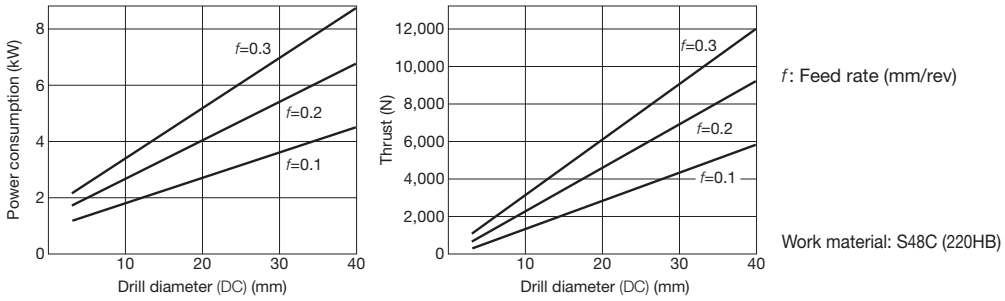
● Relation between edge treatment and cutting force



Drill: MULTIDRILL KDS215MAK
Edge treatment width: ●→0.15mm △→0.23mm
Work material: S50C (230HB)
Cutting conditions: v_c=50m/min Wet

Drilling Edition - The Basics of Drilling

■ Reference for Power Requirements and Thrust



■ Cutting Conditions Selection

● Control cutting force
For low-rigidity machines

The following table shows the relation between edge treatment width and cutting force. If the cutting force is too great and causes issues, take measures such as reducing the feed rate or reducing the cutting edge treatment of the drill.

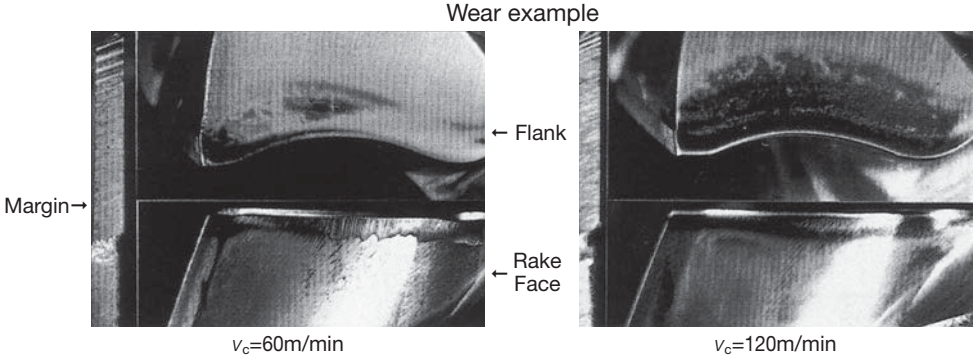
Drill diameter: ø10mm
Work material: S50C (230HB)

Cutting Conditions		Edge treatment width			
		0.15mm		0.05mm	
v_c (m/min)	f (mm/rev)	Torque (N/m)	Thrust (N)	Torque (N/m)	Thrust (N)
40	0.38	12.8	2,820	12.0	2,520
50	0.30	10.8	2,520	9.4	1,920
60	0.25	9.2	2,320	7.6	1,640
60	0.15	6.4	1,640	5.2	1,100

● High speed machining recommendation

If the machine has enough power and sufficient rigidity, reasonable tool life can be ensured even when adopting higher-efficiency machining. However, sufficient coolant must be supplied.

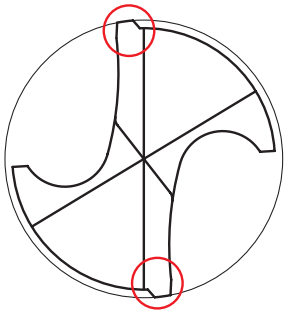
Wear example



Work material : S50C (230HB)
Cutting conditions: f = 0.3mm/rev
H=50mm
Tool life : 600 holes (Cutting length: 30m)

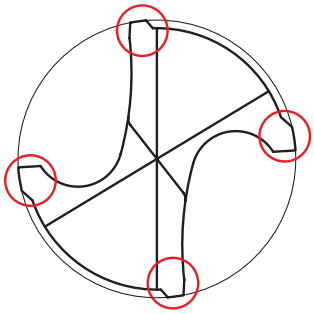
■ Explanation of Margins (Difference between single and double margins)

● Single Margin (2 guides: ○ part)



● Shape used on most drills

● Double Margin (4 guides: ○ part)

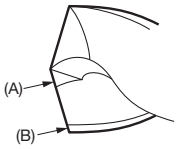


● 4-point guiding reduces hole bending and waviness for improved stability and accuracy during deep hole drilling.

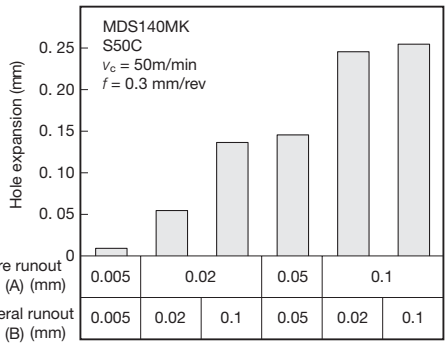
Drilling Edition - The Basics of Drilling

■ Runout Accuracy

For the runout accuracy of web-thinned drills, the runout after thinning (A) is important in addition to the difference in lip height (B).



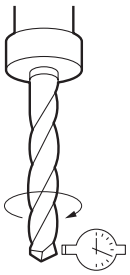
(A): Runout accuracy of thinning point
(B): The difference of the lip height



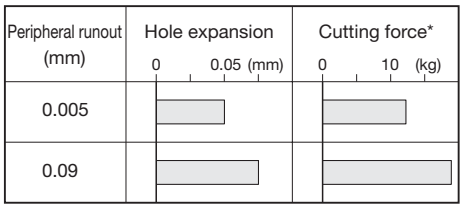
■ Drill Mounting Peripheral Runout Accuracy

● When the tool rotates

The peripheral runout accuracy of the drill mounted on the spindle should be controlled within 0.03mm. If the runout exceeds the limit, the drilled hole will become large with an increase in lateral cutting force, which may result in drill breakage.



Runout: Within 0.03mm

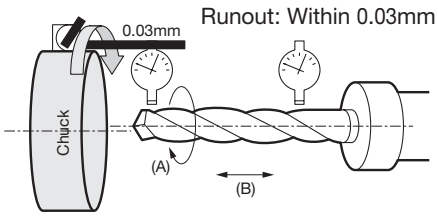


* Horizontal cutting force.
Drill: MDS120MK, work material: S50C (230HB)
Cutting Conditions: v_c=50m/min, f = 0. 3mm/rev, H = 38mm
Water-soluble Coolant

● When the work material rotates

The peripheral runout at the drill edge (A) and the concentricity at (B) should be controlled within 0.03mm.

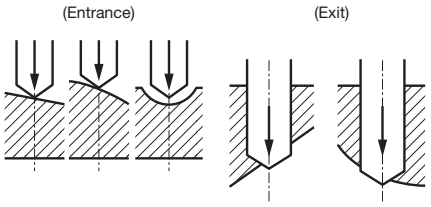
Runout: Within 0.03mm



■ Work Material Surface and Drill Performance

● Work material with slanted or uneven surface

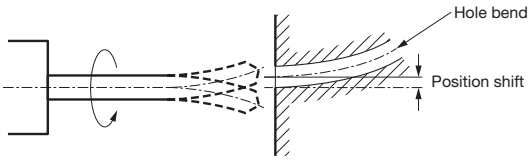
If the surface of the hole entrance or exit is slanted or uneven, decrease the feed rate to 1/3 to 1/2 of the recommended cutting conditions.



■ How to Use a Long Drill

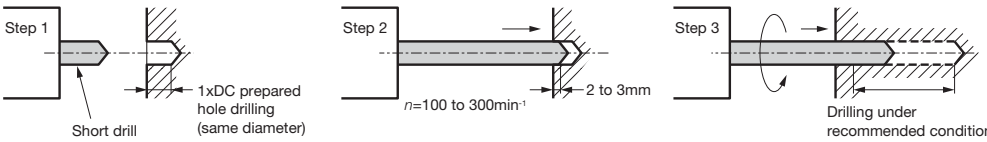
● Problem

When using a long drill (e.g. XHGS type), SMDH-D type drill or SMDH-12D type drill at high rotation speeds, the runout of the drill tip may cause a deviation at the entry point as shown on the right, bending the drill hole and resulting in drill breakage.



● Remedies

Method 1



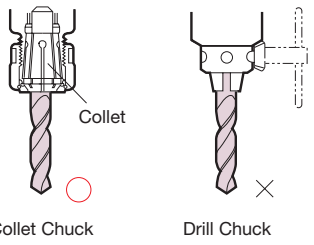
Method 2 *Low rotation speed minimises centrifugal forces and prevents the drill from bending.

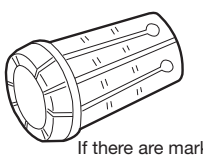
Drilling Edition - MULTIDRILL Usage Guidance Drilling Edition

■ Drill Retention

(1) Collet Selection and Maintenance

- Ensure proper chucking of drills to prevent vibration. Collet type chucks are recommended, as the grip is strong and can be used with ease.
  (Drill chucks and keyless chucks are not suitable for MULTIDRILL as they have a weaker grip force.)
- When replacing drills, regularly remove cutting chips inside the collet by cleaning the collet and the spindle with oil. Repair marks with an oilstone.

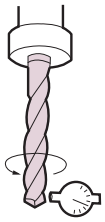




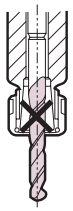
If there are marks, repair with an oilstone or change to a new one.

(2) Drill Mounting

- The peripheral runout of the drill mounted on the spindle must be within 0.03mm.
- Do not chuck on the drill flute.
  (If the drill flute is inside the holder, chip evacuation will be obstructed, causing damage to the drill.)



Peripheral runout within 0.03mm.



Do not grip on the drill flute.

■ Using Cutting Oil

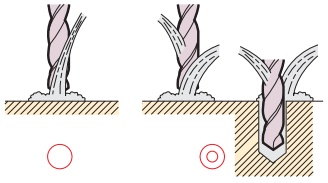
(1) Choosing Cutting Oil

- If the cutting speed is more than 40m/min, cutting oil (JISW1 type 2) is recommended as its cooling effects and chip control capacity are good, and it is highly soluble.
- For optimum tool life at cutting speeds of less than 40m/min, sulfo-chlorinated oil (JISA1 type 1) is recommended as it has a lubricating effect and is non-water soluble. * Insoluble cutting oil may be flammable. To prevent fire, a substantial amount of oil should be used to cool the component so that smoke and heat will not be generated.

(2) Supply of Coolant

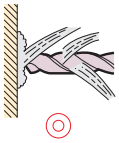
- External Coolant Supply
  There must be a sufficient external supply of coolant at the hole position.
  Coolant pressure 0.3 to 0.5MPa, coolant volume 3 to 10 ℓ/min is a guideline.
- Internal Coolant Supply
  For holes ø4 or smaller, the oil pressure must be at least 1.5MPa to ensure a sufficient supply of coolant. For ø6 and above, if L/D is < 3, the pressures should be at 0.5 to 1.0MPa. If L/D is > 3, a hydraulic pressure of at least 1 to 2MPa is recommended.

- External Coolant Supply
- Vertical drilling



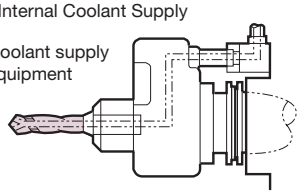
Use high pressure at entrance　　Easy to use

- Horizontal drilling

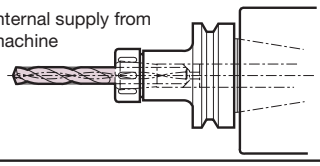


Use high pressure at entrance

- Internal Coolant Supply
- Coolant supply equipment



- Internal supply from machine

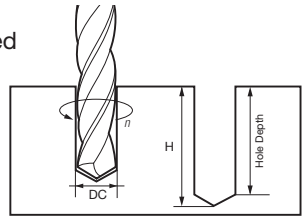


■ Calculation of Power Consumption and Thrust

- Calculating cutting speed

$$v_c = \frac{\pi \times DC \times n}{1{,}000}$$

$$n = \frac{1{,}000 \times v_c}{\pi \times DC}$$



- Calculating feed rate per revolution and per tooth

$$v_f = n \times f \qquad f = \frac{v_f}{n}$$

- Calculating cutting time

$$T = \frac{H}{v_f}$$

v_c : cutting speed (m/min)
π : ≈ 3.14
DC : Drill diameter (mm)
n : Rotation speed (min^{-1})
v_f : Feed rate (mm/min)
f : Feed rate per revolution (mm/rev)
H : Drilling depth (mm)
T : Cutting time (min)
HB : Work material Brinell hardness

- Calculating power consumption and thrust <Experimental>

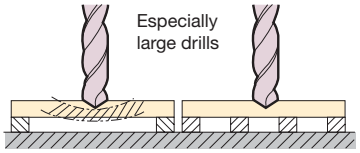
Power consumption (kW) = $HB \times DC^{0.68} \times v_c^{1.27} \times f^{0.59} / 36{,}000$

Thrust (N) = $0.24 \times HB \times DC^{0.95} \times f^{0.61} \times 9.8$

* When designing the machine, an allowance of 1.6 x power consumption and 1.4 x thrust should be given.

■ Clamping of the Workpiece

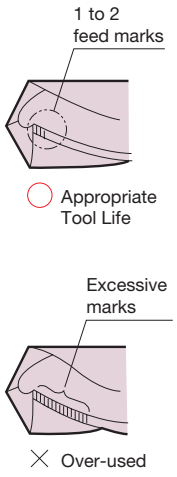
High thrust forces occur during high-efficiency drilling. Therefore, the workpiece must be supported to prevent fractures caused by deformation. Large torques and horizontal cutting forces also occur. Therefore, the workpiece must be clamped firmly enough to withstand them.



■ Drill Regrinding

- When to regrind
  When one or two feed marks (lines) appear on the margin, when corner wear reaches the margin width or when small chipping occurs, it indicates that the drill needs to be sent for regrinding.
  Regrind promptly.
- How and where to regrind
  We recommend regrinding and recoating.
  Regrinding alone is fine, but if the work material is steel, recoating is recommended to prevent shortening of tool life. Note: Ask us or an approved vendor to recoat with our proprietary coating.
- Regrinding on your own
  Customers regrinding their own drills can obtain MULTIDRILL Regrinding Instructions from us directly or their vendor.

- Tool life determinant



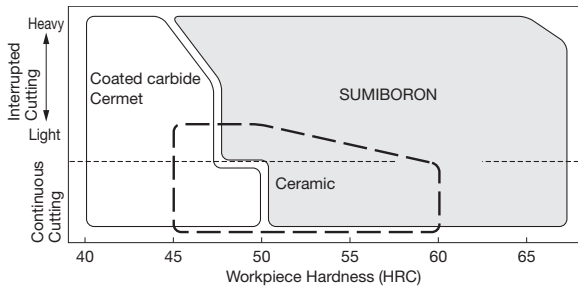
Drilling Edition - Troubleshooting for Drilling

■ Troubleshooting for Drilling

Failure		Cause	Basic Remedies	Countermeasure Examples
Drill Failure	Excessive Wear on Rake Face	· Inappropriate cutting conditions	· Use higher cutting speeds	· Refer to the upper limit of the recommended cutting conditions listed in this catalogue
			· Increase feed rate	· Refer to the upper limit of the recommended cutting conditions listed in this catalogue
		· Unsuitable coolant	· Reduce pressure if using internal coolant	· 1.5MPa or less (external coolant supply can be used at hole depths (L/D) of 2 or less)
			· Use coolant with more lubricity	· Use JIS A1 grade No. 1 or its equivalent
	Chisel Point Breakage	· Off-centre starts	· Reduce feed rate at entry point	· f=0.08 to 0.12mm/rev
			· Pre-machining of flat surface for entry	· Drill flat base with Flat MULTIDRILL
		· Equipment, work materials, etc. lack rigidity	· Change cutting conditions to reduce resistance	· Increase v_c to decrease f (reduce thrust)
			· Improve clamp strength of work material	
		· Cutting edge is too weak	· Increase size of chisel width	· Use a chisel with a width of 0.1 to 0.2mm
			· Increase amount of honing on cutting edge	· Increase the width of the thinning area at the centre by 1.5 times
	Breakage on Peripheral Cutting Edge	· Inappropriate cutting conditions	· Decrease the cutting speed	· Refer to the lower limit of the recommended cutting conditions listed in this catalogue
			· Reduce feed rate	· Refer to the lower limit of the recommended cutting conditions listed in this catalogue
		· Unsuitable coolant	· Use coolant with more lubricity	· Use JIS A1 grade No. 1 or its equivalent
		· Equipment, work materials, etc. lack rigidity	· Improve clamp strength of work material	
		· Cutting edge is too weak	· Increase amount of honing on cutting edge	· Increase the width of the outer cutting edge by 1.5 times
			· Reduce the front relief angle	· Reduce the front relief angle by 2 to 3°
		· Entry from peripheral cutting edge	· Increase margin width (W margin specification)	· Increase the margin width by 2 to 3 times
		· Interruption during drill engagement	· Reduce feed rate	· Refer to the lower limit of the recommended cutting conditions listed in this catalogue
			· Increase amount of honing on cutting edge	· Increase the width of the outer cutting edge by 1.5 times
			· Reduce the front relief angle	· Reduce the front relief angle by 2 to 3°
	Margin Wear	· Inappropriate cutting conditions	· Decrease the cutting speed	· Refer to the lower limit of the recommended cutting conditions listed in this catalogue
		· Unsuitable coolant	· Use coolant with more lubricity	· Use JIS A1 grade No. 1 or its equivalent
			· Use more coolant	· If using external coolant, switch to internal coolant
		· Remaining margin wear	· Schedule for earlier regrind and ensure back taper	· If margin damage occurs, regrind to 1mm or less
		· Improper tool design	· Increase amount of back taper	· Make back taper 0.5/100
			· Reduce margin width	· Reduce the margin width to around 2/3
	Drill Breakage	· Chip blockage	· Use the optimal cutting conditions and tools	· Refer to recommended cutting conditions listed in this catalogue
			· Use more coolant	· If using external coolant, switch to internal coolant
		· Collet clamp too weak	· Use a collet with strong grip force	· If the collet chuck is damaged, replace it · Change the collet holder to the next size up
		· Equipment, work materials, etc. lack rigidity	· Improve clamp strength of work material	
Unsatisfactory Hole Accuracy	Oversized Holes	· Off-centre starts	· Reduce feed rate at entry point	· f=0.08 to 0.12mm/rev
			· Decrease the cutting speed	· Refer to the lower limit of the recommended cutting conditions listed in this catalogue
			· Pre-machining of flat surface for entry	· Flat machining with endmill
		· Drill lacks rigidity	· Use the optimal drill type for the hole depth	· Refer to this catalogue
			· Improve overall drill rigidity	· Large web, small groove width
		· Drill has runout	· Improve drill mounting precision	· If the collet chuck is damaged, replace it
			· Improve drill retention rigidity	· Change the collet holder to the next size up
		· Equipment, work materials, etc. lack rigidity	· Improve clamp strength of work material	
	Poor Surface Roughness	· Inappropriate cutting conditions	· Increase cutting speed	· Refer to the upper limit of the recommended cutting conditions listed in this catalogue
			· Reduce feed rate	· Refer to the lower limit of the recommended cutting conditions listed in this catalogue
		· Unsuitable coolant	· Use coolant with more lubricity	· Use JIS A1 grade No. 1 or its equivalent
	Holes Not Straight	· Off-centre starts	· Increase feed rate	· Refer to the upper limit of the recommended cutting conditions listed in this catalogue
		· Drill is not mounted properly	· Improve drill mounting precision	· If the collet chuck is damaged, replace it
			· Improve drill retention rigidity	· Change the collet holder to the next size up
		· Equipment, work materials, etc. lack rigidity	· Improve clamp strength of work material	
			· Select a double margin tool	· Refer to this catalogue
Unsatisfactory Chip Control	Chips Clog	· Inappropriate cutting conditions	· Increase cutting speeds	· Refer to the upper limit of the recommended cutting conditions listed in this catalogue
			· Increase feed rate	· Refer to the upper limit of the recommended cutting conditions listed in this catalogue
		· Poor chip evacuation	· Increase volume if using internal coolant	
	Long Stringy Chips	· Inappropriate cutting conditions	· Increase feed rate	· Refer to the upper limit of the recommended cutting conditions listed in this catalogue
			· Increase cutting speeds	· Refer to the upper limit of the recommended cutting conditions listed in this catalogue
		· Strong cooling effect	· Reduce pressure if using internal coolant	· The pressure should be 1.5 MPa or less if using internal coolant
		· Dull cutting edge	· Reduce amount of edge honing	· Reduce the width to around 2/3

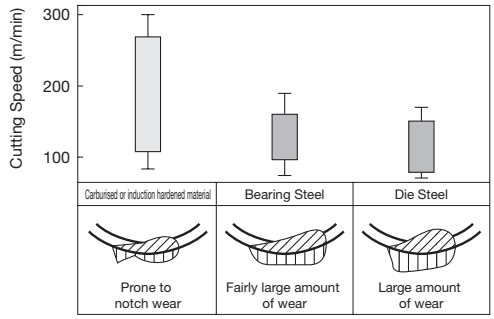
Hardened Steel Machining with SUMIBORON

■ Recommended zones for SUMIBORON by workpiece hardness and shape



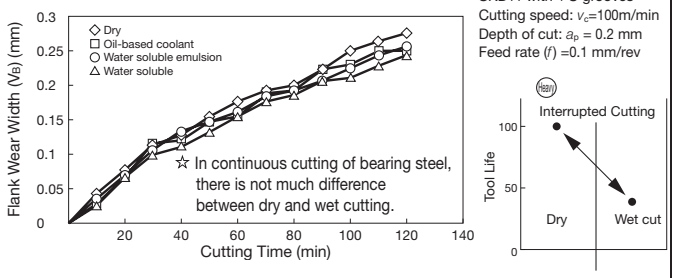
* While 50HRC is the limit for conventional coated carbide, coated carbide AC503U enables machining up to 62HRC (low-speed/continuous)

■ Cutting speed recommendations for each work material



■ Influence of coolant on tool life

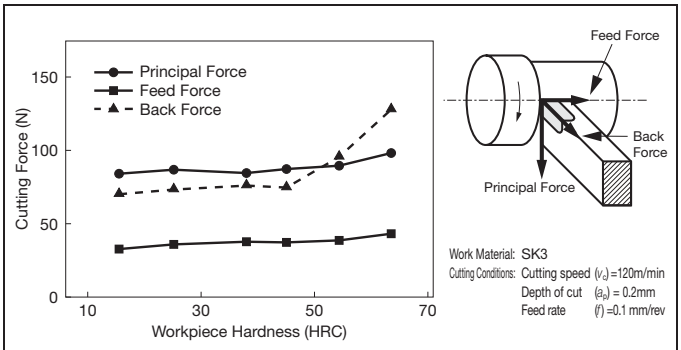
● Continuous Cutting ● Interrupted Cutting



Work material: SUJ2(58 to 62 HRC)
Cutting conditions: TPGN160304
v_c=100m/min, a_p=0. 15mm, f=0. 1mm/rev
Continuous Cutting

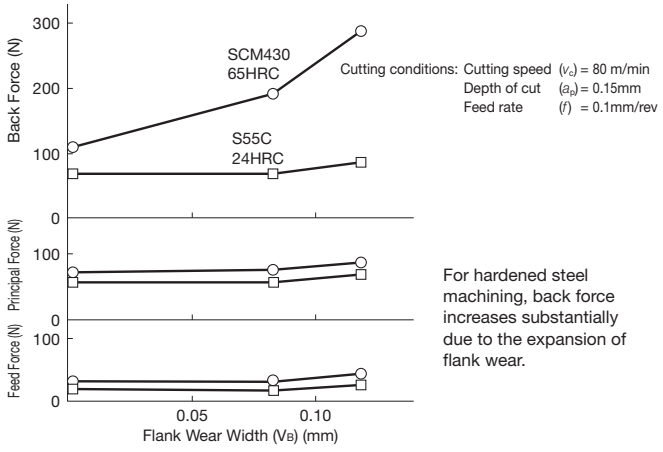
For continuous cutting, the influence of coolant on tool life is minimal.
For interrupted cutting, the thermal impact shortens the tool life in wet conditions.

■ Relation between work material hardness and cutting force



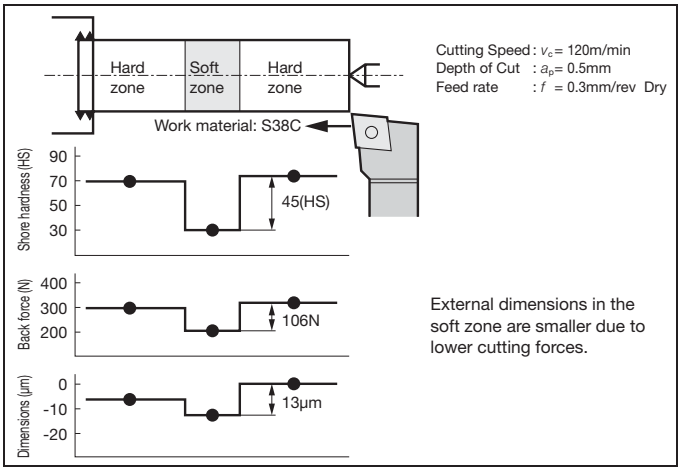
Back force increases substantially for harder workpieces.

■ Relation between flank wear and cutting force



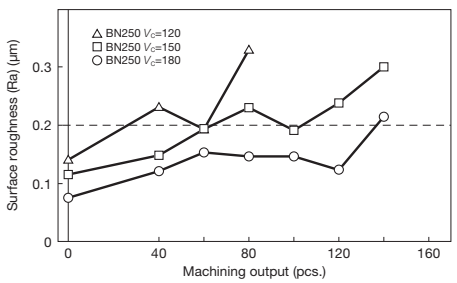
For hardened steel machining, back force increases substantially due to the expansion of flank wear.

■ Influence of work material hardness on cutting force and accuracy



External dimensions in the soft zone are smaller due to lower cutting forces.

■ Relation between cutting speed and surface roughness

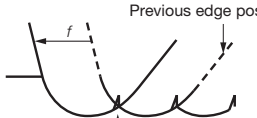
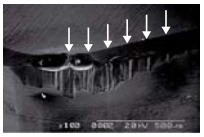


Work material: SCM420H
58 to 62HRC
Holder: MTXNR2525
Tool: NU-TNMA160408

Cutting Conditions:
v_c=120,150,180m/min
f = 0.045mm/rev
a_p= 0.15mm
Wet

At high cutting speeds, surface roughness is more stable.

■ Improvement of surface roughness by altering the feed rate

Constant Feed Rate	Variable Feed Rate
	
Stationary Notch Location	Shifting Notch Location
	

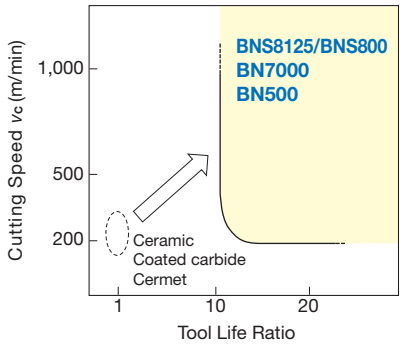
☆ Varying the feed rate spreads the notch location over a larger area.
→Surface finish improves and notch wear decreases.

High Speed Machining of Cast Iron with SUMIBORON

■ Advantages of using SUMIBORON for cast iron machining

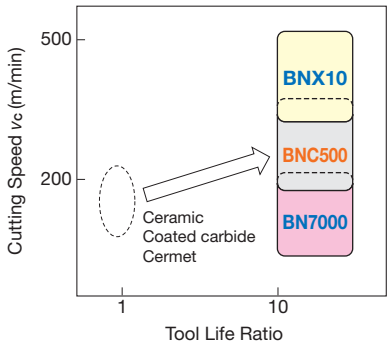
High-speed Machining

● Gray Cast Iron

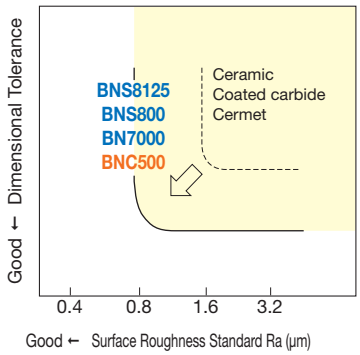


High-speed Machining

● Ductile Cast Iron

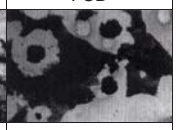
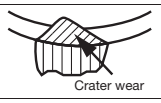
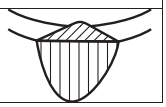


High-precision Machining

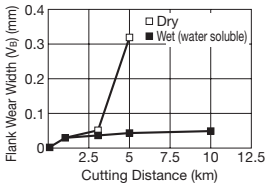


■ Turning

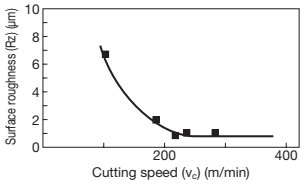
● Cast iron structure and wear shape examples

		FC	FCD
Structure			
	Matrix	Pearlite	Pearlite + Ferrite
Tool wear shape	Wet		
	Dry	 Crater wear	

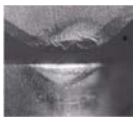
(v_c=200 to 500m/min)



Work material : Continuous cutting with FC250
Tool material : BN500
Tool Shape : SNGN120408
Cutting Conditions : v_c =450m/min
a_p=0.25mm
f =0.15 mm/rev
Dry & Wet (water soluble)



WET (Water soluble)



DRY

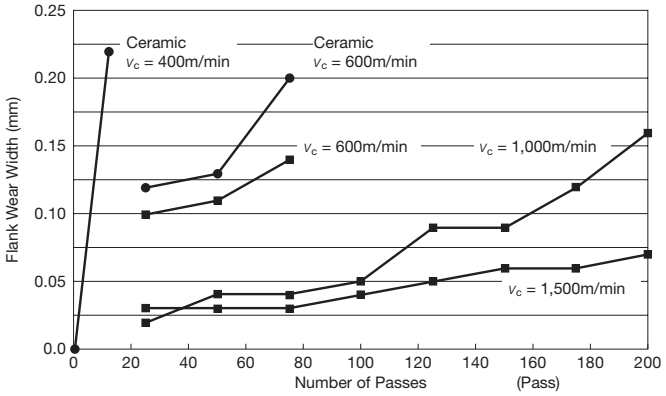
Machine : N/C lathe
Work Material : FC250 200HB
Holder : MTJNP2525
Tool Grade : BN500
Tool Shape : TNMA160408
Cutting Conditions : v_c=110 to 280m/min
f =0.1 mm/rev
a_p=0.1mm
Wet

For turning cast iron with SUMIBORON, cutting speeds (v_c) should be 200m/min and above. Wet cutting is recommended.

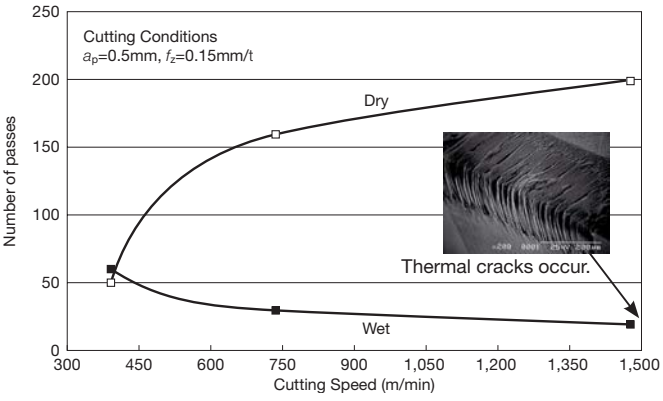
■ Milling

BN Finish Mill EASY (for high-speed finishing of cast iron)

- Enables cutting with v_c of 2,000m/min
- Surface finish roughness 3.2Rz (1.0Ra)
- Economical insert reduces running costs.
- Unit style enables easy runout adjustment.
- Employs safe, anti-centrifugal-force construction for high-speed conditions.



· Work material: Gray cast iron (FC250)
· Cutting conditions: a_p =0.5mm, f_z =0.1mm/t Dry
· Tool grade: BN7000



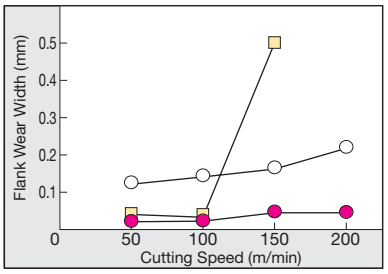
Dry cutting is recommended for high speed milling of cast iron with SUMIBORON.

Machining Exotic Alloys with SUMIBORON

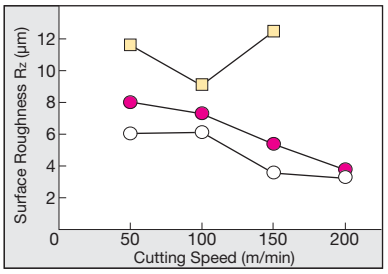
■ Sintered Alloy

SUMIBORON — Cemented Carbide — Cermet

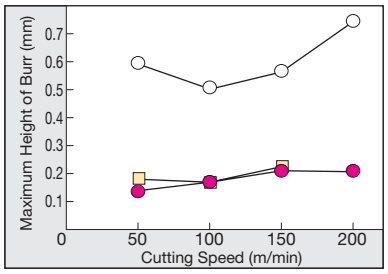
1. Flank wear



2. Surface roughness



3. Height of burr



Work material: Equivalent to SMF4040, ø80-ø100mm heavy interrupted facing with grooves and drilled holes. (After 40 passes)
Cutting conditions: f=0.1mm/rev, a_p=0.1mm Wet
Tool Cat. No.: TNGA160404

Cemented carbide and cermet can perform at v_c up to 100m/min. However, if v_c is around 120m/min or higher, wear occurs rapidly, resulting in poorer surface roughness and greater spread of burrs. On the other hand, SUMIBORON exhibits stability and superior wear resistance, burr prevention and surface roughness, especially at high speeds.

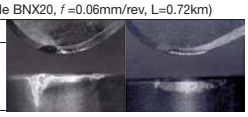
■ Heat-Resistant Alloy

● Nickel based alloy

Typical tool damage of CBN tool when cutting Inconel 718

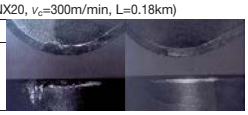
★ Influence of cutting speed (Tool grade BNX20, f =0.06mm/rev, L=0.72km)

v_c =300m/min	v_c =500m/min
Notch Wear, Flank Wear	Flank Wear



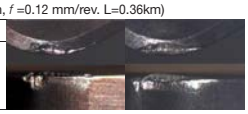
★ Influence of feed rate (Tool grade BNX20, v_c=300m/min, L=0.18km)

f =0.12 mm/rev	f =0.06 mm/rev
Notch Wear	Flank Wear



★ Influence of tool grade (v_c=500m/min, f =0.12 mm/rev. L=0.36km)

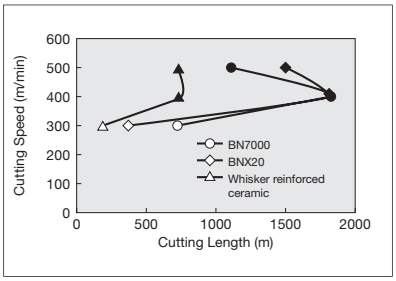
BNX20	BN7000
Notch Wear	Flank Wear



Cutting Conditions: a_p= 0.3mm Wet

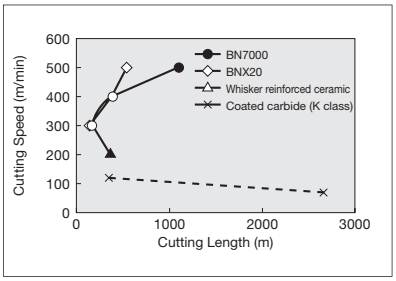
0.5mm

Cutting conditions: f = 0.06mm/rev, a_p= 0.3mm Wet



Tool life criteria
Notch wear = 0.25mm (○)
or flank wear = 0.25mm
BNX20 is recommended for high speed and low feed rates; BN7000 is recommended for cutting speeds below v_c=240m/min.

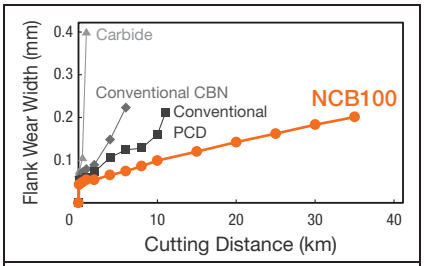
Cutting conditions: f = 0.12mm/rev, a_p= 0.3mm Wet



Tool life criteria
Notch wear = 0.25mm (○)
or flank wear = 0.25mm
BN7000 is recommended for cutting at high feed rates (over f=0.1mm/rev).

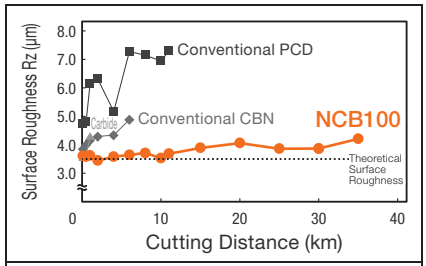
■ Cutting Performance (Machining Titanium Alloy)

● Wear Resistance

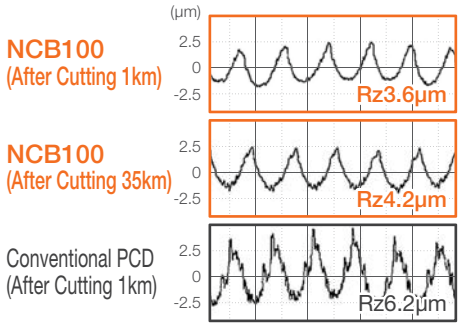


Work Material: Titanium Alloy (Ti-6Al-4V)
Tool Used: CNGA120408
Cutting Conditions: v_c = 150m/min, f = 0.15mm/rev, a_p = 0.5mm
Wet (High Pressure Coolant)

● Machined Surface Roughness



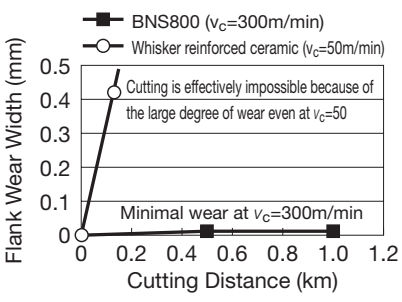
Work Material: Titanium Alloy (Ti-6Al-4V)
Tool Used: CNGA120408
Cutting Conditions: v_c = 150m/min, f = 0.15mm/rev, a_p = 0.5mm
Wet (High Pressure Coolant)

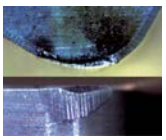


■ Hard Facing Alloys

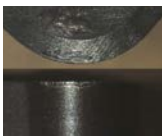
Work Material: Colmonoy No.6
(NiCr-based self-fluxing alloy)

Tool Cat. No. : SNGN090308
Cutting conditions : v_c=50,300m/min
f =0.1 mm/rev
a_p= 0.2mm
Dry





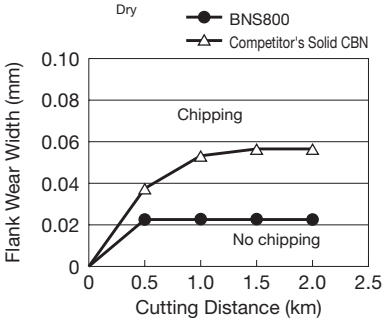
Whisker reinforced ceramic
(v_c =50m/min, after 0.1km of cutting)

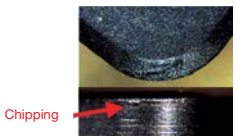


BNS800
(v_c =300m/min, after 1km of cutting)

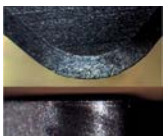
Work Material: Stellite SF-20
(Co-based self-fluxing alloy)

Tool Cat. No. : SNGN090308
Cutting conditions : v_c=50m/min
f =0.1 mm/rev
a_p= 0.2mm
Dry



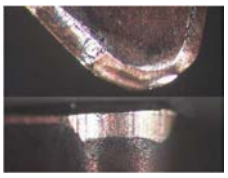
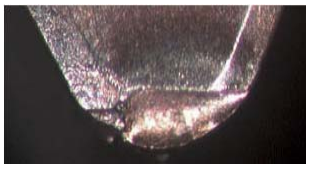
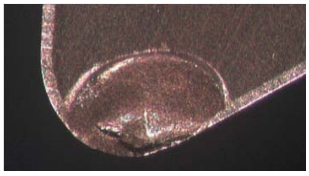
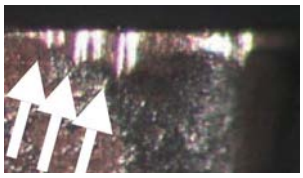
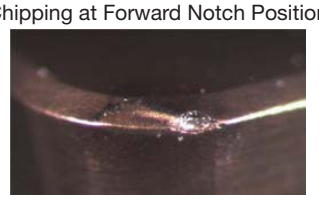
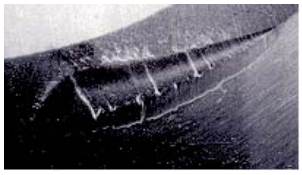


Competitor's Solid CBN
(After 2km of cutting)



BNS800
(After 2km of cutting)

Cutting Edge Failure and Countermeasures when Machining Hardened Steel

Insert Failure	Cause	Countermeasures
Flank Wear 	· Grade lacks wear resistance	· Select a more wear-resistant grade (e.g. BNC2115, BNC2010,BN1000 or BN2000)
	· Cutting speed is too fast	· Reduce the cutting speed to v_c=200m/min or less (higher feed rate also reduces tool-to-work contact time)
		· Use an insert with a larger relief angle
Crater Wear 	· Grade lacks crater wear resistance	· Select a higher-efficiency grade (e.g. BNC2115, BNC2010, BNX25 or BNX20)
Breakage at Bottom of Crater	· Cutting speed is too fast	· Reduce the cutting speed to v_c=200m/min or less and increase the feed rate (low speed, high feed) (higher feed rate alone also reduces tool-to-work contact time)
Flaking 	· Grade lacks toughness	· Select a tougher grade (e.g. BNC2125, BNC2020 or BN2000)
	· Back force is too high	· Select an insert with a stronger cutting edge (increase negative land angle and perform honing)
		· If the grade is tough enough, improve the cutting edge sharpness
Notch Wear 	· High stress at boundary	· Change to a grade with a higher notch wear resistance (e.g. BNC2115, BNC2010 or BN2000)
		· Increase cutting speed (150 m/min or more)
		· Change to the Variable Feed Rate method, which alters the feed rate in fixed output intervals
		· Increase negative land angle and perform honing
Chipping at Forward Notch Position 	· Impact to front cutting edge is too large or occurs constantly	· Change to a micro-grained grade with a higher fracture resistance (e.g. BNC300 and BN350)
		· Increase the feed rate (higher feed rates are recommended to reduce chipping)
		· Select an insert with a stronger cutting edge (increase negative land angle and perform honing)
Chipping at Side Notch Position	· Impact to side cutting edge is too large or occurs constantly	· Change to a grade with a higher fracture resistance (e.g. BN350 or BNC300)
		· Reduce feed rate
		· Use an insert with a larger side cutting angle
		· Use an insert with a larger corner radius
		· Select an insert with a stronger cutting edge (increase negative land angle and perform honing)
Thermal Crack 	· Thermal shock is too severe	· Completely dry conditions are recommended
		· Select a grade with better thermal conductivity
		· Reduce cutting speed, feed rate, and depth of cut to decrease the machining load

Reference: SI Unit Conversion List

■ Basic SI units

● Quantity as a reference of SI

Quantity	Material	Symbol
Length	Metre	m
Mass	Kilogram	kg
Time	Second	s
Current	Ampere	A
Temperature	Kelvin	K
Quantity of substance	Mol	mol
Luminous intensity	Candela	cd

● Basic unit provided with unique name and symbol (extracted)

Quantity	Material	Symbol
Frequency	Hertz	Hz
Force	Newton	N
Pressure and stress	Pascal	Pa
Energy, work, and heat quantity	Joule	J
Power and efficiency	Watt	W
Voltage	Bolt	V
Electrical resistance	Ohm	Ω

■ SI prefixes

● Prefix showing integral powers of 10 combined with SI units

Coefficient	Material	Symbol	Coefficient	Material	Symbol	Coefficient	Material	Symbol
10^{24}	Yotta	Y	10^{3}	Kilo	k	10^{-9}	Nano	n
10^{21}	Zeta	Z	10^{2}	Hecto	h	10^{-12}	Pico	p
10^{18}	Exa	E	10^{1}	Deca	da	10^{-15}	Femto	f
10^{15}	Peta	P	10^{-1}	Deci	d	10^{-18}	Atto	a
10^{12}	Tera	T	10^{-2}	Centi	c	10^{-21}	Zepto	z
10^{9}	Giga	G	10^{-3}	Milli	m	10^{-24}	Yocto	y
10^{6}	Mega	M	10^{-6}	Micro	μ			

■ Principal SI unit conversion list (☐ portions are SI units)

● Force

N	kgf
1	1.01972×10^{-1}
9.80665	1

● Stress

Pa(N/m^2)	MPa(N/mm^2)	kgf/mm^2	kgf/cm^2	kgf/m^2
1	1×10^{-6}	1.01972×10^{-7}	1.01972×10^{-5}	1.01972×10^{-1}
1×10^{6}	1	1.01972×10^{-1}	1.01972×10	1.01972×10^{5}
9.80665×10^{6}	9.80665	1	1×10^{2}	1×10^{6}
9.80665×10^{4}	9.80665×10^{-2}	1×10^{-2}	1	1×10^{4}
9.80665	9.80665×10^{-6}	1×10^{-6}	1×10^{-4}	1

● Pressure

1Pa = 1N/m^2, 1MPa = 1N/mm^2

Pa(N/m^2)	kPa	MPa	GPa	bar	kgf/cm^2	mmHg or Torr
1	1×10^{-3}	1×10^{-6}	1×10^{-9}	1×10^{-5}	1.01972×10^{-5}	7.50062×10^{-3}
1×10^{3}	1	1×10^{-3}	1×10^{-6}	1×10^{-2}	1.01972×10^{-2}	7.50062
1×10^{6}	1×10^{3}	1	1×10^{-3}	1×10	1.01972×10	7.50062×10^{3}
1×10^{9}	1×10^{6}	1×10^{3}	1	1×10^{4}	1.01972×10^{4}	7.50062×10^{6}
1×10^{5}	1×10^{2}	1×10^{-1}	1×10^{-4}	1	1.01972	7.50062×10^{2}
9.80665×10^{4}	9.80665×10	9.80665×10^{-2}	9.80665×10^{-5}	9.80665×10^{-1}	1	7.35559×10^{2}
1.33322×10^{2}	1.33322×10^{-1}	1.33322×10^{-4}	1.33322×10^{-7}	1.33322×10^{-3}	1.35951×10^{-3}	1

● Work/Energy/Heat quantity

1Pa = 1N/m^2

J	kW·h	kgf·m	kcal
1	2.77778×10^{-7}	1.01972×10^{-1}	2.38889×10^{-4}
3.60000×10^{6}	1	3.67098×10^{5}	8.60000×10^{2}
9.80665	2.72407×10^{-6}	1	2.34270×10^{-3}
4.18605×10^{3}	1.16279×10^{-3}	4.26858×10^{2}	1

● Power (efficiency and motive energy) / Thermal flow

1J=1W/s,1J=1N/m

W	kgf·m/s	PS	kcal/h
1	1.01972×10^{-1}	1.35962×10^{-3}	8.60000×10^{-1}
1×10^{3}	1.01972×10^{2}	1.35962	8.60000×10^{2}
9.80665	1	1.33333×10^{-2}	8.43371
7.355×10^{2}	7.5×10	1	6.32529×10^{2}
1.16279	1.18572×10^{-1}	1.58095×10^{-3}	1

1W = 1J/s, PS: Horsepower

● Specific heat

J/(kg·K)	1kcal (kg/°C) cal/(g/°C)
1	2.38889×10^{-4}
4.18605×10^{3}	1

● Thermal conductivity

W/(m/K)	kcal/(h·m·°C)
1	8.60000×10^{-1}
1.16279	1

● Rotation speed

min^{-1}	rpm
1	1

1min^{-1}=1rpm

References

■ Metals Symbols Chart (Excerpt)

● Carbon Steel for Structural Use P

JIS	AISI/ASTM	DIN/EN	GB	BS	AFNOR	ГОСТ
S10C	1008 1010	C10E C10R 1.1122	08 10	040A10 045A10 045M10	XC10	08 10
S12C	1012	—	—	040A12	XC12	—
S15C	1015	C15E C15R 1.1132	15	055M15	—	15
S20C	1020	C22 CK22	20	070M20	—	20
S25C	1025	C25 C25E C25R C16D 1.0415	25	—	—	25
S30C	1030	C30 C30E C30R	30	080A30 080M30	—	30
S35C	1035	C35 C35E C35R 1.1172	35	080A35 080M36	—	35
S40C	1040 C40E	C40 C40E C40R 1.1186	40	060A40 080A40 080M40	—	40
S43C	1042 1043	—	—	080A42	XC42H1 XC42H2	40Г
S45C	1045 1045H	C45 C45E C45R 1.1191 1.1192	45	060A45 080M46	XC45	45
S50C	1049	C50 C50E C50R 1.1206	50	080M50	XC50	50
S53C	1050 1053	—	50Mn	080A52	XC54	—
S55C	1055	C55 C55E C55R 1.1203	55	070M55	XC55H1 XC55H2	55
S58C	1060	C60 C60E C60R	60	060A57 080A57	XC60	—
S60C	1059	C60E 1.1221	60 60Mn	—	—	60
S09CK	1010	C10E C10R	—	045A10 045M10	XC10	—
S15CK	1015	C15E C15R	—	—	XC12	—
S20CK	—	CK22	—	—	XC18	—

● Cr Steel P

SCr415	5115	17Cr3 1.7016	15Cr	—	—	15X
SCr420	5120	—	20Cr	—	20MC5	20X
SCr430	5130 5132	34Cr4 34CrS4 1.7033	30Cr	530A30 530A32	32C4	30X
SCr435	5135	37Cr4 1.7034	35Cr	530A36	38C4	35X
SCr440	5140	41Cr4 41CrS4 1.7035	40Cr	530M40 530A40	42C4	40X
SCr445	5147	—	45Cr	—	—	45X

● Nickel Chromium Steel P

SNC415	4720 4715	20NiCrMo2-2 10NiCr5-4 17CrNi6-6 1.5918 1.5805 1.6523	20CrNi 12CrNi2 15CrNi6K	—	—	20XH 12XH
SNC236	3140 4337	41crCrMo7-3-2 34CrNiMo6	40CrNi 34CrNi2	—	—	40XH
SNC246	8645	—	45CrNi	—	—	45XH
SNC815	E3310	15niCr13 1.5752	12CrNi3	—	—	12XH3A
SNC620	—	20NiCrMo13-4 1.6660	20CrNi3	—	—	20XH3A
SNC631	—	30NiCrMo16-6 1.6747	30CrNi3	—	—	30XH3A
SNC836	—	35NiCrMo16 1.6773	37CrNi3	—	—	—

● Ni-Cr-Mo Steel P

SNCM220	8615 8617 8620 8622 4718	20NiCrMo2-2 20NiCrMoS2-2 17NiCrMo6 1.6566 1.6523	20CrNiMo 18CrMnNiMo 20NiCrMoK	805A20 805M20 805A22 805M22	20NCD 2	20XH2M 18XHГM
SNCM240	8637 8640	39NiCrMo3 1.6510	40CrNiMo	—	—	40XH2MA
SNCM415	—	—	—	—	—	
SNCM420	4320	17NiCrMo6-4	20CrNi2Mo			20XH2M (20XHM)
SNCM439	4340	41NiCrMo7-3-2 1.6563	40CrNi2Mo	—	—	40XH2MA
SNCM447	4340	41NiCrMo7-3-2 1.6563	45CrNiMoV	—	—	—

● Cr-Mo Steel P

SCM415	—	18CrMo4 1.7243	15CrMo	—	—	15XM
SCM420	—	20MoCr4 1.7321	20CrMo	708M20	—	20XM

● Cr-Mo Steel (continued) P

JIS	AISI/ASTM	DIN/EN	GB	BS	AFNOR	ГОСТ
SCM421	4121	18CrMo4 22CrMoS35 1.7243	20CrMnMo	—	—	25ХГМ
SCM425	—	25CrMo 1.7218	25CrMo	—	—	—
SCM430	4130	—	30CrMo	708A30	30CD4	30XM
SCM435	4135 4137	34CrMo4 1.7220	35CrMo	708A37 709A37	34CD4 38CD4 35CD4	35XM
SCM440	4142 4140	42CrMo4 42CrMoS4 1.7225	42CrMo	708M40 708A40 708A42 709A42 709M40	42CD4	38XM
SCM445	4145 4150	50CrMo4 1.7228	50CrMo	708A47	—	—

● Manganese Chromium Steel/Manganese Steel P

SMn420	1522 1524	18Mn5 1.0436	20Mn2	150M19 120M19	20M5	20Г
SMn433	1330	28Mn6 1.1170	30Mn2	—	—	30Г2
SMn438	1335 1541	—	35Mn2	150M36	40M6	35Г2
SMn443	1340 1345 1541	—	40Mn2 45Mn2	135M40 150M36	35M5	35Г2 45Г2
SMnC420	5120	20MnCr5 1.7147	20CrMn	—	—	18ХГ
SMnC443	5140	41Cr4 1.7035	40CrMn	—	—	—

● Carbon Tool Steel P

SK140 SK1	W2-13A W1-13	—	T13	—	$Y_2$140	—
SK120 SK2	W1-11 1/2	C120U 1.1555	T12	BW1C	$Y_2$120	y12
SK105 SK3	W1-10 W1-10 1/2	C105U 1.1545 C105W1	T11	BW1B	$Y_1$105	—
SK95 SK4	W1-9 W1-9 1/2	C105U 1.1545	T10	BW1A	$Y_1$90 $Y_1$80	y10
SK85 SK5	W1-8C W1-8	C80W1	T8Mn	BW1A	—	y8Г
SK80	W1-8A	C80U 1.1525	T8	—	—	y8
SK70	1070	C70U 1.1520	T7	—	—	y7

● High Speed Steel P

SKH2	T1	HS18-0-1 1.3355	W18Cr4V	BT1	Z80WCV 18-04-01	P18
SKH3	T4	S18-1-2-5	—	BT4	Z80WKCV 18-05-04-01	—
SKH4	T5	—	—	BT5	Z80WKCV 18-10-04-02	—
SKH10	T15	S12-1-4-5	W12Cr4V5Co5	BT15	Z160WKCV 12-05-05-04	P12K5V5
SKH51	M2	S6-5-2 1.3339	W6Mo5Cr4V2	BM2	Z160WDCV 06-05-04-02	P6M5ø2
SKH52	M3-1	HS6-6-2 1.3350	W6Mo6Cr4V2	—	—	—
SKH53	M3-2	S6-5-3 HS6-5-3 1.3344	W6Mo5Cr4V3	—	Z160WDCV 06-05-04-03	P6M5ø3
SKH54	M4	—	W6Mo5Cr4V4	BM4	Z130WDCV 06-05-04-04	—
SKH55	M35 M41	S6-5-2-5 HS6-5-2-5 1.3243	W6Mo5Cr4V2Co5	BM35	Z190WDCV 06-05-05-04-02	P6M5K5
SKH56	M36	—	—	—	—	—
SKH57	M48	HS10-4-3-10 1.3207	W10Mo4Cr4V3Co10	—	Z130WKCDV 10-10-04-04-03	—
SKH58	M7	HS2-8-2 1.3348	W2Mo9Cr4V2	—	Z100DCWV 09-04-02-02	—
SKH59	M42	HS2-10-1-8 1.3247	W2Mo9Cr4VCo8	BM42	Z130DKCWV 09-08-04-02-01	P2M9K8ø

● Alloy Tool Steel P

SKS11	F2	—	—	—	—	—
SKS2	—	105WCr6	—	—	105WC13	—
SKS51	L6	—	—	—	—	—
SKS41	—	—	4CrW2Si	—	—	4XB2C
SKS43	W2-9 1/2	—	—	BW2	$Y_1$105V	—
SKS44	W2-8 1/2	—	—	—	—	—
SKS3	O1	95MnWCr5 1.2825	9CrWMn	—	—	9XBГ
SKS31	O7	105WCr6	CrWMn	—	105WC31	XBГ
SKD1	D3	X210Cr12 1.2080	Cr12	BD3	X200Cr12	X12
SKD4	—	—	30W4Cr2V	BH21	Z32WCV5	—
SKD5	H21	X30WCrV9-3 1.2581	3Cr2W8V	BH21	Z30WCV9	3X2B8ø
SKD6	H11	X37CrMoV5-1 1.2343	4Cr5MoSiV	BH11	X38CrMoV5	4X5MøC
SKD61	H13	X40CrMoV5-1 1.2344	4Cr5MoSiV1	BH13	Z40CDV5	4X5Mø1C
SKD7	H10	X32CrMoV33 1.2365	3Cr3Mo3V	BH10	32DCV28	—
SKD8	H19	38CrCoWV18-17-17 1.2661	3Cr3Mo3VCo3	BH19	—	—
SKD10	D2	X153CrMoV12 1.2379	Cr12Mo1V1	—	—	X12M1ø1

References

● Alloy Tool Steel (continued) P

JIS	AISI/ASTM	DIN/EN	GB	BS	AFNOR	ГОСТ
SKD11	D2 D4	—	Cr12MoV	BD2	X160CrMoV12	X12Mø
SKD12	A2	X100CrMoV5 1.2363	Cr5Mo1V	BA2	Z100CDV5	—

● Ferritic Stainless Steels M

SUS405	405 S40500	X10CrAl13 1.4002	0Cr13Al 06Cr13Al	405S17	26CA13	—
SUS429	429 S42900	—	1Cr15 10Cr15 022Cr15NbTi	—	—	—
SUS430	430 S43000	X6Cr17 1.4016	1Cr17 10Cr15 S11710	430S17	Z8C17	12X17
SUS430F	430F S43020	X12CrMoS17	Y1Cr17 Y10Cr17	—	210CF17	—
SUS434	434 S43400	X6CrMo17-1 1.4113	1Cr17Mo 10Cr17Mo	434S17	Z8CD17.01	—

● Martensitic Stainless Steels M

SUS410	410 S41010	X10Cr13 1.4006	12Cr13 1Cr13	410S21	Z13C13	12X13
SUS403	403 S40300	—	12Cr12 1Cr12	—	—	—
SUS444	444 S44400	X2CrMoTi18-2 1.4521	019Cr19Mo2NbTi 00Cr18Mo2	—	—	—
SUS416	416 S41600	X12CrS13 1.4005	Y12Cr13 Y1Cr13	416S21	Z12CF13	—
SUS420J1	420 S42000	X20Cr13 1.4021	20Cr13 2Cr13	420S29	Z20C13	20X13
SUS420J2	420 S42000	X30Cr13 1.4028	30Cr13 3Cr13	420S45	Z30C13	30X13
SUS420F	420G S42020	X29Cr13 1.4029	Y30Cr13 Y3Cr13	—	Z30CF13	—
SUS431	431 S43100	X17CrNi16-2	17Cr16Ni2	431S29	—	—
SUS440C	440C S44004	—	108Cr17 11Cr17	—	Z100CD17	—

● Stainless Steel (Precipitation Hardened Structure) M

SUS630	630 S17400	X5CrNiCuNb16-4 1.4542	0Cr17Ni4Cu4Nb 05Cr17Ni4Cu4Nb	—	Z6CNU17.04	—
SUS631	631 S17700	X7CrNiAl17-7 1.4568	0Cr17Ni7Al 07Cr17Ni7Al	—	Z8CNA17.07	09X17H7 Ю

● Austenitic Stainless Steels M

SUS201	201 S20100	X12crMnNiN17-7-5 1.4372	1Cr17Mn6Ni5N 12Cr17Mn6Ni5N	—	Z12CMN17-07Az	—
SUS202	202 S20200	X12CrMnNiN18-9-5 1.4373	1Cr18Mn9Ni5N 12Cr18Mn9Ni5N	284S16	—	—
SUS301	301 S30100	X12CrNi17 7 1.4319 1.4310	1Cr17Ni7 12Cr17Ni7	—	Z12CN17.07	17X18H9
SUS302	302 S30200	X9CrNi18-9 1.4325	1Cr18Ni9 12Cr18Ni9	302S25	Z10CN18.09	12X18H9
SUS302B	302B S30215	—	1Cr18Ni9Si3 12Cr18Ni9Si3	—	—	—
SUS303	303 S30300	X8CrNiS18-9 X10CrNiS189 1.4305	Y1Cr18Ni9 Y12Cr18Ni9	303S21	Z10CNF18.09	—
SUS303Se	303Se S30323	—	Y12Cr18Ni9Se Y1Cr18Ni9Se	303S41	—	12X18H10E
SUS304	304 S30400	X5CrNi18-10 1.4301	0Cr18Ni9 06Cr19Ni10	304S31	Z6CN18.09	08X18H10
SUS304L	304L S30403	X2CrNi19-11 1.4306	00Cr19Ni10 022Cr19Ni10	304S11	Z2CN18.10	03X18H11
SUS304N1	304N S30451	X5CrNiN19-9 1.4315	06Cr19Ni10N 06Cr19Ni10NbN	—	Z6CN19-09Az	—
SUS305	305 S30500	X2CrNiN18-10 1.4311	1Cr18Ni12 10Cr18Ni12	305S19	Z8CN18.12	—
SUS309S	309S S30908	X6CrNi23-13 1.4950	0Cr23Ni13 06Cr23Ni13	—	—	0X23H12
SUS310S	310S S31008	X6CrNi25-20 1.4951	0Cr25Ni20 06Cr25Ni20	—	—	08X23H20
SUS316	316 S31600	X5CrNiMo17-12-2 1.4401	0Cr17Ni12Mo2 06Cr17Ni12Mo2	316S31	Z7CND17.12	—
SUS316L	316L S31603	X2CrNiMo17-12-2 1.4404	00Cr17Ni12Mo2 022Cr17Ni12Mo2	316S11	Z2CND17.12	03X17H14M2
SUS316N	316N S31651	—	0Cr17Ni12Mo2N 06Cr17Ni12Mo2N	—	—	—
SUS317	317 S31700	—	0Cr19Ni13Mo3 06Cr19Ni13Mo3	317S16	—	—
SUS317L	317L S31703	X2CrNiMo18-15-4 1.4438	00Cr19Ni13Mo3 022Cr19Ni13Mo3	317S12	Z2CND19.15	03X19H13M3
SUS321	321 S32100	X6CrNiTi18-10 1.4541	0Cr18Ni10Ti 06Cr18Ni1Ti	321S31	Z6CNT18.10	08X18H10T
SUS347	347 S34700	X6CrNiNb18-10 1.4550	0Cr18Ni11Nb 06Cr18Ni11Nb	347S31	Z6CNNb18.10	08X18H12Б

● Ferritic Heat Resistant Steels S

SUH409	409 S40900	X6CrTi12	06Cr11Ti 0Cr11T1	409S19	Z6CT12	—
SUH446	446 S44600	—	2Cr25N 16Cr25N	—	Z12C24	—

● Martensitic Heat Resistant Steel S

SUH1	—	—	45Cr9Si3	401S45	Z45CS9	—
SUH3	—	—	4Cr10Si2Mo 40Cr10Si2Mo	—	Z40CSD10	40X10C2M
SUH4	—	—	8Cr20Si2Ni 80Cr20Si2Ni	443S65	Z80CSN20.02	—

● Martensitic Heat Resistant Steel (continued) S

JIS	AISI/ASTM	DIN/EN	GB	BS	AFNOR	ГОСТ
SUH11	—	—	4Cr9Si2 42Cr9Si2	—	—	40X 9C2
SUH600	—	—	2Cr12MoVNbN 18Cr12MoVNbN	—	—	—
SUH616	616 S42200	—	2Cr12NiMoWV 22Cr12NiWMoV	—	—	—

● Austenitic Heat Resistant Steel S

SUH31	—	—	4Cr14Ni14W2Mo	331S42	—	45X14H14B2M
SUH35	—	X53CrMnNiN21-9-4 1.4871	5Cr21Mn9Ni4N 53Cr21Mn9Ni4N	349S52	Z52CMN21.09	55X20Г9AH4
SUH36	—	X53CrMnNi21 9	—	349S54	Z55CMN21-09Az	55X20Г9AH4
SUH37	—	X15CrNiSi20-12 1.4828	22Cr21Ni12N 2Cr21Ni12N	381S34	—	—
SUH38	—	—	—	—	—	—
SUH309	309 S30900	X12CrNi23-13 1.4833	16Cr23Ni13 2Cr23Ni13	309S24	Z15CN24.13	20X23H12
SUH310	310 S31000	—	2Cr25Ni21 20Cr25Ni20	310S24	Z15CN25.20	—
SUH330	—	X12CrNiMnMoN25-18-6-5 1.4565	1Cr16Ni35 12Cr16Ni35	—	Z12NCS35.16	—

● Gray Cast Iron K

FC100	No 20B	GG-10	HT100	100	—	Cy10
FC150	No 25B	GG-15	HT150	150	FGL150	Cy15
FC200	No 30B	GG-20	HT200	200	FGL200	Cy20
FC250	No 35B	GG-25	HT250	250	FGL250	Cy25
FC300	No 45B	GG-30	HT300	300	FGL300	Cy30
FC350	No 50B	GG-35	HT350	350	FGL350	Cy35

● Nodular Cast Iron K

FCD400	60-40-18	GGG-40	QT400-18	400/17	FGS370-17	By40
FCD450	—	GGG-40.3	QT450-10	420/12	FGS400-12	By45
FCD500	80-55-06	GGG-50	QT500-7	500/7	FGS500-7	By50
FCD600	—	GGG-60	QT600-3	600/7	FGS600-2	By60
FCD700	100-70-03	GGG-70	QT700-2	700/2	FGS700-2	By70
FCD800	120-90-02	GGG-80	—	800/2	FGS800-2	By80

● Aluminum and Al Alloys - Sheets, plates and strips N

A1060P	1060	EN AW-1060	L2	—	—	—
A1050P	1050	A199.50	1A50	—	—	—
A1100P	1100	EN AW-1100	L5-1	—	—	—
A1200P	1200	EN AW-1200	L5	EN AW-1200	EN AW-1200	—
A2014P	2014	EN AW-2014	LD10	EN AW-2014	EN AW-2014	—
A2017P	2017	EN AW-2017	2A11(LY11)	EN AW-2017	EN AW-2017	—
A2219P	2219	EN AW-2219	2A16(LY16)	—	—	—
A2024P	2024	EN AW-2024	2A12(LY12)	EN AW-2024	EN AW-2024	—
A2124P	2124	EN AW-2124	2A12(LY12)	—	—	—
A3003P	3003	EN AW-3003	LF21	EN AW-3003	EN AW-3003	—
A3004P	3004	EN AW-3004	3004	—	—	—
A3005P	3005	EN AW-3005	3005	—	—	—
A3015P	3105	EN AW-3105	3105	—	—	—
A5005P	5005	EN AW-5005	5005	—	—	—
A5050P	5050	EN AW-5050	—	—	—	—
A5052P	5052	EN AW-5052	5A02	EN AW-5052	EN AW-5052	—
A5154P	5154	—	LF3	—	—	—
A5254P	5254	—	LF3	—	—	—
A5454P	5454	EN AW-5454	5454	EN AW-5454	EN AW-5454	—
A5456P	5456	EN AW-5456	—			
A6101P	6101	EN AW-6101	6101			
A6061P	6061	EN AW-6061	6061(LD30)	EN AW-6061	EN AW-6061	—
A7075P	7075	EN AW-7075	7A04	EN AW-7075	EN AW-7075	—
A7178P	7178	EN AW-7178	7A03(LC3)	—	—	—

● Aluminum Alloy Die Castings N

ADC1	A413.0	EN AC-44300	YL102	—	—	—
ADC3	A360.0	EN AC-43400	YL104	EN AC-43400	EN AC-43400	—
ADC5	518.0	—	Al-Mg7	—	—	—
ADC10	—	EN AC-46000	YL112	—	—	—
ADC12	—	—	YL113	LM20	—	—
ADC14	B390.0	—	—	—	—	—
AC4C	357	G-AlSi7Mg	ZAlSi7Mg1A	LM25	A-S7G-03	—
AC4CH	356	G-AlSi7Mg	ZALSi7Mg	LM25	A-S7G	—
—	308	G-AlSi6Cu4	ZAlSi5Cu6Mg	LM21	—	—

● Hardened Steel H

C4BS	440A	X100CrMo13	7Cr17	—	—	—
AC4A	610	X110CrMoV15	—	—	—	—
AC4A	0-2	X65CrMo14	—	—	—	—

References

■ Steel and Non-Ferrous Metal Symbols Chart (Excerpt)

● Classifications and Symbols of Steels

Classification		Material	Symbol	Symbol Description
Structural Steel		Rolled steels for welded structures	SM	"M" for "Marine": Usually used in welded marine structures
		Re-rolled steels	SRB	"R" for "Re-rolled" and "B" for "Bar"
		Rolled steel for general structures	SS	S for "Steel" and S for "Structure"
		Light gauge sections for general structures	SSC	"C" for "Cold" after SS
Steel Sheets		Hot rolled mild steel sheets / plates in coil form	SPH	P for "Plate" and "H" for "Hot"
Steel Tubes		Carbon steel tubes for piping	SGP	"GP" for "Gas Pipe"
		Carbon steel tubes for boiler and heat exchangers	STB	"T" for "Tube" and "B" for "Boiler"
		Seamless steel tubes for high-pressure gas cylinders	STH	"H" for "High Pressure" after ST
		Carbon steel tubes for general structures	STK	"K" for "Kozo" ("structure" in Japanese) after ST
		Carbon steel tubes for mechanical structures	STKM	"M" for "Machine" after STK
		Alloy steel tubes for structures	STKS	"S" for "Special" after STK
		Alloy steel tubes for piping	STPA	"A" for "Alloy" after STP
		Carbon steel tubes for pressure piping	STPG	"P" for "Piping" and "G" for "General" after ST
		Carbon steel tubes for high-temperature piping	STPT	"T" for "Temperature" after ST
		Carbon steel tubes for high-pressure piping	STS	"S" for "Special" after ST
		Stainless steel tubes for piping	SUS-TP	"T" for "Tube" and "P" for "Piping" after SUS
Steel for Mechanical Structures		Carbon steels for mechanical structures	SxxC	"C" for "Carbon"
		Aluminum-chromium-molybdenum steels	SACM	"A" for "Al", "C" for "Cr" and "M" for "Mo"
		Chromium molybdenum steels	SCM	"C" for "Cr" and "M" for "Mo"
		Chromium steels	SCr	"Cr" for "Chromium" after "S" for "Steel"
		Nickel Chromium steels	SNC	"N" for "Nickel" and "C"for "Chromium"
		Nickel Chromium Molybdenum steels	SNCM	"M" for "Molybdenum" in SNC
		Manganese steels and manganese chromium steels for mechanical structures	SMn SMnC	"Mn" for "Manganese" "C" for "Chromium" in SMn
Special Steels	Tool Steels	Carbon tool steels	SK	"K" for "Kogu" ("tool" in Japanese)
		Hollow drill steels	SKC	"C" for "Chisel" after SK
		Alloy tool steel	SKS SKD SKT	S for "Special" after SK D for "Die" after SK T for "Tanzo" - ("forging" in Japanese) after SK
		High-speed tool steels	SKH	"H" for "High speed" after SK
	Stainless Steel	Free cutting sulphuric steels	SUM	"M" for "Machinability" after SU
		High-carbon chromium bearing steels	SUJ	"J" for "Jikuuke" ("bearing" in Japanese) after SU
		Spring steels	SUP	"P" for "Spring" after SU
		Stainless steel	SUS	"S" for "Stainless Steel" after SU
	Heat-resistant Steel	Heat-resistant steel	SUH	"U" for "Special Usage" and "H" for "Heat"
		Heat-resistant steel bars	SUH-B	"B" for "Bar" after SUH
		Heat-resistant steel sheets	SUHP	"P" for "Plate" after SUH
Forged Steels		Carbon steel forgings for general use	SF	"F" for "Forging"
		Carbon steel booms and billets for forgings	SFB	"B" for "Billet" after SF
		Chromium molybdenum steel forgings	SFCM	"C" for "Chromium" and "M" for "Molybdenum" after SF
		Nickel chromium molybdenum steel forgings	SFNCM	"N" for "Nickel" in SFCM
Cast Iron		Gray cast iron	FC	"F" for "Ferrous" and "C" for "Casting"
		Spherical graphite / Ductile cast irons	FCD	"D" for "Ductile" after FC
		Blackheart malleable cast irons	FCMB	"M" for "Malleable" and "B" for "Black" after FC
		Whiteheart malleable cast irons	FCMW	"W" for "White" after FCM
		Pearlite malleable cast iron	FCMP	"P" for "Pearlite" after FCM
Cast Steels		Carbon cast steels	SC	"C" for "Casting"
		Cast stainless steels	SCS	"S" for "Stainless Steel" after SC
		Heat-resistant cast steels	SCH	"H" for "Heat" after SC
		High-manganese cast steels	SCMnH	"Mn" for "Manganese" and "H" for "High" after SC

● Non-Ferrous Metals

Classification		Material	Symbol
Copper and Copper Alloys		Copper and copper alloys - sheets, plates and strips	CxxxxP
			CxxxxPP
			CxxxxR
		Copper and copper alloys - welded pipes and tubes	CxxxxBD
			CxxxxBDS
			CxxxxBE
			CxxxxBF
Aluminum and Aluminum Alloys		Aluminum and Al alloys - Sheets, plates and strips	AxxxxP
			AxxxxPC
		Aluminum and Al alloys Rods, bars and wires	AxxxxBE
			AxxxxBD
			AxxxxW
		Aluminum and Al alloys - Extruded shapes	AxxxxS
		Aluminum and Al alloy castings	AxxxxFD
			AxxxxFH
Material Wrought Alloys	Magnesium	Magnesium alloy sheets and plates	MP
Material Nickel		Nickel-copper alloy sheets and plates	NCuP
		Nickel-copper alloy rods and bars	NCuB
Wrought Materials	Titanium	Titanium rods and bars	TB
Castings		Brass castings	YBsCx
		High-strength brass castings	HBsCx
		Bronze castings	BCx
		Phosphorus Bronze castings	PBCx
		Aluminum bronze castings	AlBCx
		Aluminum alloy castings	AC
		Magnesium alloy castings	MC
		Zinc alloy die castings	ZDCx
		Aluminum alloy die castings	ADC
		Magnesium alloy die castings	MDC
		White metals	WJ
		Aluminum alloy castings for bearings	AJ
		Copper-lead alloy castings for bearings	KJ

References

■ Hardness Scale Comparison Chart

● Approximate corresponding values for steel hardness on the Brinell scale

Brinell 3,000kgf HB	Rockwell Hardness A Scale 60kgf brale HRA	Rockwell Hardness B Scale 100kgf 1/10in ball HRB	Rockwell Hardness C Scale 150kgf brale HRC	Rockwell Hardness D Scale 100kgf brale HRD	Vickers 50kgf HV	Shore Hardness HS	Tensile Strength (GPa)
—	85.6	—	68.0	76.9	940	97	—
—	85.3	—	67.5	76.5	920	96	—
—	85.0	—	67.0	76.1	900	95	—
767	84.7	—	66.4	75.7	880	93	—
757	84.4	—	65.9	75.3	860	92	—
745	84.1	—	65.3	74.8	840	91	—
733	83.8	—	64.7	74.3	820	90	—
722	83.4	—	64.0	73.8	800	88	—
712	—	—	—	—	—	—	—
710	83.0	—	63.3	73.3	780	87	—
698	82.6	—	62.5	72.6	760	86	—
684	82.2	—	61.8	72.1	740	—	—
682	82.2	—	61.7	72.0	737	84	—
670	81.8	—	61.0	71.5	720	83	—
656	81.3	—	60.1	70.8	700	—	—
653	81.2	—	60.0	70.7	697	81	—
647	81.1	—	59.7	70.5	690	—	—
638	80.8	—	59.2	70.1	680	80	—
630	80.6	—	58.8	69.8	670	—	—
627	80.5	—	58.7	69.7	667	79	—
601	79.8	—	57.3	68.7	640	77	—
578	79.1	—	56.0	67.7	615	75	—
555	78.4	—	54.7	66.7	591	73	2.06
534	77.8	—	53.5	65.8	569	71	1.98
514	76.9	—	52.1	64.7	547	70	1.89
495	76.3	—	51.0	63.8	528	68	1.82
477	75.6	—	49.6	62.7	508	66	1.73
461	74.9	—	48.5	61.7	491	65	1.67
444	74.2	—	47.1	60.8	472	63	1.59
429	73.4	—	45.7	59.7	455	61	1.51
415	72.8	—	44.5	58.8	440	59	1.46
401	72.0	—	43.1	57.8	425	58	1.39
388	71.4	—	41.8	56.8	410	56	1.33
375	70.6	—	40.4	55.7	396	54	1.26
363	70.0	—	39.1	54.6	383	52	1.22
352	69.3	(110.0)	37.9	53.8	372	51	1.18
341	68.7	(109.0)	36.6	52.8	360	50	1.13
331	68.1	(108.5)	35.5	51.9	350	48	1.10

Brinell 3,000kgf HB	Rockwell Hardness A Scale 60kgf brale HRA	Rockwell Hardness B Scale 100kgf 1/10in ball HRB	Rockwell Hardness C Scale 150kgf brale HRC	Rockwell Hardness D Scale 100kgf brale HRD	Vickers 50kgf HV	Shore Hardness HS	Tensile Strength (GPa)
321	67.5	(108.0)	34.3	50.1	339	47	1.06
311	66.9	(107.5)	33.1	50.0	328	46	1.03
302	66.3	(107.0)	32.1	49.3	319	45	1.01
293	65.7	(106.0)	30.9	48.3	309	43	0.97
285	65.3	(105.5)	29.9	47.6	301	—	0.95
277	64.6	(104.5)	28.8	46.7	292	41	0.92
269	64.1	(104.0)	27.6	45.9	284	40	0.89
262	63.6	(103.0)	26.6	45.0	276	39	0.87
255	63.0	(102.0)	25.4	44.2	269	38	0.84
248	62.5	(101.0)	24.2	43.2	261	37	0.82
241	61.8	100.0	22.8	42.0	253	36	0.80
235	61.4	99.0	21.7	41.4	247	35	0.78
229	60.8	98.2	20.5	40.5	241	34	0.76
223	—	97.3	(18.8)	—	234	—	—
217	—	96.4	(17.5)	—	228	33	0.73
212	—	95.5	(16.0)	—	222	—	0.71
207	—	94.6	(15.2)	—	218	32	0.69
201	—	93.8	(13.8)	—	212	31	0.68
197	—	92.8	(12.7)	—	207	30	0.66
192	—	91.9	(11.5)	—	202	29	0.64
187	—	90.7	(10.0)	—	196	—	0.62
183	—	90.0	(9.0)	—	192	28	0.62
179	—	89.0	(8.0)	—	188	27	0.60
174	—	87.8	(6.4)	—	182	—	0.59
170	—	86.8	(5.4)	—	178	26	0.57
167	—	86.0	(4.4)	—	175	—	0.56
163	—	85.0	(3.3)	—	171	25	0.55
156	—	82.9	(0.9)	—	163	—	0.52
149	—	80.8	—	—	156	23	0.50
143	—	78.7	—	—	150	22	0.49
137	—	76.4	—	—	143	21	0.46
131	—	74.0	—	—	137	—	0.45
126	—	72.0	—	—	132	20	0.43
121	—	69.8	—	—	127	19	0.41
116	—	67.6	—	—	122	18	0.40
111	—	65.7	—	—	117	15	0.38

1) Figures within the ( ) are not commonly used.
2) Rockwell A, C and D scales utilise a diamond brale.
3) This chart was taken from the JIS Iron and Steel Handbook (1980).

References

■ Dimensional Tolerance of Standard Fittings [Excerpt from JIS B 0401 (1999)]

● Dimensional Tolerance Used for Shafts of Standard Fittings

Unit: μm

Classification of Reference Dimensions (mm)		Shaft Tolerance Class																												
or greater	or less	b9	c9	d8	d9	e7	e8	e9	f6	f7	f8	g5	g6	h5	h6	h7	h8	h9	js5	js6	js7	k5	k6	m5	m6	n6	p6	r6	s6	t6	u6	x6
—	3	-140 -165	-60 -85	-20 -34	-20 -45	-14 -24	-14 -28	-14 -39	-6 -12	-6 -16	-8 -20	-2 -6	-2 -8	0 -4	0 -6	0 -10	0 -14	0 -25	±2	±3	±5	+4 0	+6 0	+6 +2	+8 +2	+10 +4	+12 +6	+16 +10	+20 +14	—	+24 +18	+26 +20
3	6	-140 -170	-70 -100	-30 -48	-30 -60	-20 -32	-20 -38	-20 -50	-10 -18	-10 -22	-10 -28	-4 -9	-4 -12	0 -5	0 -8	0 -12	0 -18	0 -30	±2.5	±4	±6	+6 +1	+9 +1	+9 +4	+12 +4	+16 +8	+20 +12	+23 +15	+27 +19	—	+31 +23	+36 +28
6	10	-150 -186	-80 -116	-40 -62	-40 -76	-25 -40	-25 -47	-25 -61	-13 -22	-13 -28	-13 -35	-5 -11	-5 -14	0 -6	0 -9	0 -15	0 -22	0 -36	±3	±4.5	±7.5	+7 +1	+10 +1	+12 +6	+15 +6	+19 +10	+24 +15	+28 +19	+32 +23	—	+37 +28	+43 +34
10	14	-150 -193	-95 -138	-50 -77	-50 -93	-32 -50	-32 -59	-32 -75	-16 -27	-16 -34	-16 -43	-6 -14	-6 -17	0 -8	0 -11	0 -18	0 -27	0 -43	±4	±5.5	±9	+9 +1	+12 +1	+15 +7	+18 +7	+23 +12	+29 +18	+34 +23	+39 +28	—	+44 +33	+51 +40
14	18																															+56 +45
18	24	-160 -212	-110 -162	-65 -98	-65 -117	-40 -61	-40 -73	-40 -92	-20 -33	-20 -41	-20 -53	-7 -16	-7 -20	0 -9	0 -13	0 -21	0 -33	0 -52	±4.5	±6.5	±10.5	+11 +2	+15 +2	+17 +8	+21 +8	+28 +15	+35 +22	+41 +28	+48 +35	—	+54 +41	+67 +54
24	30																													+54 +41	+61 +48	+77 +64
30	40	-170 -232	-120 -182	-80 -119	-80 -142	-50 -75	-50 -89	-50 -112	-25 -41	-25 -50	-25 -64	-9 -20	-9 -25	0 -11	0 -16	0 -25	0 -39	0 -62	±5.5	±8	±12.5	+13 +2	+18 +2	+20 +9	+25 +9	+33 +17	+42 +26	+50 +34	+59 +43	+64 +48	+76 +60	—
40	50	-180 -242	-130 -192																											+70 +54	+86 +70	
50	65	-190 -264	-140 -214	-100 -146	-100 -174	-60 -90	-60 -106	-60 -134	-30 -49	-30 -60	-30 -76	-10 -23	-10 -29	0 -13	0 -19	0 -30	0 -46	0 -74	±6.5	±9.5	±15	+15 +2	+21 +2	+24 +11	+30 +11	+39 +20	+51 +32	+60 +41	+72 +53	+85 +66	+106 +87	—
65	80	-200 -274	-150 -224																									+62 +43	+78 +59	+94 +75	+121 +102	
80	100	-220 -307	-170 -257	-120 -174	-120 -207	-72 -107	-72 -126	-72 -159	-36 -58	-36 -71	-36 -90	-12 -27	-12 -34	0 -15	0 -22	0 -35	0 -54	0 -87	±7.5	±11	±17.5	+18 +3	+25 +3	+28 +13	+35 +13	+45 +23	+59 +37	+73 +51	+93 +71	+113 +91	+146 +124	—
100	120	-240 -327	-180 -267																									+76 +54	+101 +79	+126 +104	+166 +144	
120	140	-260 -360	-200 -300	-145 -208	-145 -245	-85 -125	-85 -148	-85 -185	-43 -68	-43 -83	-43 -106	-14 -32	-14 -39	0 -18	0 -25	0 -40	0 -63	0 -100	±9	±12.5	±20	+21 +3	+28 +3	+33 +15	+40 +15	+52 +27	+68 +43	+88 +63	+117 +92	+147 +122	—	—
140	160	-280 -380	-210 -310																									+90 +65	+125 +100	+159 +134		
160	180	-310 -410	-230 -330																									+93 +68	+133 +108	+171 +146		
180	200	-340 -455	-240 -355	-170 -242	-170 -285	-100 -146	-100 -172	-100 -215	-50 -79	-50 -96	-50 -122	-15 -35	-15 -44	0 -20	0 -29	0 -46	0 -72	0 -115	±10	±14.5	±23	+24 +4	+33 +4	+37 +17	+46 +17	+60 +31	+79 +50	+106 +77	+151 +122	—	—	—
200	225	-380 -495	-260 -375																									+109 +80	+159 +130			
225	250	-420 -535	-280 -395																									+113 +84	+169 +140			
250	280	-480 -610	-300 -430	-190 -271	-190 -320	-110 -162	-110 -191	-110 -240	-56 -88	-56 -108	-56 -137	-17 -40	-17 -49	0 -23	0 -32	0 -52	0 -81	0 -130	±11.5	±16	±26	+27 +4	+36 +4	+43 +20	+52 +20	+66 +34	+88 +56	+126 +94	—	—	—	—
280	315	-540 -670	-330 -460																									+130 +98				
315	355	-600 -740	-360 -500	-210 -299	-210 -350	-125 -182	-125 -214	-125 -265	-62 -98	-62 -119	-62 -151	-18 -43	-18 -54	0 -25	0 -36	0 -57	0 -89	0 -140	±12.5	±18	±28.5	+29 +4	+40 +4	+46 +21	+57 +21	+73 +37	+98 +62	+144 +108	—	—	—	—
355	400	-680 -820	-400 -540																									+150 +114				
400	450	-760 -915	-440 -595	-230 -327	-230 -385	-135 -198	-135 -232	-135 -290	-68 -108	-68 -131	-68 -165	-20 -47	-20 -60	0 -27	0 -40	0 -63	0 -97	0 -155	±13.5	±20	±31.5	+32 +5	+45 +5	+50 +23	+63 +23	+80 +40	+108 +68	+166 +126	—	—	—	—
450	500	-840 -995	-480 -635																									+172 +132				

References

■ Dimensional Tolerance of Standard Fittings [Excerpt from JIS B 0401 (1999)]

● Dimensional Tolerance Used for Holes of Standard Fittings

Unit: μm

Classification of Reference Dimensions (mm)		Hole Tolerance Class																														
or greater	or less	B10	C9	C10	D8	D9	D10	E7	E8	E9	F6	F7	F8	G6	G7	H6	H7	H8	H9	H10	JS6	JS7	K6	K7	M6	M7	N6	N7	P6	P7	R7	S7	T7	U7	X7
—	3	+180 +140	+85 +60	+100 +60	+34 +20	+45 +20	+60 +20	+24 +14	+28 +14	+39 +14	+12 +6	+16 +6	+20 +6	+8 +2	+12 +2	+6 0	+10 0	+14 0	+25 0	+40 0	±3	±5	0 -6	0 -10	-2 -8	-2 -12	-4 -10	-4 -14	-6 -12	-6 -16	-10 -20	-14 -24	—	-18 -28	-20 -30
3	6	+188 +140	+100 +70	+118 +70	+48 +30	+60 +30	+78 +30	+32 +20	+38 +20	+50 +20	+18 +10	+22 +10	+28 +10	+12 +4	+16 +4	+8 0	+12 0	+18 0	+30 0	+48 0	±4	±6	+2 -6	+3 -9	-1 -9	0 -12	-5 -13	-4 -16	-9 -17	-8 -20	-11 -23	-15 -27	—	-19 -31	-24 -36
6	10	+208 +150	+116 +80	+138 +80	+62 +40	+76 +40	+98 +40	+40 +25	+47 +25	+61 +25	+22 +13	+28 +13	+35 +13	+14 +5	+20 +5	+9 0	+15 0	+22 0	+36 0	+58 0	±4.5	±7.5	+2 -7	+5 -10	-3 -12	0 -15	-7 -16	-4 -19	-12 -21	-9 -24	-13 -28	-17 -32	—	-22 -37	-28 -43
10	14	+220 +150	+138 +95	+165 +95	+77 +50	+93 +50	+120 +50	+50 +32	+59 +32	+75 +32	+27 +16	+34 +16	+43 +16	+17 +6	+24 +6	+11 0	+18 0	+27 0	+43 0	+70 0	±5.5	±9	+2 -9	+6 -12	-4 -15	0 -18	-9 -20	-5 -23	-15 -26	-11 -29	-16 -34	-21 -39	—	-26 -44	-33 -51
14	18																																	-38 -56
18	24	+244 +160	+162 +110	+194 +110	+98 +65	+117 +65	+149 +65	+61 +40	+73 +40	+92 +40	+33 +20	+41 +20	+53 +20	+20 +7	+28 +7	+13 0	+21 0	+33 0	+52 0	+84 0	±6.5	±10.5	+2 -11	+6 -15	-4 -17	0 -21	-11 -24	-7 -28	-18 -31	-14 -35	-20 -41	-27 -48	—	-33 -54	-46 -67
24	30																															-33 -54	-40 -61	-56 -77
30	40	+270 +170	+182 +120	+220 +120	+119 +80	+142 +80	+180 +80	+75 +50	+89 +50	+112 +50	+41 +25	+50 +25	+64 +25	+25 +9	+34 +9	+16 0	+25 0	+39 0	+62 0	+100 0	±8	±12.5	+3 -13	+7 -18	-4 -20	0 -25	-12 -28	-8 -33	-21 -37	-17 -42	-25 -50	-34 -59	-39 -64	-51 -76	—
40	50	+280 +180	+192 +130	+230 +130																												-45 -70	-61 -86	
50	65	+310 +190	+214 +140	+260 +140	+146 +100	+174 +100	+220 +100	+90 +60	+106 +60	+134 +60	+49 +30	+60 +30	+76 +30	+29 +10	+40 +10	+19 0	+30 0	+46 0	+74 0	+120 0	±9.5	±15	+4 -15	+9 -21	-5 -24	0 -30	-14 -33	-9 -39	-26 -45	-21 -51	-30 -60	-42 -72	-55 -85	-76 -106	—
65	80	+320 +200	+224 +150	+270 +150																											-32 -62	-48 -78	-64 -94	-91 -121	
80	100	+360 +220	+257 +170	+310 +170	+174 +120	+207 +120	+260 +120	+107 +72	+126 +72	+159 +72	+58 +36	+71 +36	+90 +36	+34 +12	+47 +12	+22 0	+35 0	+54 0	+87 0	+140 0	±11	±17.5	+4 -18	+10 -25	-6 -28	0 -35	-16 -38	-10 -45	-30 -52	-24 -59	-38 -73	-58 -93	-78 -113	-111 -146	—
100	120	+380 +240	+267 +180	+320 +180																											-41 -76	-66 -101	-91 -126	-131 -166	
120	140	+420 +260	+300 +200	+360 +200	+208 +145	+245 +145	+305 +145	+125 +85	+148 +85	+185 +85	+68 +43	+83 +43	+106 +43	+39 +14	+54 +14	+25 0	+40 0	+63 0	+100 0	+160 0	±12.5	±20	+4 -21	+12 -28	-8 -33	0 -40	-20 -45	-12 -52	-36 -61	-28 -68	-48 -88	-77 -117	-107 -147	—	—
140	160	+440 +280	+310 +210	+370 +210																											-50 -90	-85 -125	-119 -159		
160	180	+470 +310	+330 +230	+390 +230																											-53 -93	-93 -133	-131 -171		
180	200	+525 +340	+355 +240	+425 +240	+242 +170	+285 +170	+355 +170	+146 +100	+172 +100	+215 +100	+79 +50	+96 +50	+122 +50	+44 +15	+61 +15	+29 0	+46 0	+72 0	+115 0	+185 0	±14.5	±23	+5 -24	+13 -33	-8 -37	0 -46	-22 -51	-14 -60	-41 -70	-33 -79	-60 -106	-105 -151	—	—	—
200	225	+565 +380	+375 +260	+445 +260																											-63 -109	-113 -159			
225	250	+605 +420	+395 +280	+465 +280																											-67 -113	-123 -169			
250	280	+690 +480	+430 +300	+510 +300	+271 +190	+320 +190	+400 +190	+162 +110	+191 +110	+240 +110	+88 +56	+108 +56	+137 +56	+49 +17	+69 +17	+32 0	+52 0	+81 0	+130 0	+210 0	±16	±26	+5 -27	+16 -36	-9 -41	0 -52	-25 -57	-14 -66	-47 -79	-36 -88	-74 -126	—	—	—	—
280	315	+750 +540	+460 +330	+540 +330																											-78 -130				
315	355	+830 +600	+500 +360	+590 +360	+299 +210	+350 +210	+440 +210	+182 +125	+214 +125	+265 +125	+98 +62	+119 +62	+151 +62	+54 +18	+75 +18	+36 0	+57 0	+89 0	+140 0	+230 0	±18	±28.5	+7 -29	+17 -40	-10 -46	0 -57	-26 -62	-16 -73	-51 -87	-41 -98	-87 -144	—	—	—	—
355	400	+910 +680	+540 +400	+630 +400																											-93 -150				
400	450	+1010 +760	+595 +440	+690 +440	+327 +230	+385 +230	+480 +230	+198 +135	+232 +135	+290 +135	+108 +68	+131 +68	+165 +68	+60 +20	+83 +20	+40 0	+63 0	+97 0	+155 0	+250 0	±20	±31.5	+8 -32	+18 -45	-10 -50	0 -63	-27 -67	-17 -80	-55 -95	-45 -108	-103 -166	—	—	—	—
450	500	+1090 +840	+635 +480	+730 +480																											-109 -172				

References

■ Dimensional Tolerance and Fittings [Excerpt from JIS B 0401 (1999)]

● Standard Fittings for Holes

Reference Hole	Shaft Tolerance Class																
	Gap fitting							Intermediate fitting			Tight fitting						
H6						g5	h5	js5	k5	m5							
					f6	g6	h6	js6	k6	m6	n6*	p6*					
H7					f6	g6	h6	js6	k6	m6	n6	p6*	r6*	s6	t6	u6	x6
				e7	f7		h7	js7									
H8					f7		h7										
				e8	f8		h8										
			d9	e9													
H9			d8	e8			h8										
		c9	d9	e9			h9										
H10	b9	c9	d9														

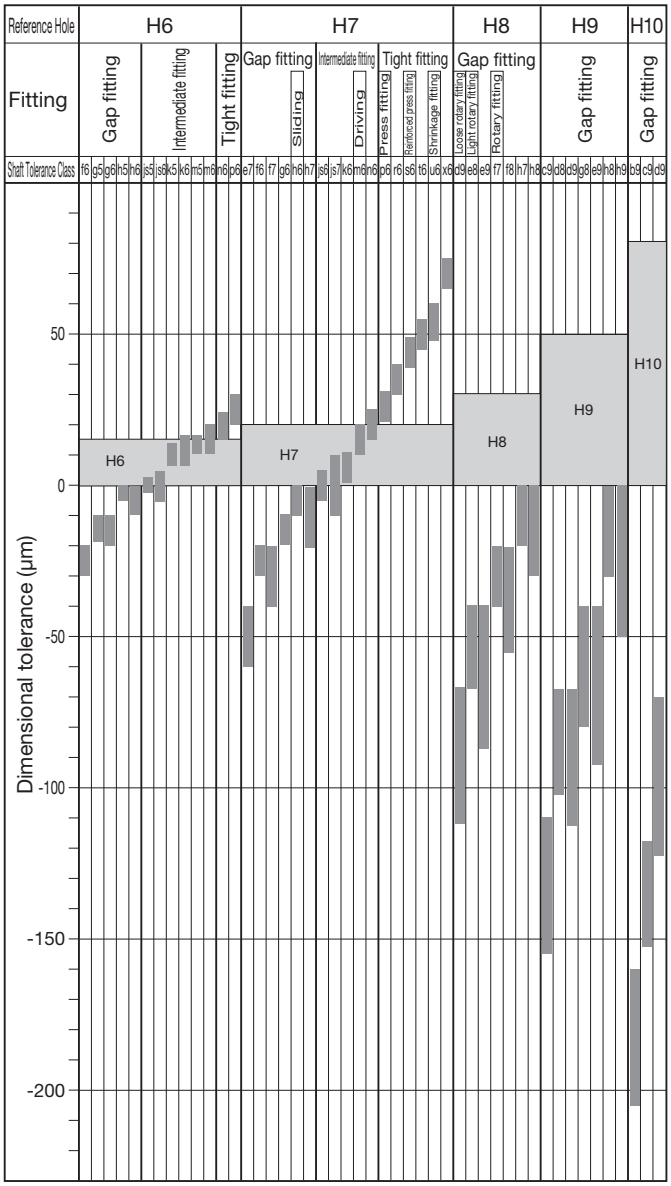
Note: *Exceptions may arise with these fittings depending on the dimension category.

● Standard Fittings for Shafts

Reference Shaft	Hole Tolerance Class																
	Gap fitting							Intermediate fitting			Tight fitting						
h5							H6	JS6	K6	M6	N6*	P6					
h6					F6	G6	H6	JS6	K6	M6	N6	P6*					
					F7	G7	H7	JS7	K7	M7	N7	P7*	R7	S7	T7	U7	X7
h7				E7	F7		H7										
					F8		H8										
h8			D8	E8	F8		H8										
			D9	E9			H9										
h9			D8	E8			H8										
		C9	D9	E9			H9										
	B10	C10	D10														

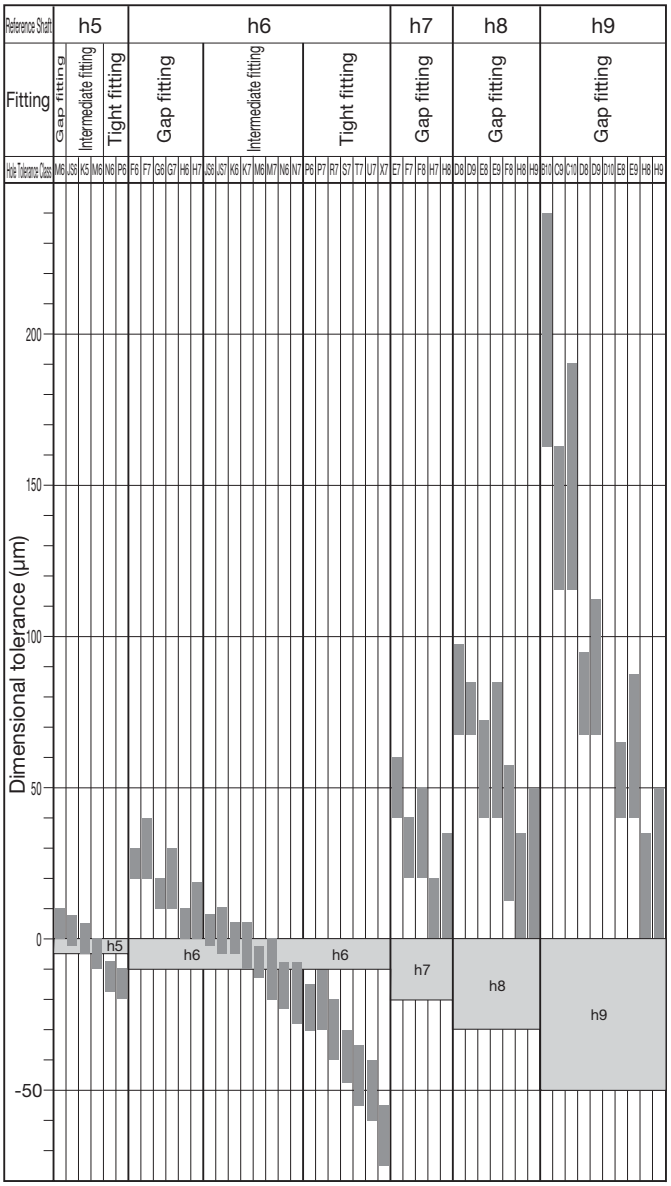
Note: *Exceptions may arise with these fittings depending on the dimension category.

● Correlation of Tolerance Zones in Standard Hole Fittings



Note: The above table is for reference dimensions greater than 18mm up to 30mm.

● Correlation of Tolerance Zones in Standard Shaft Fittings



Note: The above table is for reference dimensions greater than 18mm up to 30mm.

References

■ Standard of Tapers

● Morse Taper

Fig 1 With Tang

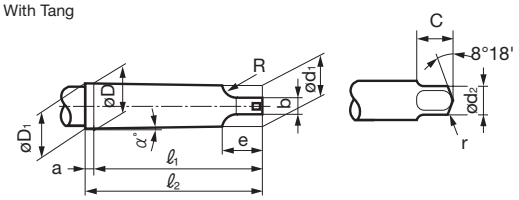
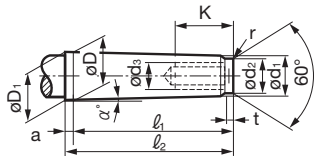


Fig 2 Drawing Thread type



(Unit: mm)

Morse Taper Number	Taper (1)		Taper Angle (α)	Taper						Tang						Fig
				D	a	D_1(2) (approx.)	d_1(2) (approx.)	ℓ_1 (Max)	ℓ_2 (Max)	d_2 (Max)	b	C (Max)	e (Max)	R	r	
0	1/19.212	0.05205	1°29'27"	9.045	3	9.2	6.1	56.5	59.5	6.0	3.9	6.5	10.5	4	1	1
1	1/20.047	0.04988	1°25'43"	12.065	3.5	12.2	9.0	62.0	65.5	8.7	5.2	8.5	13.5	5	1.2	
2	1/20.020	0.04995	1°25'50"	17.780	5	18.0	14.0	75.0	80.0	13.5	6.3	10	16	6	1.6	
3	1/19.922	0.05020	1°26'16"	23.825	5	24.1	19.1	94.0	99.0	18.5	7.9	13	20	7	2	
4	1/19.245	0.05194	1°29'15"	31.267	6.5	31.6	25.2	117.5	124.0	24.5	11.9	16	24	8	2.5	
5	1/19.002	0.05263	1°30'26"	44.399	6.5	44.7	36.5	149.5	156.0	35.7	15.9	19	29	10	3	
6	1/19.180	0.05214	1°29'36"	63.348	8	63.8	52.4	210.0	218.0	51.0	19.0	27	40	13	4	
7	1/19.231	0.05200	1°29'22"	83.058	10	83.6	68.2	286.0	296.0	66.8	28.6	35	54	19	5	

Morse Taper Number	Taper (1)		Taper Angle (α)	Taper						Screw					Fig
				D	a	D_1(2) (approx.)	d_1(2) (approx.)	ℓ_1 (Max)	ℓ_2 (Max)	d_2 (Max)	d_3	K (Min)	t (Max)	r	
0	1/19.212	0.05205	1°29'27"	9.045	3	9.2	6.4	50	53	6	—	—	4	0.2	2
1	1/20.047	0.04988	1°25'43"	12.065	3.5	12.2	9.4	53.5	57	9	M 6	16	5	0.2	
2	1/20.020	0.04995	1°25'50"	17.780	5	18.0	14.6	64	69	14	M10	24	5	0.2	
3	1/19.922	0.05020	1°26'16"	23.825	5	24.1	19.8	81	86	19	M12	28	7	0.6	
4	1/19.254	0.05194	1°29'15"	31.267	6.5	31.6	25.9	102.5	109	25	M16	32	9	1	
5	1/19.002	0.05263	1°30'26"	44.399	6.5	44.7	37.6	129.5	136	35.7	M20	40	9	2.5	
6	1/19.180	0.05214	1°29'36"	63.348	8	63.8	53.9	182	190	51	M24	50	12	4	
7	1/19.231	0.05200	1°29'22"	83.058	10	83.6	70.0	250	260	65	M33	80	18.5	5	

Note (1) The fractional values are the taper standards.

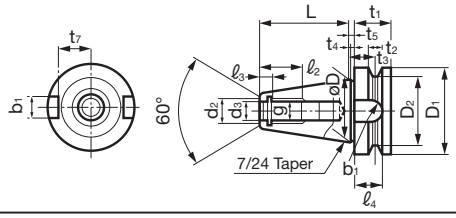
(2) Diameters D_1 and d_1 are calculated from the diameter D value, the taper, a, and ℓ_1 and rounded up to one decimal place.

Remark 1. Tapers are measured using JIS B 3301 ring gauges. The contact rate must be at least 75%.

2. Screws must have metric coarse screw thread as per JIS B 0205 and Class 3 precision as per JIS B 0209.

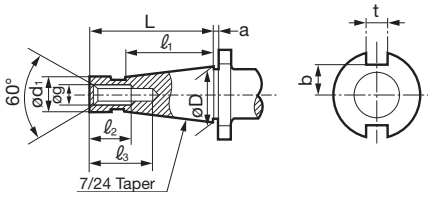
● Bottle Grip Taper

Fig 3



● American Standard Taper (National Taper)

Fig 4



● Bottle Grip Taper

(Units: mm)

Taper No.	D (Standard Dimensions)	D_1	D_2	t_1	t_2	t_3	t_4	t_5	d_2	d_3	L	ℓ_2	ℓ_3	ℓ_4	g	b_1	t_7	Fig
BT30	31.75	46	38	20	8	13.6	2	2	14	12.5	48.4	24	7	17	M12	16.1	16.3	3
BT35	38.10	53	43	22	10	14.6	2	2	14	12.5	56.4	24	7	20	M12	16.1	19.6	
BT40	44.45	63	53	25	10	16.6	2	2	19	17	65.4	30	8	21	M16	16.1	22.6	
BT45	57.15	85	73	30	12	21.2	3	3	23	21	82.8	36	9	26	M20	19.3	29.1	
BT50	69.85	100	85	35	15	23.2	3	3	27	25	101.8	45	11	31	M24	25.7	35.4	
BT60	107.95	155	135	45	20	28.2	3	3	33	31	161.8	56	12	34	M30	25.7	60.1	

● American Standard Taper (National Taper)

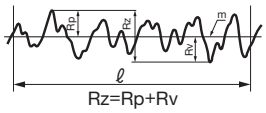
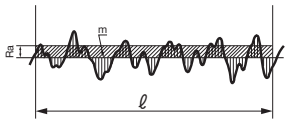
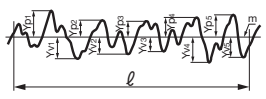
(Units: mm)

Taper No.	Nominal Size	D	d_1		L	ℓ_1(Min)	ℓ_2(Min)	ℓ_3 (Min)	g	a	t	b	Fig
30	$1^1/_{4}$"	31.750	17.4	$^{-0.29}_{-0.36}$	68.4	48.4	24	34	$^1/_2$"	1.6	15.9	16	4
40	$1^3/_{4}$"	44.450	25.3	$^{-0.30}_{-0.384}$	93.4	65.4	32	43	$^5/_8$"	1.6	15.9	22.5	
50	$2^3/_{4}$"	69.850	39.6	$^{-0.31}_{-0.41}$	126.8	101.8	47	62	1"	3.2	25.4	35	
60	$4^1/_{4}$"	107.950	60.2	$^{-0.34}_{-0.46}$	206.8	161.8	59	76	$1^1/_{4}$"	3.2	25.4	60	

References

■ Surface Roughness

● Types and Definitions of Typical Surface Roughness

Type	Symbol	Method of Determination	Descriptive Figure
R Max.	*1) Rz	This value is found by extracting the reference length in the mean line direction from the surface roughness curve, measuring the intervals between the peaks and valleys in the extracted area in the longitudinal magnification direction of the surface roughness curve, and expressing this value in micrometres (μm). Remarks: When finding Rz, any areas deemed to be scratches are removed before extracting the reference length from an area with no high peaks or low valleys.	 Rz=Rp+Rv
Calculated Roughness	Ra	This value is found by extracting the reference length in the mean line direction from the roughness curve, taking the average line direction of the extracted area as the X-axis and the longitudinal magnification direction as the Y-axis and expressing the value found by the equation below in micrometres (μm) with the roughness curve expressed by y=f(x).	 $Ra=\frac{1}{\ell}\int_0^{\ell}\{f(x)\}dx$
10-point Average Roughness	*2) Rz JIS	This value is found by extracting the reference length in the mean line direction from the roughness curve, finding the sum of the mean absolute peak height taken from the five highest peaks (Yp) and the mean absolute valley height taken from the five lowest valleys (Yv) measured in the longitudinal magnification direction from the mean line direction of the extracted area and expressing this value in micrometres (μm).	 $Rz_{JIS}=\frac{(Yp1+Yp2+Yp3+Yp4+Yp5)+(Yv1+Yv2+Yv3+Yv4+Yv5)}{5}$

Designated values for the above types of maximum height (Rz)*1), 10-point average roughness (Rz_{JIS}*2), calculated average roughness (Ra) classifications, and reference length ℓ are shown on the table at right with triangular symbols.

*1) The maximum height symbol (Rz) is calculated according to the new **JIS B 0601**:2001 standard. (This value was Ry under the old standard.)

*2) The 10-point average roughness (Rz_{JIS}) is calculated according to the new **JIS B 0601**:2001 standard. (This value was Rz under the old standard.)

● Relationship with Triangular Symbol Display

Designated values for maximum height *1) (Rz)	Designated values for calculated average roughness (Ra)	Designated values for 10-point average roughness *2) (Rz_{JIS})	Standard reference ℓ length value (mm)	Triangular * symbols
(0.05) 0.1 0.2 0.4	(0.012) 0.025 0.05 0.10	(0.05) 0.1 0.2 0.4	0.25	▽▽▽▽
0.8	0.20	0.8		
1.6 3.2 6.3	0.40 0.80 1.6	1.6 3.2 6.3	0.8	▽▽▽
12.5 (18) 25	3.2 6.3	12.5 (18) 25	2.5	▽▽
(35) 50 (70) 100	12.5 25	(35) 50 (70) 100	8	▽
(140) 200 (280) 400 (560)	(50) (100)	(140) 200 (280) 400 (560)	—	—

Remarks: The designated values in ( ) do not apply unless otherwise stated.

* Finish symbols (triangular symbol (▽) and tilde (~)) were removed from JIS in the 1994 revision.