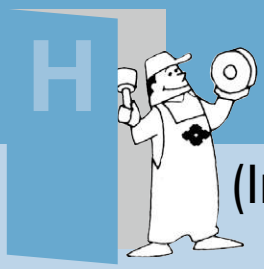


Milling Cutters H

(Indexable Endmills) H1 to H124

Stock Indications and Symbols

●● mark: Standard stocked item
● mark: To be replaced by a new item featured on the same page
▲ mark: To be replaced by new item (Please confirm stock availability)
＊ mark: Semi-standard stock (Please confirm stock availability)
○○ mark: Stock or planned stock (Please confirm stock availability)
No mark: Made-to-order item
— mark: We cannot produce

Milling Cutter/Indexable Endmill Selection Guide

◎: Best ○: Good ×: Unsuitable Blank: Not recommended

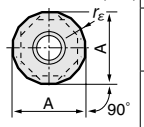
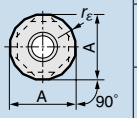
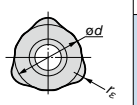
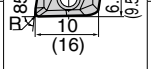
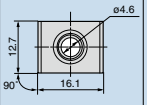
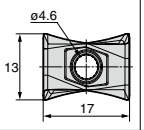
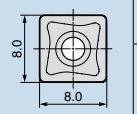
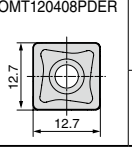
Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle Axial	Rake Angle Radial	Application: Face Milling – General Purpose	Face Milling – Finishing	Face Milling – High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	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 Metal	N – Aluminium Alloy	S – Ti Alloy/Heat Resistant Alloy	H – Hardened Steel 45 to 55 HRC	Ref. Page
Face Milling	6mm 45°	ø40 to ø250	–	WGX →H18	WGX13000R(S) WGXM13000R(S) WGXF13000R(S)	SEMT13T3AGSR-G	20° to 22°	−20° to −24°	◎				○						◎	◎	◎	◎	◎	◎	○		H18
	6mm 45°	ø32 to ø63	ø32	WGX-EW →H18	WGX13000EW	SEMT13T3AGSR-G	20° to 22°	−20° to −24°	◎				○						◎	◎	◎	◎	◎	◎	○		H18
	4mm 45°	ø32 to ø100	–	WGC →H26	WGC3000 WGC3000RS	SEMT0903AGSN (3000 Type)	20°	−10° to −19°	◎				○						◎	◎	◎	◎	◎	◎	◎		H26
	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 →H27	WGC3000EW	SEMT13T3AGSN (4000 Type)	20°	−10° to −19°	◎				○						◎	◎	◎	◎	◎	◎	◎		H27
	6mm 45°	ø32 to ø63	ø32		WGC4000EW		20° to 22°	−20° to −24°																			
	6mm 45° 3mm 45°	ø40 to ø250	–	DGC →H28	DGC13000R(S) DGCM13000R(S) DGCF13000R(S)	SNMT13T6ANER-G	-5° 7	−10°	◎				○						◎	◎	◎	◎	◎	◎	○		H28
	6mm 45° 3mm 45°	ø40 to ø63	ø32	DGC-EW →H28	DGC13000EW	SNMT13T6ANER-G	-5° 7	−10°	◎				○						◎	◎	◎	◎	◎	◎	○		H28
	5.5mm 45°	ø80 to ø250	–	UFO →H36	UFO4000	SFKN12T3AZTN(A= 12.70) SFKN1504AZTN(A=15.875)	27°	−7°	○				○						○	○	○	○	○	○	○		H36
	7.5mm 45°	ø100 to ø250	–		UFO5000		27°	−7°																			
	5.5mm 45°	ø50 to ø80	ø32 to ø42	UFO-E →H38	UFO4000E	SFKN12T3AZTN	27°	−7°	○				○						○	○	○	○	○	○	○		H38
	6.5mm 45°	ø80 to ø315	–	FPG →H39	FPG4000	SDKN42M(A=12.70) SDKN53M(A=15.875)	15°	−4°	○				○						○	○	○	○					H39
	8.5mm 45°	ø100 to ø200	–		FPG5000		15°	−4°																			
	6.5mm 45°	ø50 to ø80	ø32 to ø42	FPE →H40	FPE4000	SDKN42MT	15°	−3°	○				○						○	○	○	○		○			H40
	5.5mm 45°	ø80 to ø200	–	EHG →H41	EHG4000	SEKN42MT(A=12.70) SEKN53MT(A=15.875)	20°	−3°	○				○						○	○	○	○	○		○		H41
	7.5mm 45°	ø(80) to ø(200)	–		EHG5000		20°	−3°																			

◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle		Application										Work Material									Ref. Page
									Face Milling			Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	P		M	K	N		S	H	
				Ref. Page			Axial	Radial	General Purpose	Finishing	High Feed								General Steel/Carbon Steel/Alloy Steel	Tempered Steel/Die Steel	Stainless Steel	Cast Iron/Ductile Cast Iron	Non-Ferrous Metal	Aluminium Alloy	Ti Alloy/Heat Resistant Alloy	Hardened Steel 45 to 55 HRC	
Face Milling	8mm 65°	ø80 to ø250	–	DNX →H42	**DNX**12000 **DNXF**12000	SNMT1205ZNEN	−5°	−6°	○				○						○			◎						H42
	3mm 24° 5mm 24°	ø80 to ø160	–	DNH(S) →H42	**DNH**12000 **DNHS**12000	SNMT1205ZNEN	−5°	−6°			○								○			◎						H42
	6.5mm 65°	ø80 to ø200	–	DNF →H46	**DNF**4000	CSNH43M	−5°	−6°	○				○						○			◎	×	×	×			H46
	7mm 65°	ø80 to ø315	–	APG →H47	**APG**4000	SDC(H)42TR	18°	−2°	○				○						○	○	○	○	◎	◎		×		H47
	9.5mm 75°	ø80 to ø200	–	DPG →H48	**DPG**4000 **DPGF**4000	SPCH42(A=12.70) SPCH53(A=15.875)	8°	0°	○				○						○	○	○	○	○	○				H48
	12mm 75°	ø100 to ø315	–		**DPG**5000		8°	0°																				
	10mm	ø80 to ø160	–	GRC →H50	**GRC**6000	RGEN2004SN-S	25°	10°	○				○							○	○	◎	◎		◎	○		H50
Radius Milling	0.5mm	ø12 to ø20	ø10 to ø25	BRC-ES →H51, L112	**BRC-ES**	RDHX0701M0T	0°	0°		◎									×	×	×	◎ (FC)				◎		H51 L118
	0.5mm	ø42 to ø66	–	BRC-R →H51, L112	**BRC-R**	RDHX1003M0T	0°	0°		◎									×	×	×	◎ (FC)				◎		H51 L118
	5mm	ø40 to ø52	–	RSX →H52	**RSX**10000 **RSXF**10000	RDET10T3M0EN	10°	−5°	◎				○	◎	◎						◎				◎			H52
	6mm	ø40 to ø100			**RSX**12000 **RSXF**12000		10°	−5°																				
	8mm	ø63 to ø160			**RSX**16000 **RSXF**16000		10°	−5°																				
	5mm	ø25 to ø32	ø25 to ø32	RSX-ES →H52	**RSX**10000ES **RSXF**10000ES	RDET10T3M0EN	10°	−5°	◎				○	◎	◎						◎				◎			H52
	6mm	ø32	ø32		**RSX**12000ES **RSXF**12000ES		10°	−5°																				

Milling Cutter/Indexable Endmill Selection Guide

◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle Axial	Rake Angle Radial	Application: Face Milling: General Purpose	Application: Face Milling: Finishing	Application: Face Milling: High Feed	Application: Shoulder Milling	Application: Slot Milling	Application: Ramping	Application: Copying	Application: Chamfering	Application: Boring	Application: Finishing	Work Material: P: General Steel/Carbon Steel/Alloy Steel	Work Material: P: Tempered Steel/Die Steel	Work Material: M: Stainless Steel	Work Material: K: Cast Iron/Ductile Cast Iron	Work Material: N: Non-Ferrous Metal	Work Material: N: Aluminium Alloy	Work Material: S: Ti Alloy/Heat Resistant Alloy	Work Material: H: Hardened Steel 45 to 55 HRC	Ref. Page
Radius Milling	6mm	ø40 to ø80	–	WRCX  →H59	**WRCX**12000 **WRCXF**12000	QPMT120440PPEN(A=12) QPMT160660PPEN(A=16) QPMT200670PPEN(A=20) 	−3°	0°	◎				○	◎	◎				◎	◎	◎	◎			○	○	H59
	8mm	ø63 to ø100	–		**WRCX**16000 **WRCXF**16000		−3°	0°	◎				○	◎	◎				◎	◎	◎	◎		◎	○	○	H59
	10mm	ø125 to ø160	–		**WRCX**20000		−3°	0°	◎				○	◎	◎				◎	◎	◎	◎			○	○	H59
	4mm	ø20 to ø25	ø20 to ø25	WRCX-E  →H59	**WRCX**08000E	QPMT080330PPEN(A=8) QPMT10T335PPEN(A=10) QPMT160660PPEN(A=16) 	−3°	0°	◎				○	◎	◎				◎	◎	◎	◎		◎	○	○	H59
	5mm	ø25 to ø32	ø25 to ø32		**WRCX**10000E		−3°	0°																			
	8mm	ø40 to ø50	ø32		**WRCX**16000E		−3°	0°																			
Multi-functional Milling	1.5 to 2.5mm 20°	ø40 to ø100	–	MSX-R →H64	**MSX**08000R **MSX**12000R **MSX**14000R	WDMT0603ZDTR(*d*=6.35) WDMT0804ZDTR(*d*=8.5) WDMT1204ZDTR(*d*=12) WDMT1406ZDTR(*d*=14) 	8°	−3° to −8°			◎		○	○						◎	◎	◎	◎			○	H64
	1.0 to 2.5mm 20°	ø16 to ø63	ø16 to ø42	MSX-E  →H64	**MSX**06000E **MSX**08000E **MSX**12000E		8°	−3° to −8°			◎		○	○					◎	◎	◎	◎			○	H64
	17 to 35mm 90°	ø20 to ø30	ø20 to ø25	WMM  →H68	**WMM**2000E/EL **WMM**2000ELH	APMT103504PDER APMT160508PDER 	7° to 11°	15° to 16°	◎			◎	◎	◎	◎		◎		◎	◎	◎	◎	◎	◎			H68
	39mm 90°	ø32 to ø40	ø32		**WMM**3000E/EL **WMM**3000ELH		7° to 11°	17° to 19°																			
Semi-Shouldering	15mm 88°	ø80 to ø200	–	PWC  →H70	**PWC**4000 **PWCF**4000	LNMX160608PNSN-G 	−5°	−15°	○		◎	○	○									◎					H70
Shoulder Milling	16mm 90°	ø80 to ø250	–	PWS  →H71	**PWS**4000 **PWSF**4000	LNMX170808PNSR-G 	−6°	−15°	○		◎	◎	○						◎	○	○	○					H71
	6mm 90°	ø40 to ø100	–	WFX Expansion  →H74	**WFX**08000R(S) **WFXM**08000R(S) **WFXF**08000R(S)	SOMT080304PZER 	12°	−6°	○			◎	○						◎	◎	◎	◎	◎	◎	○		H74
	10mm 90°	ø50 to ø250	–		**WFX**12000R(S) **WFXF**12000R(S)		8°	−8°																			
	6mm 90°	ø20 to ø63	ø16 to ø32	WFX-E Expansion  →H74	**WFX**08000E **WFXM**08000E	SOMT120408PDER 	12°	−6°	○			◎	○						◎	◎	◎	◎	◎	◎	○		H74
	10mm 90°	ø40 to ø80	ø32		**WFX**12000E **WFXF**12000E		8°	−8°																			

◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle Axial	Rake Angle Radial	Application: Face Milling: General Purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	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 Metal	N: Aluminium Alloy	S: Ti Alloy/Heat Resistant Alloy	H: Hardened Steel 45 to 55 HRC	Ref. Page
Shoulder Milling	10mm 90°	ø40 to ø63	–	WEX-F/R →H84	WEX2000F	(3000 Type) AXMT170508PEER-G	23° to 25°	16° to 18°				◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H84
	14mm 90°	ø40 to ø125	–		WEX3000F WEX3000R WEXF3000R		19° to 24°	12° to 15°																			
	10mm 90°	ø14 to ø63	ø16 to ø32	WEX-E →H84	WEX2000E WEX2000EL	(2000 Type) AXMT123504PEER-G	14° to 25°	10° to 18°	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H84
	14mm 90°	ø25 to ø63	ø20 to ø42		WEX3000E(-C) WEX3000ES(-C) WEX3000EL		16° to 24°	8° to 5°																			
	18 to 36mm 90°	ø40 to ø50	–	WRX-R →H92	WRX2000R	(3000 Type) AXMT170508PEER-G	24°	16° to 17°				◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H92
	22 to 40mm 90°	ø50° to ø100	–		WRX3000R		22° to 24°	13° to 15°	○																		
	18 to 36mm 90°	ø20 to ø40	ø20 to ø42	WRX-E →H92	WRX2000E	(2000 Type) AXMT123504PEER-G	16° to 24°	13° to 16°				◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H92
	27 to 53mm 90°	ø40 to ø50	ø32 to ø42		WRX3000E		20° to 22°	12° to 13°	○																		
	16mm 90°	ø80 to ø200	–	CHG →H98	CHG4000	TEKN43TR	15°	4°				○	○						◎	○	○	○	○	◎			H98
	8mm 90°	ø16 to ø28	ø16 to ø25	CHE →H99	CHE2000	TECN22R(A=6.35) TECN32R(A=9.525) TEEN43R(A=12.70)	6° to 15°	−3° to 0°				○	○						○	○	○	○	○	○			H99
	13mm 90°	ø30 to ø40	ø32		CHE3000		15°	−3° to 0°																			
	16mm 90°	ø50 to ø80	ø32 to ø42		CHE4000		15°	2° to 4°																			
	18mm 90°	ø80 to ø200	–	CPG →H101	CPG4000	TPCH43TR	6°	0°				○	○						○	○	○	○	○				H101
	8 to 19mm 90°	ø16 to ø60	ø16 to ø42	FMS →H102	FMS	TPCH43TR	3° to 7°	−4° to −6°				○	○						○	○	○	○	○				H102
Radius Milling, 3D Profiling	20 to 43mm	R10 (ø20) to R25 (ø50)	ø25 to ø50.8	WBMR →H103	WBMR2000 WBMR2000L	ZNMT1804100-C	−10°	—					◎		◎				◎	◎	◎	◎			○	○	H103
	0.1 to 0.4mm	R5 (ø10) to R15 (ø30)	ø16 to ø32	WBMF →H103	WBMF1000	ZPGU1551050	0°	—					◎		◎			◎	◎	◎	◎	◎				○	H103

Milling Cutter/Indexable Endmill Selection Guide

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Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle		Application										Work Material								Ref. Page
									Face Milling			Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	P		M	K	N		S	H	
				Ref. Page			Axial	Radial	General Purpose	Finishing	High Feed								General Steel/Carbon Steel/Alloy Steel	Tempered Steel/Die Steel	Stainless Steel	Cast Iron/Ductile Cast Iron	Non-Ferrous Metal	Aluminium Alloy	Ti Alloy/Heat Resistant Alloy	Hardened Steel 45 to 55 HRC	
Radius Milling, 3D Profiling	0.4 to 0.7mm	R8 (ø16) to R25 (ø50)	ø20 to ø50	BES →L117	**BES**	BEST160S(L) R8 6.8 10 (13) 13	0°	0°							◎			◎	×	×	×	◎				×	L117
Groove Milling	4 to 8mm 88 30	ø100 to ø160	–	TSM →H106	**TSM**	SNHG121 12.70 12.70	−2°	−12°					○						○	○	○	○					H106
T Slot	9 to 22mm 90°	ø21 to ø50	ø25 to ø32	TSE →H106	**TSE**	CPMT060204N-US R 6.35	0°	0°					○						○	○	○						H106
Chamfering	45°	ø8 to ø32	ø14 to ø20	SCP →H107	**SCP**	SDMA322 R0.8 9.525 (12.70)	0°	0°								◎			○	○	○	○					H107
	45°	ø7 to ø35	ø32	SMC →H107	**SMC**	SPMN422 R 12.70	0°	0°								◎			○	○	○	○					H107
Milling of Non-Ferrous Metal	3mm 90°	ø80 to ø125	–	HF New →H108	**HFM**12000 **HFF**12000	NF-LDEN12T3ZDFR 12.7 6.0 9.525			◎	◎									×	×	×	×	○	◎		×	H108
	3mm 90°	ø80 to ø200	–	RF →H112, M22	**RF**4000	NF-SNEW1204ADFR 4.7 12.70	10°	4°	◎	◎									×	×	×	×	○	◎		×	H112 M30
	5mm 90°	ø30 to ø63	–	SRF →H114, M24	**SRF**	NF-SNEW09T3ADTR 9.525 6 C0.5 9.525	6°	−2° to 4°	◎	◎		○							×	×	×	×	○	◎		×	H114 M32
			ø20		**SRF-ST**																						
	16 to 18mm 90°	ø50 to ø125	–	WAX →H116	**WAX**3000	(3000 Type) AECT160404PEFRA 18 0.4 1.4 16.4	19° to 25°	6°	○			◎	◎	◎	◎				×	×	×	×	○	◎		×	H116
	22 to 24mm 90°		–		**WAX**4000																						H116
	16 to 18mm 90°	ø20 to ø40	ø20 to ø32	WAX-E →H116	**WAX**3000E **WAX**3000EL	(4000 Type) AECT220604PEFRA 24 0.4 1.5 21.8	19° to 25°	6°	○			◎	◎	◎	◎				×	×	×	×	○	◎		×	H116
	22 to 24mm 90°	ø25 to ø40	ø25 to ø32		**WAX**4000E **WAX**4000EL																						H116

◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle		Application										Work Material									Ref. Page
									Face Milling			Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	P		M	K	N		S	H	
				Ref. Page			Axial	Radial	General Purpose	Finishing	High Feed								General Steel/Cartoon Steel/Alloy Steel	Tempered Steel/Die Steel	Stainless Steel	Cast Iron/Ductile Cast Iron	Non-Ferrous Metal	Aluminium Alloy	Ti Alloy/Heat Resistant Alloy	Hardened Steel 45 to 55 HRC		
Milling of Non-Ferrous Metal	5.8mm / 65°	ø80 to ø200	–	FAM →M26	**FAM**	FABR	13°	4°	○	○									×	×	×	×	○	○		×		M34
	5.7mm / 90°	ø80 to ø100	–	SAM →M26	**SAM**	SABR	10°	6°	○	○		○							×	×	×	×	○	○		×		M34
	5.7mm / 90°	ø50 to ø80	ø32	SAM-E →M27	**SAM-E**	SABR	10°	0° to 2°	○	○		○							×	×	×	×	○	○		×		M35
High Speed Milling of Cast Iron	0.5mm / 90°	ø37 to ø200	–	FMU →H119, L114	**FMU FMU-E**	SNEW1203ADTR	8°	2°		◎									×	×	×	◎ (FC)	×	×	×	×		H119 L114
	0.5mm / 90°	ø80 to ø160	–	FM →L116	**FM FMF**	SNEN1504ADTR(L)	8°	2°		◎									×	×	×	◎ (FC)	×	×	×	×		L116
	3mm / 75°	ø80 to ø160	–	RM →H120, L113	**RM**	SNGN0903	−5° 45'	−6° 45'	○	◎									×	×	×	◎ (FC)	×	×	×	×		H120 L113

Milling Cutter (Special Purpose) Selection Guide

◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle Axial	Rake Angle Radial	Application: Face Milling: General Purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	Work Material: P: General Steel/Cartoon Steel/Alloy Steel	P: Tempered Steel/Die Steel	M: Stainless Steel	K: Cast Iron/Ductile Cast Iron	N: Non-Ferrous Metal	N: Aluminium Alloy	S: Ti Alloy/Heat Resistant Alloy	H: Hardened Steel 45 to 55 HRC	Ref. Page
High Feed Cutting	8mm 45°	ø80 to ø315	–	GRV →H134	GRV16000	LNMX160608PNSN-G	−5°	−14° to −6°			◎								×	×	×	◎	×	×	×	×	H134
	8mm 65°	ø192 to ø347	–	GSV →H134	GSV16000	LNMX160608PNSN-G	−5°	−14° to −5°		◎	◎								×	×	×	◎	×	×	×	×	H134
	1mm 89°~89°30'	ø80 to ø315	–	GFX →H134	GFX16000 GFX13000	LNGX160516PNFN-W	−5°	−8°		◎	◎								×	×	×	◎	×	×	×	×	H134
	10mm 90°	ø80 to ø160	–	GFS →H134	GFS13000	LNGX130508PNFN-W	−3°	−11°		◎	◎	○							×	×	×	◎	×	×	×	×	H134
Milling Cutters (Special Purpose)	5.5mm 45°	ø100 to ø450	–	NRV →H144	NRV4000	SNMN433 SNC535	−5°	−6°			◎								×	×	×	◎	×	×	×	×	H144
	8.5mm 45°		–		NRV5000																						
	7mm 65°	ø100 to ø450	–	DPV →H144	DPV4000	SDCN42R(A=12.70) SDCN53R(A=15.875)	10°	5°		○	◎								×	×	×	◎	×	×	×	×	H144
	7.5mm 65°	ø100 to ø450	–		DPV5000		10°	5°																			H144
	0.5mm 90°	ø100 to ø450	–	NFV →H145	NFV4000	SNEF43W(A=12.70) SNEF53W(A=15.875)	−5°	−6°		◎	◎								×	×	×	◎	×	×	×	×	H145
	0.5mm 90°	ø100 to ø450	–		NFV5000		−5°	−6°		◎	◎								×	×	×	◎	×		×	×	H145
	10mm 65°	ø200 to ø450	–	APV →H145	APV5000	SDC53R	18°	−2°		◎	◎								×	×	×		◎	○		×	H145

Modular Tool Selection Guide

G: Best S: Good H: Unsuitable Blank: Not recommended

Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle		Application										Work Material								Ref. Page
				Ref. Page			Axial	Radial	Face Milling			Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	P		M	K	N		S	H	
									General Purpose	Finishing	High Feed								General Steel/Carbon Steel/Alloy Steel	Tempered Steel/Die Steel	Stainless Steel	Cast Iron/Ductile Cast Iron	Non-Ferrous Metal	Aluminium Alloy	Ti Alloy/Heat Resistant Alloy/Alloy	Hardened Steel 45 to 55 HRC	
Radius Milling	4mm	ø25 to ø32	ø23 to ø32	RSX-M Modular New →H128	**RSX**10000M **RSXF**10000M	RDET10T3M0EN-G	10°	−5° to −8°	◎				○	◎	◎						◎				◎		H128
	6mm	ø32 to ø40	ø28 to ø32		**RSX**12000M **RSXF**12000M																						
Shoulder Milling	6mm 90°	ø20 to ø40	ø18 to ø32	WFX-M Modular New →H129	**WFX**08000M	SOMT080304PZER-G	12°	−6°	○				◎	◎					◎	◎	◎	◎	◎	◎	○		H129
Shoulder Milling	10mm 90°	ø16 to ø40	ø15 to ø32	WEX-M Modular →H130	**WEX**2000M	AXMT170504PEER-G	14° to 25°	10° to 18°	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H130
	14mm 90°	ø25 to ø40	ø23 to ø32		**WEX**3000M		16° to 24°	8° to 15°																			
Radius Milling	4mm	ø20 to ø25	ø18 to ø25	WRCX-M Modular →H131	**WRCX**08000M	QPMT10T335PPEN	−3°	0°	◎				○	◎	◎				◎	◎	◎	◎		◎	○	○	H131
	5mm	ø25 to ø32	ø23 to ø32		**WRCX**10000M																						
	6mm	ø40	ø28 to ø32		**WRCX**12000M																						
Multi-functional Milling	1.0mm 20°	ø16 to ø25	ø15 to ø25	MSX-M Modular →H132	**MSX**06000M	WDMT0804ZDTR	8°	−3° to −8°			◎		○	○					◎	◎	◎	◎				○	H132
	1.5mm 20°	ø25 to ø35	ø23 to ø32		**MSX**08000M																						
	2.0mm 20°	ø32 to ø40	ø28 to ø32		**MSX**12000M																						

(*) Shank diameters in the table are those of shanks with corresponding arbors. Refer to page H127 for details.

Indexable Endmill Selection Guide

◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description (Ref. Page)	Series	Insert Cat. No. and Diagram	Rake Angle Axial	Rake Angle Radial	Application: Face Milling: General Purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	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 Metal	N: Aluminium Alloy	S: Ti Alloy/Heat Resistant Alloy	H: Hardened Steel 45 to 55 HRC	Ref. Page
Face Milling	6mm 45° / 3mm 45°	ø32 to ø63	ø32	WGX-EW →H18	**WGX**13000EW	SEMT13T3AG SR-G	20° to 22°	−20° to −24°	◎				○						◎	◎	○	○					H18
	4mm 45°	ø20 to ø63	ø20 to ø32	WGC-EW →H27	**WGC**3000EW	SEMT13T3AGSN (4000 Type)	20°	−10° to −19°	◎				○						◎	◎	◎	◎	◎	◎	◎		H27
	6mm 45°	ø32 to ø63	ø32		**WGC**4000EW		20° to 22°	−20° to −24°																			
	6mm 45° / 3mm 45°	ø40 to ø63	ø32	DGC-EW →H28	**DGC**13000EW	SNMT13T6ANER-G	−5° 7	−10°	◎				○						◎	◎	○	○					H28
	5.5mm 45°	ø50 to ø80	ø32 to ø42	UFO-E →H38	**UFO**4000E	SFKN12T3AZTN	27°	−7°	○				○						○	○	○	○	○	○	○		H38
	6.5mm 45°	ø50 to ø80	ø32 to ø42	FPE →H40	**FPE**4000	SDKN42MT	15°	−3°	○				○						○	○	○	○		○			H40
Radius Milling	0.5mm	ø12 to ø20	ø10 to ø25	BRC-ES →H51	**BRC-ES**	RDHX0701M0T	0°	0°		◎									×	×	×	◎ (FC)				◎	H51 L118
	5mm	ø25 to ø32	ø25 to ø32	RSX-ES →H52	**RSX**10000ES **RSXF**10000ES	RDET10T3M0EN	10°	−5°	◎				○	◎	◎						◎				◎		H52
	6mm	ø32	ø32		**RSX**12000ES **RSXF**12000ES		10°	−5°																			
	4mm	ø20 to ø25	ø20 to ø25	WRCX-E →H59	**WRCX**08000E	QPMT080330PPEN(A=8) QPMT10T335PPEN(A=10) QPMT160660PPEN(A=16)	−3°	0°	◎				○	◎	◎				◎	◎	◎	◎		◎	○	○	H59
	5mm	ø25 to ø32	ø25 to ø32		**WRCX**10000E		−3°	0°																			
	8mm	ø40 to ø50	ø32		**WRCX**16000E		−3°	0°																			
Multi-functional Milling	1.0 to 2.5mm 20°	ø16 to ø63	ø16 to ø42	MSX-E →H64	**MSX**06000E **MSX**08000E **MSX**12000E	WDMT0603ZDTR(d=6.35) WDMT0804ZDTR(d=8.5) WDMT1204ZDTR(d=12) WDMT1406ZDTR(d=14)	8°	−3° to −8°			◎		○	○					◎	◎	◎	◎				○	H64
	17 to 35mm 90°	ø20 to ø30	ø20 to ø25	WMM →H68	**WMM**2000E/EL **WMM**2000ELH	APMT103504PDER APMT160508PDER	7° to 11°	15° to 16°	◎			◎	◎	◎	◎		◎		◎	◎	◎	◎	◎	◎	◎		H68
	39mm 90°	ø32 to ø40	ø32		**WMM**3000E/EL **WMM**3000ELH		7° to 11°	17° to 19°																			
Shoulder Milling	6mm 90°	ø20 to ø63	ø16 to ø32	WFX-E →H74	**WFX**08000E **WFXM**08000E	SOMT120408PDER	12°	−6°	○			◎	○						◎	◎	◎	◎	◎	◎			H74
	10mm 90°	ø40 to ø80	ø32		**WFX**12000E **WFXF**12000E		8°	−8°																			

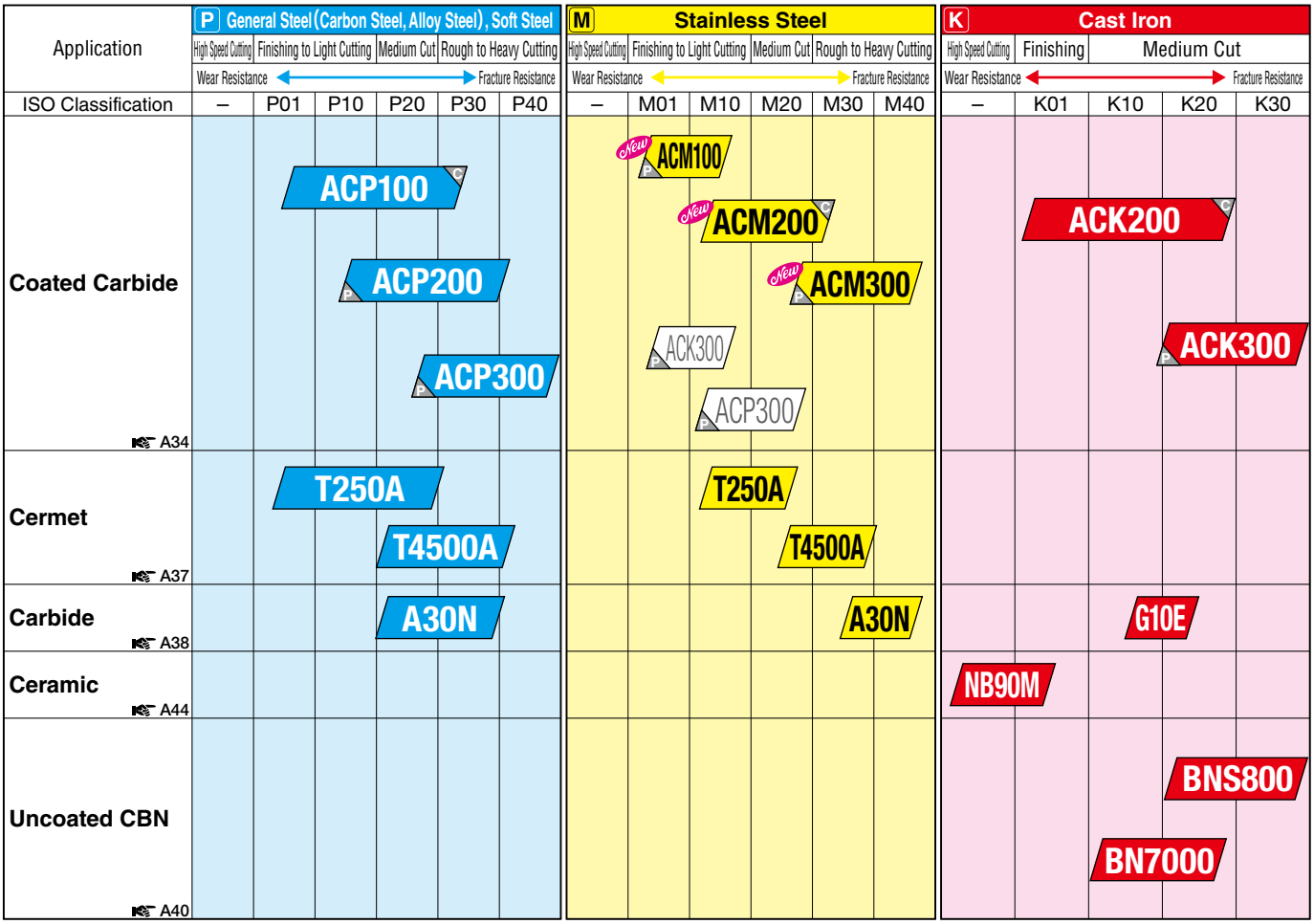
Indexable Endmill Selection Guide

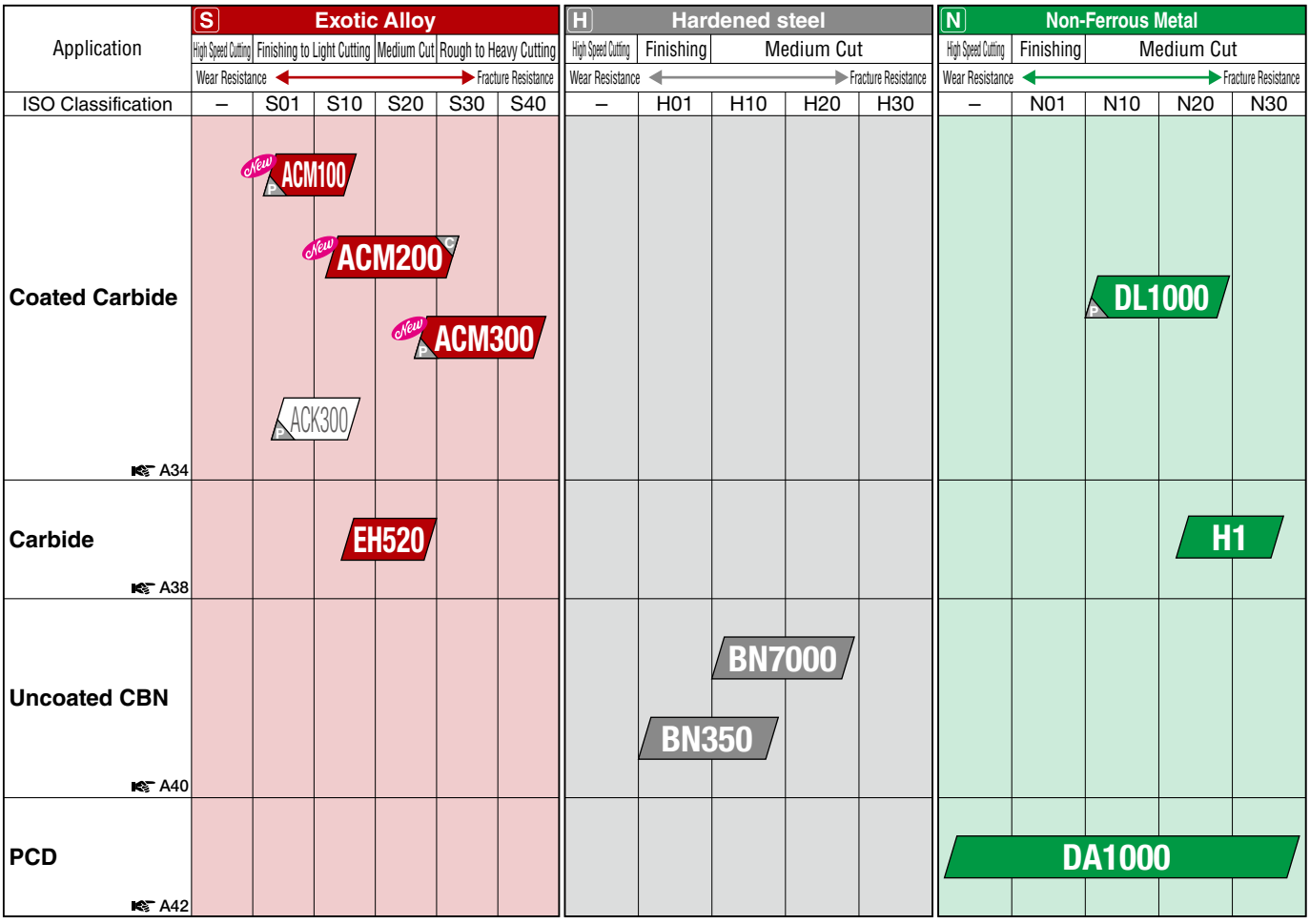
◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Approach Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle Axial	Rake Angle Radial	Application: Face Milling: General Purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	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 Metal	N: Aluminium Alloy	S: Ti Alloy/Heat Resistant Alloy	H: Hardened Steel 45 to 55 HRC	Ref. Page
Shoulder Milling	10mm 90°	ø14 to ø63	ø16 to ø32	WEX-E →H84	WEX2000E WEX2000EL	(2000Type) AXMT123504PEER-G	14° to 15°	10° to 18°	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H84
	14mm 90°	ø25 to ø63	ø20 to ø42		WEX3000E(-C) WEX3000ES(-C) WEX3000EL		16° to 24°	8° to 15°																			
	18 to 36mm 90°	ø20 to ø40	ø20 to ø42	WRX-E →H92	WRX2000E	(2000Type) AXMT123504PEER-G	16° to 24°	13° to 16°	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H92
	27 to 53mm 90°	ø40 to ø50	ø32 to ø42		WRX3000E		20° to 22°	12° to 13°																			
	8mm 90°	ø16 to ø28	ø16 to ø25	CHE →H99	CHE2000	TECN22R(A=6.35) TECN32R(A=9.525) TEEN43R(A=12.70)	6° to 15°	-3° to 0°				○	○						○	○	○	○	○	○			H99
	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 →H102	FMS	TPCH43TR	3° to 7°	-4° to -6°				○	○						○	○	○	○	○				H102
Radius Milling, 3D Profiling	20 to 43mm	R10 (ø20) to R25 (ø50)	ø25 to ø50.8	WBMR →H103	WBMR2000 WBMR2000L	ZNMT1804100-C	-10°	—					◎		◎				◎	◎	◎	◎			○	○	H103
	0.1 to 0.4mm	R5 (ø10) to R15 (ø30)	ø16 to ø32	WBMF →H103	WBMF1000	ZPGU1551050	0°	—					◎		◎			◎	◎	◎	◎	◎				○	H103
	0.4 to 0.7mm	R8 (ø16) to R25 (ø50)	ø20 to ø50	BES →L117	BES	BEST160S(L)	0°	0°							◎			◎	×	×	×	◎				×	L117
T Slot	9 to 22mm 90°	ø21 to ø50	ø25 to ø32	TSE →H106	TSE	CPMT060204N-US	0°	0°					○						○	○	○						H106
Chamfering	45°	ø8 to ø32	ø14 to ø20	SCP →H107	SCP	SDMA322	0°	0°								◎			○	○	○	○					H107
	45°	ø7 to ø35	ø32	SMC →H107	SMC	SPMN422	0°	0°								◎			○	○	○	○					H107
Milling of Non-Ferrous Metal	16 to 18mm 90°	ø20 to ø40	ø20 to ø32	WAX-E →H116	WAX3000E WAX3000EL	(4000Type) AECT220604PEFRA	19° to 25°	6°	○			◎	◎	◎	◎				×	×	×	×	○	◎		×	H116
	22 to 24mm 90°	ø25 to ø40	ø25 to ø32		WAX4000E WAX4000EL																						

Explanation of Milling Grades

Selection of Sumitomo Grades (Milling)





: First recommended grade : Second recommended grade : CVD coating : PVD coating Blank : Non-coated

Explanation of Milling Grades

Characteristic

CVD coating

Classification	Grade	Hardness(HRA)	Toughness(GPa)	Coating Type	Coating Thickness(μm)	Characteristics	Old Grades
P Steel	ACP100	89.3	3.1	Super FF Coat	6	A grade that employs a tough carbide substrate and thin-layer Super FF Coat to provide superior thermal crack and wear resistance in high-speed milling of steel.	AC230
M Stainless steel	New ACM200	89.8	3.4	Super FF Coat	6	A grade ideal for hardened steel machining that provides excellent wear and heat resistance by employing a newly developed high strength carbide and Super FF Coating.	AC230
K Cast Iron	ACK200	91.7	2.5	Super FF Coat	6	A grade that employs a tough carbide substrate and thin-layer Super FF Coat to provide superior thermal crack and wear resistance for high-speed milling.	AC211

PVD coating

Classification	Grade	Hardness(HRA)	Toughness(GPa)	Coating Type	Coating Thickness(μm)	Characteristics	Old Grades
P Steel	ACP200	89.5	3.2	(New) Super ZX Coat	3	• General machining of general steel and die steel. • Employs PVD coating of multiple nanometre-thick layers coupled with a special tough substrate to provide a general-purpose grade with an excellent balance of fracture and wear resistance.	ACZ330
	ACP300	89.3	3.1	(New) Super ZX Coat	3	• Interrupted machining and stainless steel machining. • Employs PVD coating of multiple nanometre-thick layers coupled with an ultra-tough substrate for excellent fracture resistance.	ACZ350
M Stainless steel	New ACM100	91.4	3.3	(New) Super ZX Coat	3	• A grade that provides excellent wear resistance by employing high strength fine-grained carbide and New Super ZX Coating.	ACZ310
	New ACM300	89.8	3.4	(New) Super ZX Coat	3	• The first recommended grade for stainless steel machining that achieves a good balance between wear resistance and fracture resistance by employing our newly developed high strength carbide and New Super ZX Coating.	—
K Cast Iron	ACK300	91.4	3.3	(New) Super ZX Coat	3	• General to interrupted machining of cast iron and ductile cast iron. • Employs PVD coating of multiple nanometre-thick layers coupled with a fine-grained super tough substrate for excellent fracture resistance.	ACZ310
N Non-Ferrous Metal	DL1000	92.9	2.1	AURORA Coat (DLC Coat)	0.5	• For machining aluminium alloy, copper alloy, and other non-ferrous metals, and resin. • DLC coat with low friction coefficient and excellent adhesion resistance.	—

Cermet

Classification	Grade	Hardness(HRA)	Toughness(GPa)	Coating Type	Coating Thickness(μm)	Characteristics	Old Grades
P Steel	T1500A	92.0	2.2	—	—	A general purpose grade that employs a substrate with improved balance of fracture and wear resistance to deliver superior finished surfaces in a wide variety of cutting conditions.	T1200A
M Stainless steel	T250A	91.4	2.1	—	—	Tough cermet grade with enhanced crack spread resistance.	—
	T4500A	91.0	2.3	—	—	Cermet grade with excellent fracture resistance and reduced occurrence of thermal cracking.	—

CBN Layer

Classification	Grade	Binder	Content(%)	Grain Size(μm)	HardnessHV(GPa)	Toughness(GPa)	Main Coating Components	Coating Thickness(μm)	Characteristics
K Cast Iron	BN7000	Co Alloy	90 to 95	2	41 to 44	1.30 to 1.40	—	—	Improved wear and fracture resistance in rough cutting of cast iron and exotic alloy.
	BNS800	Al Alloy	85 to 90	8	39 to 42	0.95 to 1.10	—	—	Grade with 100% solid CBN structure and excellent thermal shock resistance.
	BN500	TiC	65 to 70	6	32 to 34	1.00 to 1.10	—	—	Optimised for cast iron cutting. Provides superior wear and fracture resistance.
H hardened steel	BN350	TiN	60 to 65	1	33 to 35	1.20 to 1.30	—	—	High cutting edge strength, suited to heavy interrupted cutting.

Polycrystalline Diamond

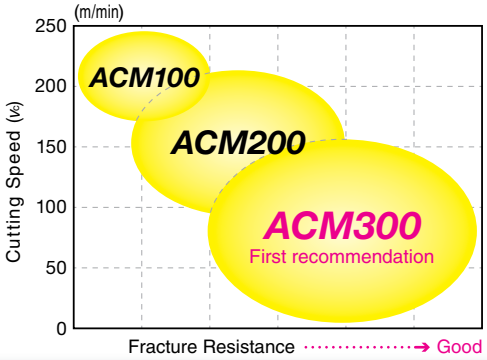
Classification	Grade	Binder	Content(%)	Grain Size(μm)	HardnessHV(GPa)	Toughness(GPa)	Characteristics
N Non-Ferrous Metal	DA1000	Co	90 to 95	Up to 0.5	110 to 120	≈ 2.60	High density sintered material made of ultra-fine diamond particles that demonstrates optimum wear and fracture resistance, and excellent edge sharpness.

Carbide ☞ A38

Ceramic ☞ A44

ACM Series

New



Grade

New ACM100

A PVD grade that provides excellent wear resistance by employing high strength, fine-grained carbide and our new Super ZX Coating.

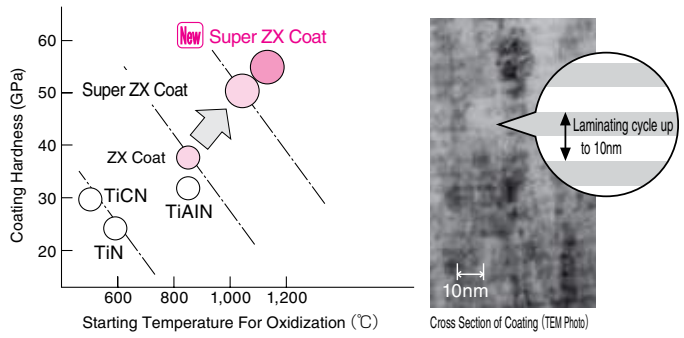
New ACM200

A CVD grade ideal for hardened steel machining that provides excellent wear and heat resistance by employing a newly developed high strength carbide and Super FF Coating.

New ACM300

The first recommended PVD grade for stainless steel machining that achieves a good balance between wear resistance and fracture resistance by employing newly developed high strength carbide and our new Super ZX Coating.

Characteristics



NEW Super ZX Coat

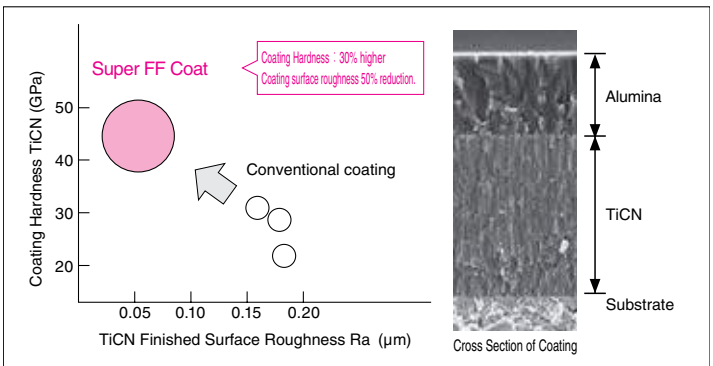
(PVD : **P**hysical **V**apor **D**eposition)

ACM100 / ACM300

Compared to conventional PVD grades, the coating hardness has been increased by 40% and the oxidization starting temperature has been increased by 200°C.

High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible by reviewing the coating layer composition to drastically improve the adhesion resistance.

Achieves over 2 times longer tool life compared to conventional grades under the same cutting conditions.



Super FF Coat

(CVD : **C**hemical **V**apor **D**eposition)

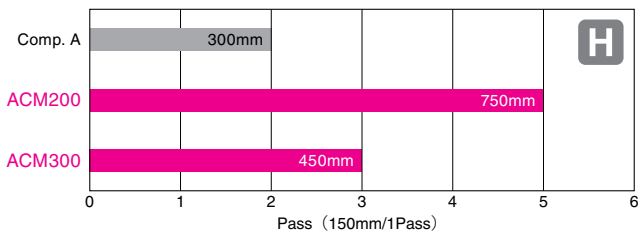
ACM200

Achieves excellent adhesion and chipping resistance thanks to the smoothness of CVD coating as well as our coating stress control technology.

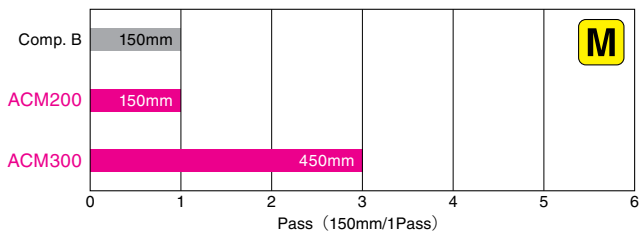
High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible by refining and hardening the coating layer.

Achieves over 2 times longer tool life compared to conventional grades under the same cutting conditions.

Performance

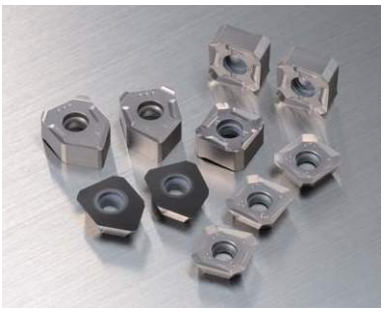


Work Material : SUH660 Tool : **WGX13100R (SEMT13T3AGSR-G)**
Cutting Conditions : v_c=**150**m/min, f_z =**0.15**mm/t, a_p=**1.0**mm, a_e=**60.0**mm, Wet



Work Material : SUS316L Tool : **WEX3032E (AXMT170508PEER-E)**
Cutting Conditions : v_c=**150**m/min, f_z =**0.15**mm/t, a_p=**2.0**mm, a_e=**20.0**mm, Wet

T4500A



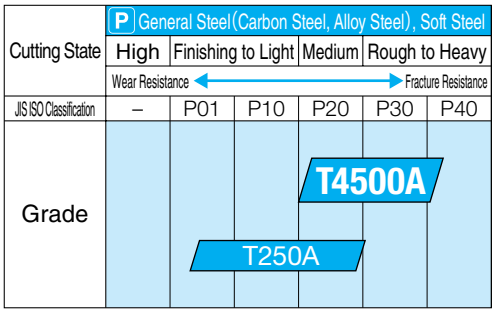
A general-purpose cermet grade that provides both wear and fracture resistance with higher-quality finished surfaces.

T4500A is an uncoated cermet grade for milling that puts emphasis on toughness and is suitable for copper machining.
T4500A enables stable finishing thanks to its excellent cutting edge strength and thermal shock resistance.

Characteristics

- Provides excellent cutting edge strength and fracture resistance.
- Achieves excellent thermal shock resistance and longer, stable tool life.
- Provides beautiful surface finish unique to cermet.

ApplicationRange



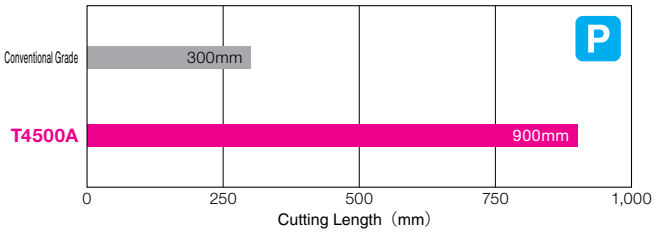
Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.
P	Soft Steel	≤180HB	150-**225**-300	0.10-**0.20**-0.30
	Alloy Steel	180 to 280HB	120-**185**-250	0.10-**0.20**-0.30
	Carbon Steel	180 to 280HB	120-**185**-250	0.10-**0.20**-0.30

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

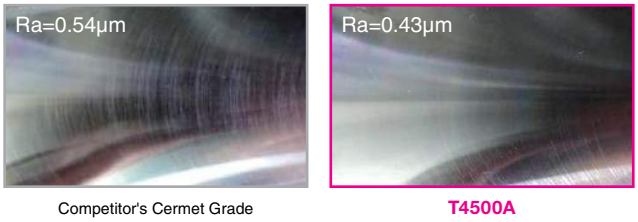
Performance

Fracture Resistance Comparison



Work Material : S50C Interrupted material Tool : **WFX12100R (SOMT120408PDER-G)**
Cutting Conditions : v_c=**200**m/min, f_z =**0.15**mm/t, a_p=**2.0**mm, a_e=**50.0**mm, Dry

Surface Finish Comparison



Competitor's Cermet Grade — T4500A

Work Material : S50C Tool : **WFX12100R (SOMT120408PDER-G)**
Cutting Conditions : v_c=**200**m/min, f_z =**0.15**mm/t, a_p=**2.0**mm, Center Cut, Dry

Cutter Identification Table

STANDARD TYPE

DGC (F) 13 100 R (S)

① (1) Cutter Series — Chart 1
② (2) Pitch — Chart 2
③ (3) Insert IC: Size Code — Chart 3
④ (4) Cutter Diameter — Chart 4
⑤ (5) Feed Direction — Chart 5
⑥ (6) Mounting — Chart 6

Chart 1: Cutter Series

Series Code
DGC
WGX
WGC
UFO
FPG
EHG
DNX
APG
WRCX
MSX
PWC
PWS
WFX
WEX
WRX

Chart 2: Pitch

Cutting Edge Pitch	
F	Extra-Fine
M	Fine

Chart 3: Insert IC: Size Code

Inch	IC Dimension (mm)
3	9.525
4	12.70
5	15.875
6	20.0
Millimetre	**IC Dimension (mm)**
12	12.7
13	13.5
14	14.0
16	16.0
20	20.0

Inscribed Circle (IC)

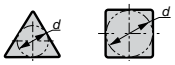


Chart 4: Cutter Diameter

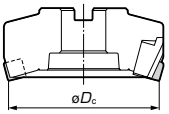


Chart 5: Feed Direction

Left Hand (L)	Right Hand (R)

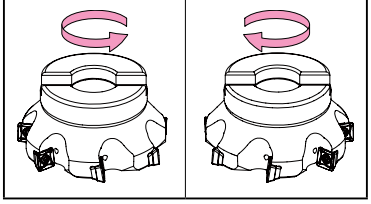


Chart 6: Mounting

Bore Size System	
S	Metric

HIGH FEED TYPE

DPV (Z) 4 100 (Q) R

① (1) Cutter Series
⑦ (7) 2 Piece Set Indication
③④⑧⑤ (3)(4)(5) Same as above
⑧ (8) Quick-change Indication

(1) Cutter Series
DPV
GRV
GSV
GFX
GFS
NRV
NFV
APV

(7) 2 Piece Set Indication
Z

(3)(4)(5)
Same as above

(8) Quick-change Indication
Q

Insert Identification Table

[Ex.] S E M T 13 T3 A G S N-H

① (1) Insert Shape — Chart 1
② (2) Relief Angle — Chart 2
③ (3) Tolerance — Chart 3
④ (4) Insert Hole of Breaker — Chart 4
⑤ (5) Cutting Edge Length — Chart 5
⑥ (6) Thickness — Chart 6
⑦ (7) Approach Angle — Chart 7
⑧ (8) Face Relief Angle — Chart 8
⑨ (9) Edge Treatment — Chart 9
⑩ (10) Feed Direction — Chart 10
⑪ (11) Supplementary Symbols — Chart 11

Chart 1: Insert Shape

Symbol	Insert Shape	Angle
A	Parallelogram	85°
H	Hexagonal	120°
L	Rectangular	90°
O	Octagonal	135°
P	Pentagonal	108°
R	Round	—
S	Square	90°
T	Triangle	60°
Q	Special	—
X	Special	—

Chart 2: Relief AngleShape

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

Chart 3: Tolerance (mm)

Symbol	Tolerance of Inscribed Circle (mm)	Thickness (mm)
A	±0.025	±0.025
C	±0.025	±0.025
E	±0.025	±0.025
K	±0.05 to ±0.15	±0.025
M	±0.05 to ±0.15	±0.13

Chart 4: Insert Hole or Breaker

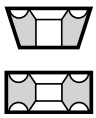
Symbol	Shape
W	
M	
R	
N	
T	

Chart5: Cutting Edge Length

Shape	Cutting Edge Length (ℓ)
S	
T	
R	
H	
A	
O	

Chart 6: Thickness

Symbol	Thickness (mm)
02	2.38
03	3.18
T3	3.97
04	4.76
06	6.35

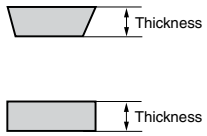


Chart 7: Approach Angle

Symbol	Approach Angle
A	45°
D	60°
E	75°
F	85°
H	87°
P	90°
Z	Special

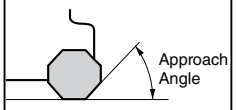


Chart 8: Face Relief Angle

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

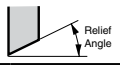


Chart 9: Edge Treatment

Symbol	Shape
F	 Sharp Edge
E	 Honed
T	 Negative Land
S	 Negative Land + Honed

Chart 10: Feed Direction

Symbol	Direction
N	None
R	Right Hand
L	Left Hand

Chart 11: Supplementary Symbols (Ex.)

Symbol	Description
A	Sharp Edge
H	Strong Edge
W	Large Edge Treatment
S	Main Insert for WBMR

* 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.

Explanation for the above exceptions:

- Although "H" and "K" indicate precision tolerances, the insert peripheral is not ground.
- "M" in this instance represents "Neutral Hand" insert.
- "T" in this instance represents "negative land" edge treatment.
- "R" indicates the feed direction (Right Hand).

WGX Type

Expansion

General Features

SEC-WaveMill WGX Type employs unique chipbreaker design to provide lower resistance and higher-quality surface finishes than conventional tools.
Lineup of chip grades and chipbreakers has been significantly expanded, and employment of the New ACM series enables machining of stainless steel and exotic alloys.

Characteristics

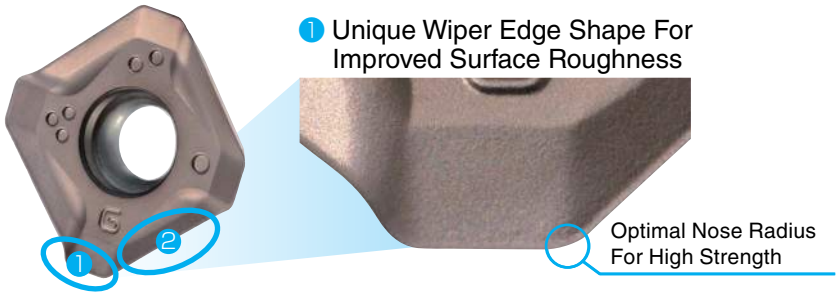
● Less cutting force
- The high-rake chipbreaker designed for use with the WGX type achieves low cutting resistance.

● High Quality
- Improved run-out precision and unique wiper edge shape ensure excellent surface finish quality.
- Addition of chamfer reduces burrs and edge chipping.

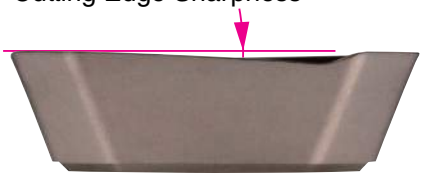
● New Grade Coating
- Features high-precision technology that reduces insert run-out variation and a new coating to provide stable and long tool life.
- The new New ACM200 and New ACM300 grades for exotic alloy machining further expand the range of applications.

Insert Shape Characteristics

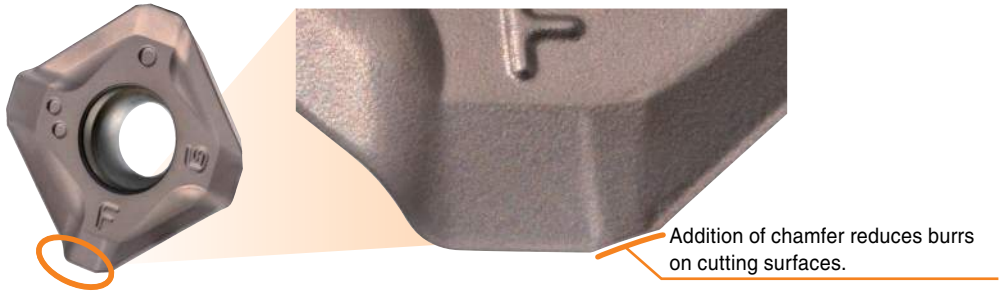
● General-purpose G Type Chipbreaker



2 Large Rake Angle And Cutting Edge Rake Angle Improves Cutting Edge Sharpness



● Low-Burr Design FG Type Chipbreaker



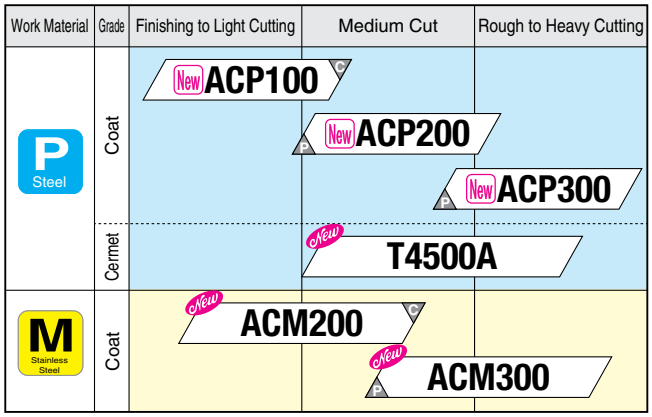
Series

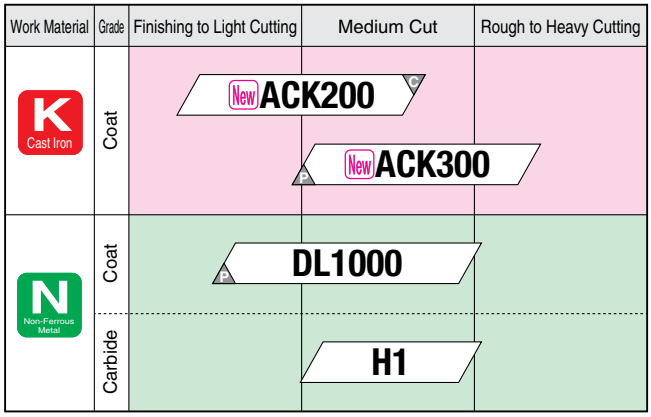
Type	Cat No.	Cutter	No. of Teeth	Cutter Mounting
Standard Pitch	WGX13000R(S)	ø40 to ø250	3 to 10	Imperial/Metric
Fine Pitch	WGXM13000R(S)	ø50 to ø250	4 to 14	Imperial/Metric
Extra-Fine Pitch	WGXF13000R(S)	ø50 to ø250	5 to 24	Imperial/Metric
Endmill Type	WGX13000EW	ø32 to ø63	3 to 5	Metric

Sizes of ϕ125mm and below have oil holes

WGX 13000R(S) Standard Pitch
WGXM 13000R(S) Fine Pitch
WGXF 13000R(S) Extra-Fine Pitch
WGX 13000EW Endmill Type

Application Range





The letters "C" and "P" at either end of each grade indicate coating type. C: CVD P: PVD Blank: Non-coated

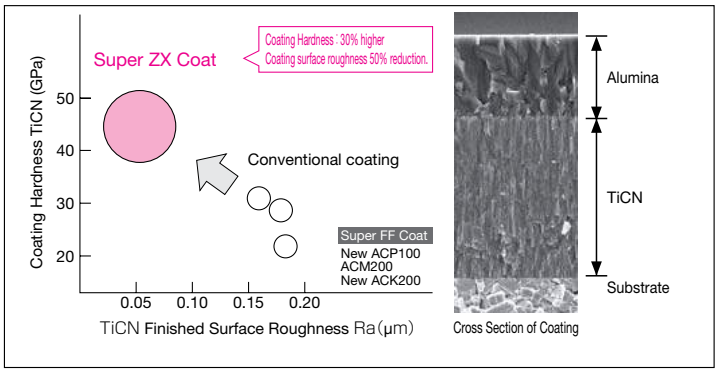
Features of Coating

C Super FF Coat (CVD : Chemical Vapor Deposition)

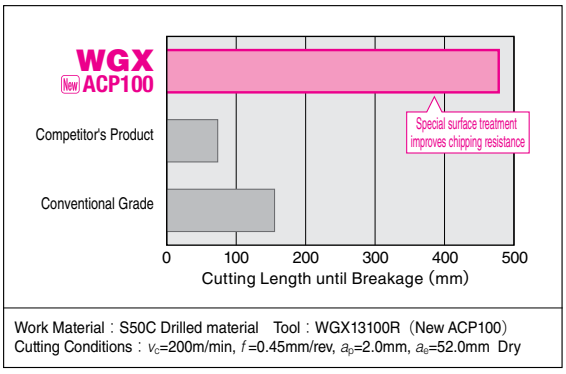
Provides excellent wear resistance and high reliability thanks to our coating stress control technology and the ultra-fine coating particles of the Super FF Coat achieved through our proprietary CVD process technology.

- ▶Achieves excellent chipping resistance thanks to the smoothness of the coating and our coating stress control technology.
- ▶High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible by hardening the coating layer.
- ▶Achieves over 2 times longer tool life compared to conventional grades under the same cutting conditions.

Characteristics of films



Fracture Resistance



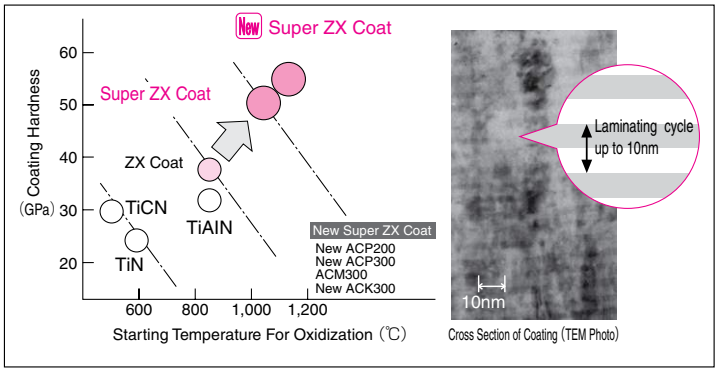
Work Material : S50C Drilled material Tool : WGX13100R (New ACP100)
Cutting Conditions : v_c=200m/min, f=0.45mm/rev, a_p=2.0mm, a_e=52.0mm Dry

P NEW Super ZX Coat/Super ZX Coat (PVD : Physical Vapor Deposition)

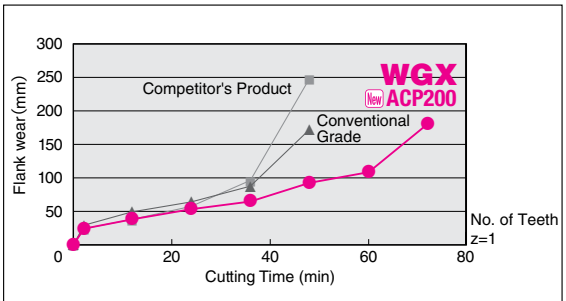
Employs our new Super ZX Coat, which utilizes our proprietary thin-layer coating technology and advanced nanotechnology. The coating consists of thousands of alternating, nanometer-level-thin (1 nanometer is 1 billionth of a meter) layers.

- ▶Compared to conventional grades, the coating hardness has been increased by 40% and the oxidization starting temperature has been increased by 200°C.
- ▶High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible.
- ▶Achieves over 2 times longer tool life compared to conventional grades under the same cutting conditions.

Characteristics of films



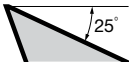
Wear Resistance



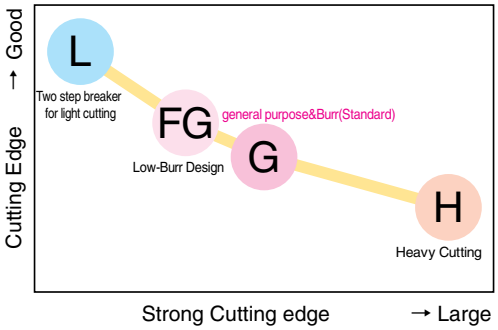
Equipment : M/C BT50 Work Material : S50C Tool : WGX13100R (New ACP200)
Cutting Conditions : v_c=200m/min, f_z=0.2mm/t, a_p=2.0mm, a_e=52.0mm Dry

WGX Type

Chipbreaker Selection

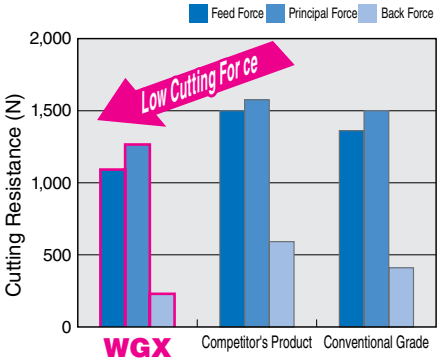
Work Material	P M K S N	P M K S	P K
Breaker	L	FG	G	H	W
Appearance					
Cutting Edge Insert Figure					
Characteristics	Low cutting force	Standard&Wiper flat	Standard	High Strength	Wiper
Application	Light Cutting	general purpose&Burr prevention	general purpose	Heavy Cut	Emphasis on Finishing Surface Roughness

Chipbreaker Map



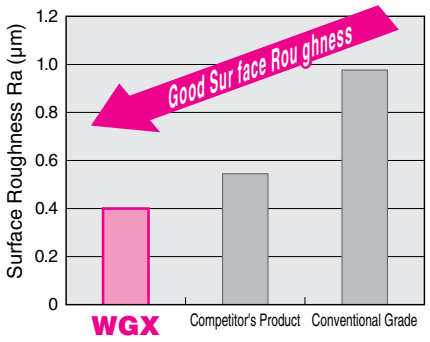
General-purpose G Type Chipbreaker

Cutting Resistance Comparison



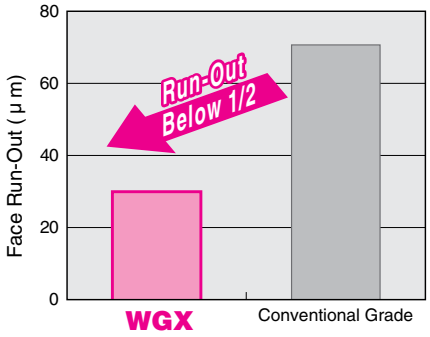
Work Material : S50C Tool : ø100
Cutting Conditions : v_c=200m/min, f_z=0.2mm/t, a_p=3.0mm

Finishing Surface Roughness Comparison



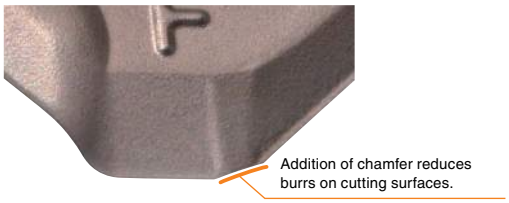
Work Material : S50C Tool : ø100
Cutting Conditions : v_c=200m/min, f_z=0.2mm/t, a_p=3.0mm

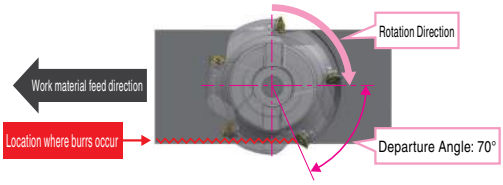
Run-Out at the Time of Insert Attachment



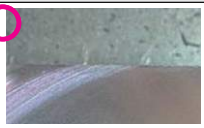
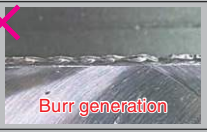
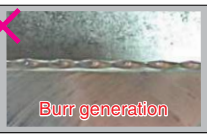
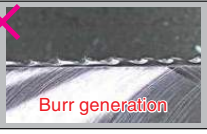
Tool : WGXM13100R (ø100)
7 Teeth

Low-Burr Design FG Type Chipbreaker





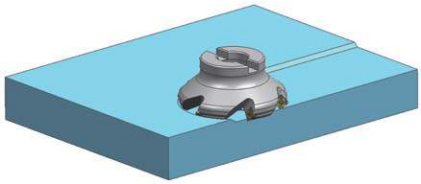
Cutting Surface Comparison

Work Material	FG Type	G Type	Conventional Grade	Competitor's Product
S50C	○ 	○ 	○ 	× 
SUS304	○ 	○ 	× 	× 
SCM440	○ 	× 	× 	× 

Machine : M/C BT50 Tool : WGX13100R (ø100) Grade : ACP200
Cutting Conditions : v_c=200m/min, f_z=0.2mm/t, a_p=3.0mm, a_e=80mm Dry

■ Application Examples

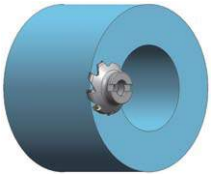
● SCM420 Block material

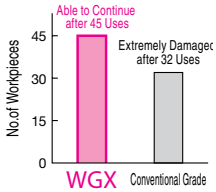


Surface roughness greatly improved compared to competitors' products.
Superior cutting edge and reduced cutting resistance. Stable cutting can be performed with a low load.

Tool : WGX13125R (ø125) Insert : SEMT13T3AGSR-G (ACP200)
Cutting Conditions : v_c=220m/min, f_z=0.25mm/t, a_p=2.0mm, a_e=125mm Dry

● ST-52 Pipe Steel

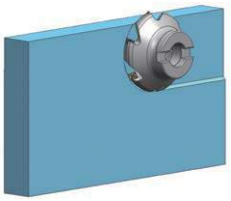




In contrast to conventional grades, which are heavily damaged after 32 uses per corner, WGX has little damage after 45 uses per corner and can continue cutting thereafter.

Tool : WGXM13125R (ø125) Insert : SEMT13T3AGSR-G (ACP200)
Cutting Conditions : v_c=300m/min, f_z=0.12mm/t, a_p=4.0mm, a_e=100mm Wet

● SS400 Machine Component



For low-rigidity machines, chattering occurred with conventional tools, but WGX reduces chattering. WGX also reduces the occurrence of exit burrs.

Tool : WGX13125R (ø125) Insert : SEMT13T3AGSR-FG (ACP200)
Cutting Conditions : v_c=200m/min, f_z=0.2mm/t, a_p=1.0mm, a_e=100mm Wet

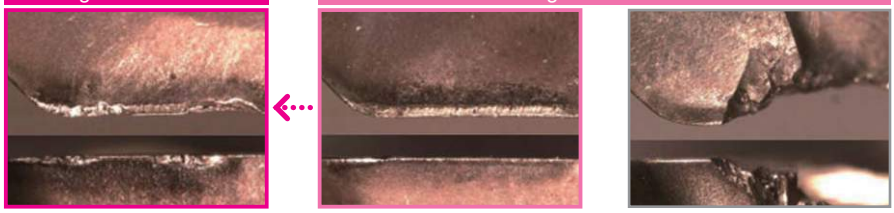
● SCM440 Machine Component

In heavy interrupted cutting of porous plates, WGX achieves a longer tool life with no breakages and a more favorable surface roughness than our competitors' products.

Tool : WGC13080R (ø80) Insert : SEMT13T3AGSR-H (ACP200)
Cutting Conditions : v_c=200m/min, f_z=0.15mm/t, a_p=3.0mm Dry

● SUS304 Machine Component

Cutting Distance : 8.25m | Cutting Distance : 3.75m



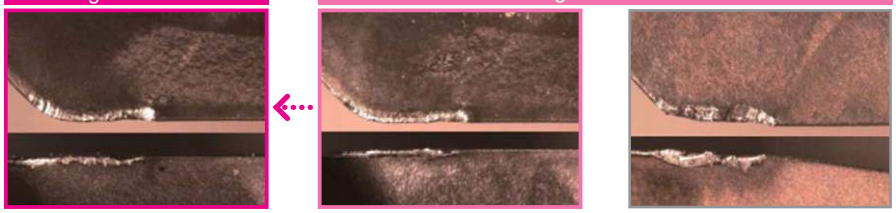
WGX WGX Competitor's Product

PVD coating, which has high hardness and excellent oxidation resistance, provides stable tool wear and a tool life that is over 2 times longer than that of our competitors.

Tool
Cutter : WGX13100RS (ø100)
Insert : SEMT13T3AGSR-G (ACM300)
Cutting Conditions : v_c= 150m/min
f_z = 0.15mm/t
a_p= 2.0mm
a_e= 20.0mm Dry

● SUS630/H900 Machine Component

Cutting Distance : 15m | Cutting Distance : 7.5m



WGX WGX Competitor's Product

The high wear resistance of CVD coating provides stable tool wear and a tool life that is over 2 times longer than that of our competitors.

Tool
Cutter : WGX13100RS (ø100)
Insert : SEMT13T3AGSR-G (ACM200)
Cutting Conditions : v_c= 150m/min
f_z = 0.1mm/t
a_p= 1.0mm
a_e= 75.0mm Dry

● S50C Machine Component

Stable cutting is achieved even with low-rigidity machines.

Cutting Resistance Comparison

	Cutting width a_e			
	10.0mm	20.0mm	30.0mm	40.0mm
WGX	○	○	○	○
Competitor's Product	○	○	Spindle stoppage	Spindle stoppage

Machine : M/C BT30
Tool : WGX13063RS (ø63) Insert : SEMT13T3AGSR-L (ACP200)
Cutting Conditions : v_c=300m/min, f_z=0.1mm/t, a_p=4.0mm Dry

WGX13000R(S) Type

Rake Angle		
	Radial	−20° to −24°
	Axial	20° to 22°

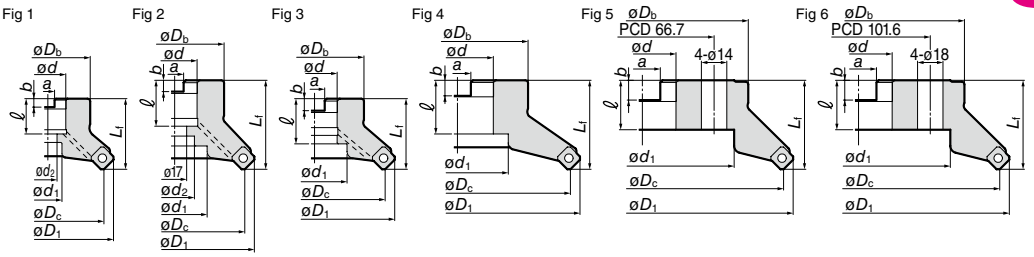
6mm 45°

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminum ◎ | S Exotic Alloy ○ | H Hardened Steel

General Milling for Steel & Hardened Steel & Cast Iron

Expansion

Fig 1 Fig 2 Fig 3 Fig 4 Fig 5 Fig 6



Body (Standard Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. 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	130	63	40	16.4	9.5	29	88	-	7	4.5	5
	13200RS	●	200	213	150	63	60	25.7	14	35	130	-	8	7.1	6
	13250RS	●	250	263	190	63	60	25.7	14	35	160	-	10	11.2	6
Imperial	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	150	63	47.625	25.4	14	35	130	-	8	7.1	6
	13250R	●	250	263	190	63	47.625	25.4	14	35	150	-	10	11.2	6

Inserts are not included. Check the collet attachment size (ød) when selecting the cutter. Sizes ø160 mm or above do not have coolant holes.

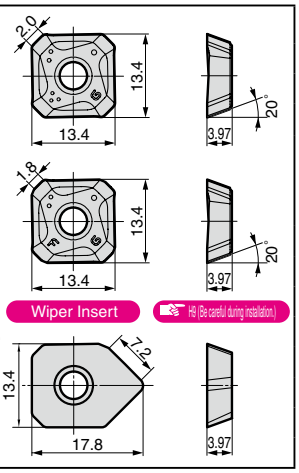
*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

Insert

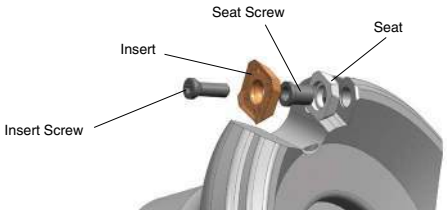
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Grade		Coat							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		MS		KN		N					
	General Purpose		PM	PM	K		MS	MS			N		P			
	Roughing		PM	PM		K		MS								
Cat. No.		ACP100 New	ACP200 New	ACP300 New	ACK200 New	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Application	Fig
SEET 13T3AGFR-L New									●		●				Light Cutting (Non-Ferrous Metal)	1
13T3AGSR-L New		●	●	●	●	●	●	●					●		Light Cutting	1
13T3AGSR-G New		●	●	●	●	●	●	●					●		general purpose	1
SEMT 13T3AGSR-L New		●	●	●	●	●	●	●							Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●							general purpose	1
13T3AGSR-H New		●	●	●	●	●	●	●							Heavy Cut	1
SEMT 13T3AGSR-FG		●	●	●	●	●	●	●							Burr prevention	2
XEEW 13T3AGER-WR New			●			●							●		Wiper Insert	3

Fig 1 Fig 2 Wiper Insert H6 (Be careful during installation.) Fig 3



* The new ACP100 and new ACK200 may vary in color or luster, but these variations do not affect the performance.



Identification Details

WGX 13 040 R S

(1) Cutter Series (2) Insert Size (3) Cutter (4) Direction (5) Metric Bore

Parts

Seat	Seat Screw	Insert Screw	Spanner (Insert)	Spanner (Seat)	Anti-seizure Cream
WGCS13R	BW0507F	BFTX03512IP N·m 3.0	TRDR15IP	LH035	SUMI-P

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.20**-0.30	ACP200
P	Soft Steel	≤180HB	180-**265**-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-**205**-250	0.15-**0.23**-0.30	ACM300
K	Cast Iron	250HB	100-**175**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	500-**750**-1000	0.15-**0.23**-0.30	DL1000
S	Exotic Alloy	—	30-**50**-80	0.10-**0.20**-0.30	ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

●mark: Standard stocked item (expanded item)

WGX13000R(S) Type

Rake Angle		
Radial	−20°to−24°	6mm 45°
Axial	20°to22°	

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminium ◎ | S Exotic Alloy ○ | H Hardened Steel

General Milling for Steel & Hardened Steel & Cast Iron

Expansion

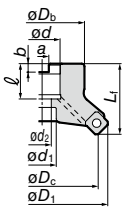
Fig 1 

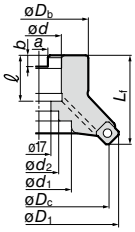
Fig 2 

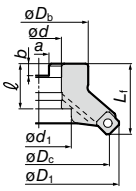
Fig 3 

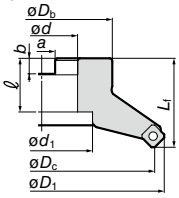
Fig 4 

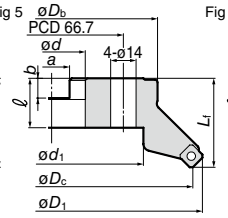
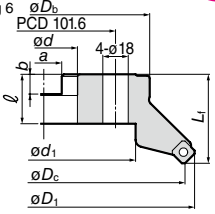
Fig 5 

Fig 6 

Body (Fine Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. 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	77	50	40	22	10.4	6.3	20	18	11	5	0.6	1
	13080RS	●	*80	94	55	50	27	12.4	7	25	20	13.5	6	1.1	1
	13100RS	●	100	114	70	50	32	14.4	8.5	32	46	-	7	1.6	3
	13125RS	●	125	139	80	63	40	16.4	9.5	29	52	29	8	2.8	1
	13160RS	●	160	174	130	63	40	16.4	9.5	29	88	-	10	4.5	5
	13200RS	●	200	214	150	63	60	25.7	14	35	130	-	12	7.0	6
	13250RS	●	250	264	190	63	60	25.7	14	35	160	-	14	11.1	6
Imperial	WGXM 13080R	●	*80	94	60	50	25.4	9.5	6	25	20	13	6	1.1	1
	13100R	●	*100	114	70	63	31.75	12.7	8	32.5	46	28	7	2.2	2
	13125R	●	125	139	80	63	38.1	15.9	10	35.5	55	30	8	2.9	1
	13160R	●	160	174	100	63	50.8	19.1	11	38	72	-	10	4.5	4
	13200R	●	200	214	150	63	47.625	25.4	14	35	130	-	12	7.0	6
	13250R	●	250	264	190	63	47.625	25.4	14	35	150	-	14	11.1	6

Inserts are not included. Check the collet attachment size (ød) when selecting the cutter. Sizes ø160 mm or above do not have coolant holes.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

Insert

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		M S		K N		N					
	General Purpose		P M	P M	K		M S	M S			N		P			
	Roughing		P M	P M		K		M S								
Cat. No.		ACP100 New	ACP200 New	ACP300 New	ACK200 New	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Application	Fig
SEET 13T3AGFR-L New									●		●				Light Cutting (Non-Ferrous Metal)	1
13T3AGSR-L New		●	●	●	●	●	●	●					●		Light Cutting	1
13T3AGSR-G New		●	●	●	●	●	●	●					●		general purpose	1
SEMT 13T3AGSR-L New		●	●	●	●	●	●	●							Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●							general purpose	1
13T3AGSR-H New		●	●	●	●	●	●	●							Heavy Cut	1
SEMT 13T3AGSR-FG		●	●	●	●	●	●	●							Burr prevention	2
XEEW 13T3AGER-WR New			●			●							●		Wiper Insert	3

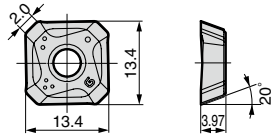
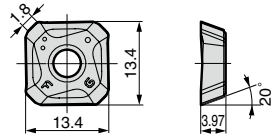
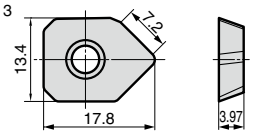
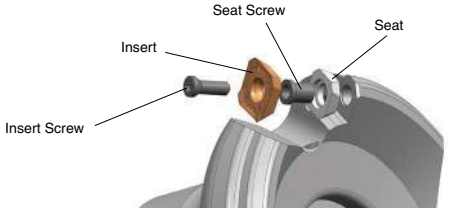
Fig 1 

Fig 2 

Wiper Insert H9 (Be careful during installation)

Fig 3 

* The new ACP100 and new ACK200 may vary in color or luster, but these variations do not affect the performance.



Identification Details

WGX (1) Cutter Series | M (2) M : Fine Pitched, F : Extra-Fine Pitched | 13 (3) Insert Size | 050 (4) Cutter | R (5) Direction | S (6) Metric Bore

Parts

Seat	Seat Screw	Insert Screw	Spanner (Insert)	Spanner (Seat)	Anti-seizure Cream
WGCS13R	BW0507F	BFTX03512IP (N·m) 3.0	TRDR15IP	LH035	SUMI-P

(N·m) Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.20**-0.30	ACP200
	Soft Steel	≤180HB	180-**265**-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-**205**-250	0.15-**0.23**-0.30	ACM300
K	Cast Iron	250HB	100-**175**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	500-**750**-1000	0.15-**0.23**-0.30	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

●mark: Standard stocked item (expanded item)

SEC-Wave Mill

WGXF13000R(S) Type

Rake Angle		
	Radial	−20°to−24°
	Axial	20° to 22°

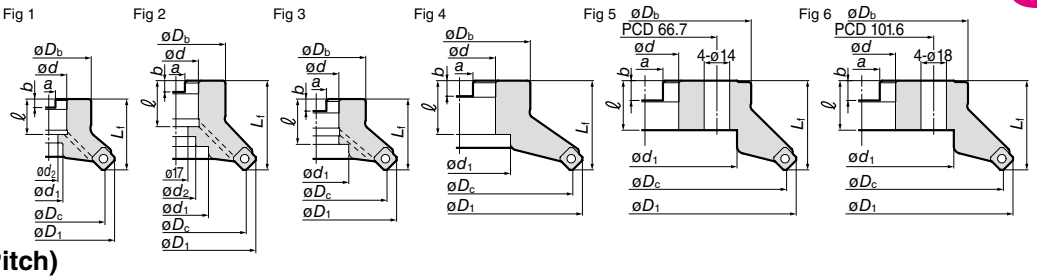
6mm 45°

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

General Milling for Steel & Hardened Steel & Cast Iron

Expansion

Fig 1 Fig 2 Fig 3 Fig 4 Fig 5 Fig 6



Body (Extra-Fine Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. 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	77	50	40	22	10.4	6.3	20	18	11	6	0.6	1
	13080RS	●	*80	94	55	50	27	12.4	7	25	20	13.5	8	1.1	1
	13100RS	●	100	114	70	50	32	14.4	8.5	32	46	-	10	1.5	3
	13125RS	●	125	139	80	63	40	16.4	9.5	29	52	29	12	2.7	1
	13160RS	●	160	174	130	63	40	16.4	9.5	29	88	-	16	4.5	5
	13200RS	●	200	214	150	63	60	25.7	14	35	130	-	20	6.9	6
	13250RS	●	250	264	190	63	60	25.7	14	35	160	-	24	11.0	6
Imperial	WGXF 13080R	●	*80	94	60	50	25.4	9.5	6	25	20	13	8	1.1	1
	13100R	●	*100	114	70	63	31.75	12.7	8	32.5	46	28	10	2.1	2
	13125R	●	125	139	80	63	38.1	15.9	10	35.5	55	30	12	2.8	1
	13160R	●	160	174	100	63	50.8	19.1	11	38	72	-	16	4.5	4
	13200R	●	200	214	150	63	47.625	25.4	14	35	130	-	20	6.9	6
	13250R	●	250	264	190	63	47.625	25.4	14	35	150	-	24	11.0	6

Inserts are not included. Check the collet attachment size (ød) when selecting the cutter. Sizes ø160 mm or above do not have coolant holes.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

Insert

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		MS		KN		N					
	General Purpose		PM	PM	K		MS	MS			N		P			
	Roughing		PM	PM		K		MS								
Cat. No.		ACP100 New	ACP200 New	ACP300 New	ACK200 New	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Application	Fig
SEET 13T3AGFR-L New									●		●				Light Cutting (Non-Ferrous Metal)	1
13T3AGSR-L New		●	●	●	●	●	●	●					●		Light Cutting	1
13T3AGSR-G New		●	●	●	●	●	●	●					●		general purpose	1
SEMT 13T3AGSR-L New		●	●	●	●	●	●	●							Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●							general purpose	1
13T3AGSR-H New		●	●	●	●	●	●	●							Heavy Cut	1
SEMT 13T3AGSR-FG		●	●	●	●	●	●	●							Burr prevention	2
XEEW 13T3AGER-WR New			●			●							●		Wiper Insert	3

Fig 1

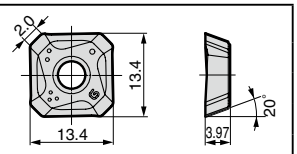
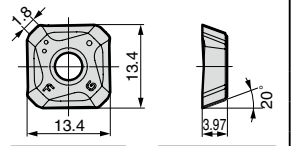


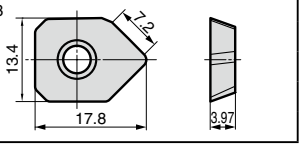
Fig 2



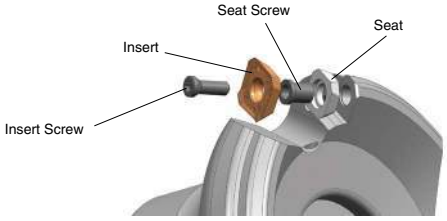
Wiper Insert

H9 (Be careful during installation)

Fig 3



* The new ACP100 and new ACK200 may vary in color or luster, but these variations do not affect the performance.



Identification Details

WGX F 13 050 R S

(1)	(2)	(3)	(4)	(5)	(6)
Cutter Series	M : Fine Pitched F : Extra-Fine Pitched	Insert Size	Cutter	Direction	Metric Bore

Parts

Seat	Seat Screw	Insert Screw	Spanner (Insert)	Spanner (Seat)	Anti-seizure Cream
WGCS13R	BW0507F	BFTX03512IP N·m 3.0	TRDR15IP	LH035	SUMI-P

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.20**-0.30	ACP200
P	Soft Steel	≤180HB	180-**265**-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-**205**-250	0.15-**0.23**-0.30	ACM300
K	Cast Iron	250HB	100-**175**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	500-**750**-1000	0.15-**0.23**-0.30	DL1000
S	Exotic Alloy	—	30- **50** -80	0.10-**0.20**-0.30	ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

●mark: Standard stocked item (expanded item)

WGX13000EW Type

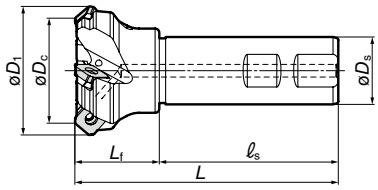
Rake Angle		
	Radial	−20°to−24°
	Axial	20°to22°

6mm 45°

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminium ◎ | S Exotic Alloy ○ | H Hardened Steel

General Milling for Steel & Hardened Steel & Cast Iron

Expansion



Body (Shank Type)

Cat. No.	Stock	Dimensions (mm)						No. of Teeth
		øDc	øD1	øDs	Lf	ℓs	L	
WGX 13032EW	●	32	44	32	40	85	125	3
13040EW	●	40	52	32	40	85	125	3
13050EW	●	50	62	32	40	85	125	4
13063EW	●	63	76	32	40	85	125	5

Inserts are not included. ϕ32 mm size does not have seats.

Insert

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

Grade		Coat							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		MS		KN		N				Application	Fig
	General Purpose		P		K		MS	MS			N		P			
	Roughing		P	P		K		MS								
Cat. No.		ACP100 New	ACP200 New	ACP300 New	ACK200 New	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A			
SEET 13T3AGFR-L New									●		●				Light Cutting (Non-Ferrous Metal)	1
13T3AGSR-L New		●	●	●	●	●	●	●					●		Light Cutting	1
13T3AGSR-G New		●	●	●	●	●	●	●					●		general purpose	1
SEMT 13T3AGSR-L New		●	●	●	●	●	●	●							Light Cutting	1
13T3AGSR-G		●	●	●	●	●	●	●							general purpose	1
13T3AGSR-H New		●	●	●	●	●	●	●							Heavy Cut	1
SEMT 13T3AGSR-FG		●	●	●	●	●	●	●							Burr prevention	2
XEEW 13T3AGER-WR New			●			●							●		Wiper Insert	3

Fig 1

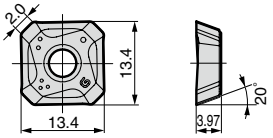
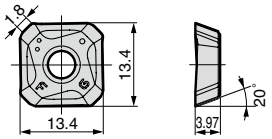


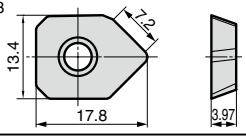
Fig 2



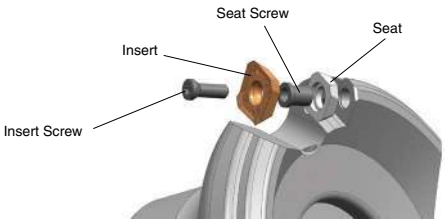
Wiper Insert

H9 (Be careful during installation.)

Fig 3



* The new ACP100 and new ACK200 may vary in color or luster, but these variations do not affect the performance.



Identification Details

WGX 13 032 EW

(1) Cutter Series | (2) Insert Size | (3) Cutter | (4) Endmill Type

Parts

Seat	Seat Screw	Insert Screw	Spanner (Insert)	Spanner (Seat)	Anti-seizure Cream
—	—	BFTX03512IP N·m 3.0	TRDR15IP	—	SUMI-P

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.20**-0.30	ACP200
P	Soft Steel	≤180HB	180-**265**-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-**205**-250	0.15-**0.23**-0.30	ACM300
K	Cast Iron	250HB	100-**175**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	500-**750**-1000	0.15-**0.23**-0.30	DL1000
S	Exotic Alloy	—	30-**50**-80	0.10-**0.20**-0.30	ACM300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

WGC3000/WGC(F)4000 Type

Rake Angle		(3000Type)	(4000Type)
	Radial	-10°to-19°	-20°to-24°
	Axial	+20°	+20°to 22°

4mm 45° (3000Type) 6mm 45° (4000Type)

P Steel ◎ M Stainless Steel ◎ K Cast Iron ◎ N Non-Ferrous Metal ◎ N Aluminum ◎ S Exotic Alloy ◎ H Hardened Steel

General Milling for Steel, Cast Iron & Exotic Material

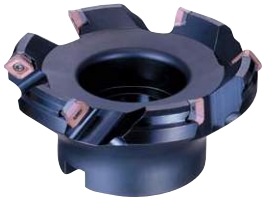


Fig 1

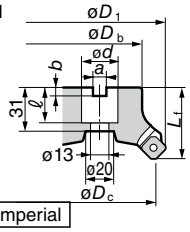


Fig 2

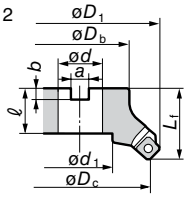
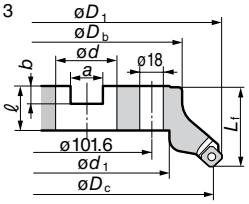


Fig 3



Inserts are not included.

■ Body (WGC 3000 Type)

Imperial

Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	ød1	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
WGC 3080R	●	*80	89	60	50	25.4	—	9.5	6	25	6	1.1	1
3100R	●	100	109	70	50	31.75	46	12.7	8	32	7	1.5	2

■ Body (WGC 4000 Type)

Imperial

WGC 4080R	●	*80	93	60	50	25.4	—	9.5	6	25	4	1.0	1
4100R	●	100	113	70	50	31.75	46	12.7	8	32	5	1.5	2
4125R	●	125	138	80	63	38.1	56	15.9	10	38	6	2.6	2
4160R	●	160	173	100	63	50.8	72	19.1	11	38	7	4.0	2
4200R	●	200	213	130	63	47.625	130	25.4	14	35	8	6.6	3

■ Body (WGCF 4000 Type)

Imperial

WGCF 4080R	●	*80	93	60	50	25.4	—	9.5	6	25	8	1.0	1
4100R	●	100	113	70	50	31.75	46	12.7	8	32	10	1.5	2
4125R	●	125	138	80	63	38.1	56	15.9	10	38	12	2.6	2
4160R	●	160	173	100	63	50.8	72	19.1	11	38	16	4.0	2
4200R	●	200	213	130	63	47.625	130	25.4	14	35	20	6.6	3

*Please use JIS B1176 hexagonal bolt (M12×30～35mm) for securing ø80/ø100 cutter to the arbour.

■ Insert

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

Grade		Coated Carbide					DLC	Carbide			Cermet	SUMIDIA			
Application	High Speed/Light	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	Application
SEET 0903AGFN-L		●	●	●	●	●	●			●		—	—	4	WGC 3000 Type
0903AGSN-G		●	●	●	●	●			●		●	—	—	4	
0903AGSN-N		●	●	●	●	●					●	—	—	4	
SEMT 0903AGSN-L		●	●	●	●	●						—	—	4	
0903AGSN-G		●	●	●	●	●		●				—	—	4	
SEET 13T3AGFN-L		●	●	●	●	●	●		●	●		—	—	5	WGC 4000 Type WGCF 4000 Type
13T3AGSN-G		●	●	●	●	●			●		●	—	—	5	
13T3AGSN-N		●	●	●	●	●		●			●	—	—	5	
SEMT 13T3AGSN-L		●	●	●	●	●						—	—	5	
13T3AGSN-G		●	●	●	●	●		●				—	—	5	
13T3AGSN-H		●	●	●	●	●						—	—	5	
NF-SECW 13T3AGTN-N		—	—	—	—	—	—	—	—	—	—	●	▲	5	
NF-XEEW 13T3AGFR-W		—	—	—	—	—	—	—	—	—	—	●	▲	6	
XEEW 13T3AGER-W						●					●	—	—	6	

Fig 4

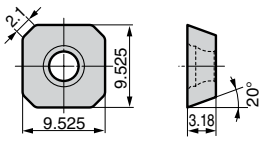
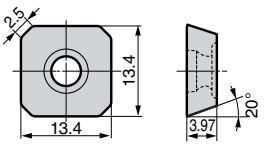
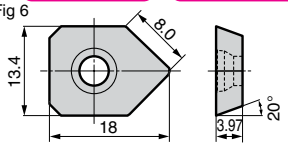


Fig 5

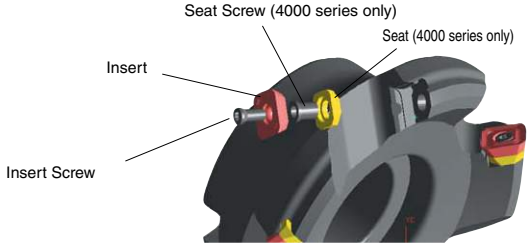


Wiper Insert — Hp (Be careful during installation.)

Fig 6



■ Parts



Applicable Cutters	Seat	Seat Screw	Insert Screw		Spanner (For Insert)	Spanner (For Seat)
WGC3000 Type	—	—	BFTX0307IP	N·m 2.0	TRDR10IP	—
WGC(F)4000 Type	WGCS13R	BW0507F	BFTX03512IP	N·m 3.0	TRDR15IP	LH035

* SUMI-P anti-seizure cream is included in the package.

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions WGC3000 Type

ISO	Work Material	Hardness	Cutting Speed v_c(m/min) Min.- **Optimum** -Max.	Feed Rate f_z(mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.15**-0.20	ACP200
	Soft Steel	≤180HB	180-**265**-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-**205**-250	0.15-**0.18**-0.20	ACP300
K	Cast Iron	250HB	100-**175**-250	0.15-**0.18**-0.20	ACK200
N	Non-Ferrous Alloy	—	500-**750**-1000	0.15-**0.23**-0.30	DL1000

■ Recommended Cutting Conditions WGC(F)4000 Type

ISO	Work Material	Hardness	Cutting Speed v_c(m/min) Min.- **Optimum** -Max.	Feed Rate f_z(mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.20**-0.30	ACP200
	Soft Steel	≤180HB	180-**265**-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-**205**-250	0.15-**0.23**-0.30	ACP300
K	Cast Iron	250HB	100-**175**-250	0.15-**0.23**-0.30	ACK200
N	Non-Ferrous Alloy	—	500-**750**-1000	0.15-**0.23**-0.30	DL1000

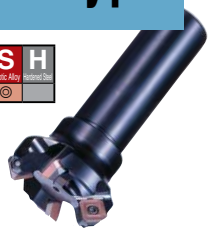
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

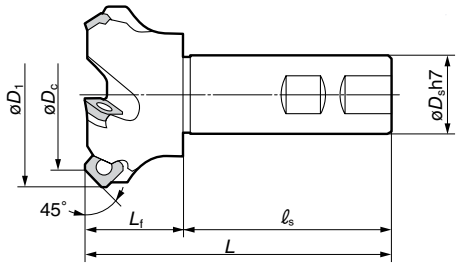
▲mark : To be replaced by new item (Please confirm stock availability)

SEC-Wave Mill

WGC3000EW/4000EW Type

4mm 45° (3000Type) 6mm 45° (4000Type) P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal N Aluminum S Exotic Alloy H Hardened Steel





Body (WGC 3000EW Type)

Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDs	Lf	ℓs	L	No. of Teeth
WGC 3020EW	●	20	29	20	40	60	100	2
3025EW	●	25	34	20	40	60	100	3
3032EW	●	32	41	32	40	85	125	4
3040EW	●	40	49	32	40	85	125	4
3050EW	●	50	59	32	40	85	125	5
WGC 3063EW	●	63	72	32	40	85	125	6

Body (WGC 4000EW Type)

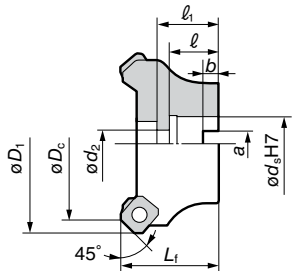
WGC 4032EW	●	32	44	32	40	85	125	3
4040EW	●	40	52	32	40	85	125	3
4050EW	●	50	62	32	40	85	125	4
4063EW	●	63	76	32	40	85	125	5

Inserts are not included.

SEC-Wave Mill

WGC3000RS/WGC(F)4000RS Type

4mm 45° (3000Type) 6mm 45° (4000Type) P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal N Aluminum S Exotic Alloy H Hardened Steel



Body (WGC 3000RS Type)

Metric

Cat. No.	Stock	Dimensions (mm) øDc	øD1	øds	ød2	b	a	Lf	ℓ	ℓ1	No. of Teeth
WGC 3032RS	●	32	41	16	9	5.6	8.4	40	18	28	4
3040RS	●	40	49	16	9	5.6	8.4	40	18	28	4
3050RS	●	50	59	22	11	6.3	10.4	40	20	26	5
3063RS	●	63	72	22	11	6.3	10.4	40	20	26	6

Body (WGC 4000RS Type)

Metric

WGC 4040RS	●	40	52	16	9	5.6	8.4	40	18	28	3
4050RS	●	50	63	22	11	6.3	10.4	40	20	26	3
4063RS	●	63	76	22	11	6.3	10.4	40	20	26	4

Body (WGCF 4000RS Type)

Metric

WGCF 4050RS	●	50	63	22	11	6.3	10.4	40	20	26	5
4063RS	●	63	76	22	11	6.3	10.4	40	20	26	6

Inserts are not included.

Insert

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

Grade		Coated Carbide					DLC	Carbide			Cermet	SUMIDIA			
Application	High Speed/Light	P			K		N			KN		N	N		
	General Purpose		PM	M	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	Application
SEET 0903AGFN-L		●	●	●	●	●	●			●		—	—	4	WGC 3000 Type
0903AGSN-G		●	●	●	●	●			●		●	—	—	4	
0903AGSN-N		●	●	●	●	●					●	—	—	4	
SEMT 0903AGSN-L		●	●	●	●	●						—	—	4	
0903AGSN-G		●	●	●	●	●		●				—	—	4	
SEET 13T3AGFN-L		●	●	●	●	●	●		●	●		—	—	5	WGC 4000 Type WGCF 4000 Type
13T3AGSN-G		●	●	●	●	●			●		●	—	—	5	
13T3AGSN-N		●	●	●	●	●		●			●	—	—	5	
SEMT 13T3AGSN-L		●	●	●	●	●						—	—	5	
13T3AGSN-G		●	●	●	●	●		●				—	—	5	
13T3AGSN-H		●	●	●	●	●						—	—	5	
NF-SECW 13T3AGTN-N		—	—	—	—	—	—	—	—	—	—	●	▲	5	
NF-XEEW 13T3AGFR-W		—	—	—	—	—	—	—	—	—	—	●	▲	6	
XEEW 13T3AGER-W						●					●	—	—	6	

Fig 4

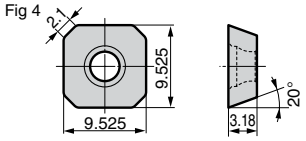
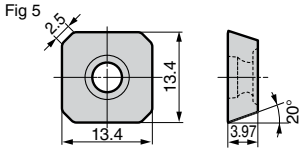
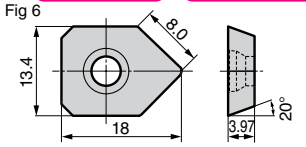


Fig 5



Wiper Insert H9 (Be careful during installation.)

Fig 6



Spare Parts

Seat	Seat Screw	Insert Screw		Spanner (For Insert)	Spanner (For Seat)	Applicable Endmill
—	—	BFTX0307IP	N·m 2.0	TRDR10IP	—	WGC 3000EW/RS Type
—	—	BFTX03512IP	N·m 3.0	TRDR15IP	—	WGC 4032EW
WGCS13R	BW0507F	BFTX03512IP	N·m 3.0	TRDR15IP	LH035	WGC 4000EW / RS Type (Except WGC 4032EW) WGCF 4000RS Type

* SUMI-P anti-seizure cream is included in the package.

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions WGC3000EW/RS Type (Common)

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.15**-0.20	ACP200
	Soft 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**-1000	0.15-**0.18**-0.20	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

Recommended Cutting Conditions WGC4000EW/RS·WGCF4000RS Type (Common)

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.20**-0.30	ACP200
	Soft 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**-1000	0.15-**0.18**-0.20	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

▲mark : To be replaced by new item (Please confirm stock availability)

DGC Type

Expansion

General Features

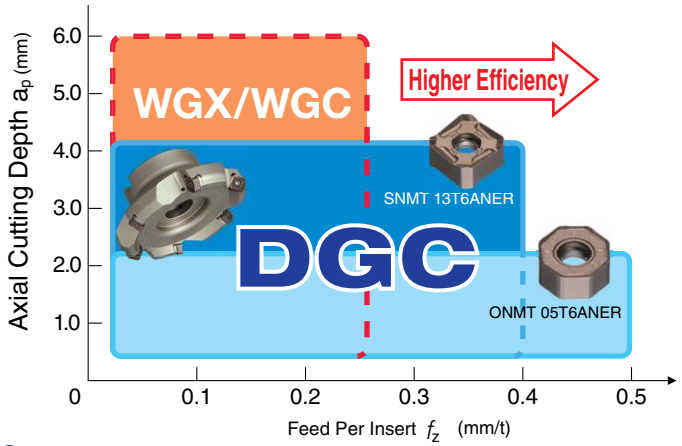
SEC-Sumi Dual Mill DGC type employs double-sided inserts with up to 16 corners for excellent economy. This is a general-purpose cutter featuring high cutting edge strength for high efficiency milling and a low-burr chipbreaker design that provides high quality machined surfaces.

DGC type insert line up includes double-sided SNMT and ONMT types.
Up to 16 corners can be used for improved economy.

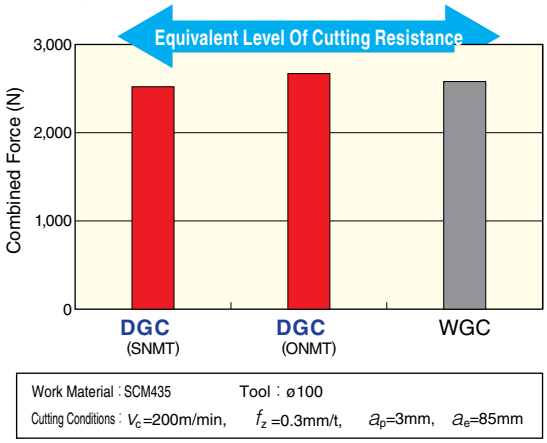
Characteristics

● Achieves level of cutting edge sharpness and machined surface quality equivalent to single-sided insert cutter at a maximum cutting depth of a_p=3mm or shallower.

●Recommended Cutting Conditions For General Steel Milling

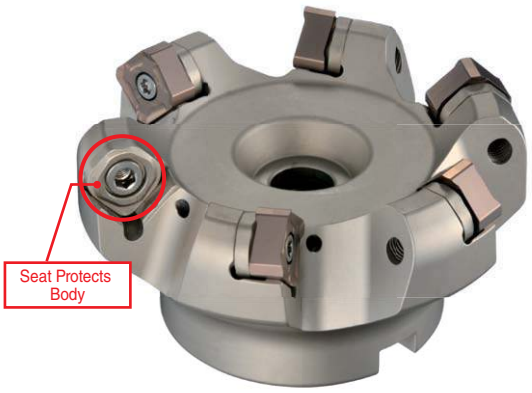


●Cutting Resistance Comparison



● **Dual-Purpose Body Characteristics**

Two types of inserts can be used with a single body depending on milling application to help reduce tool costs.

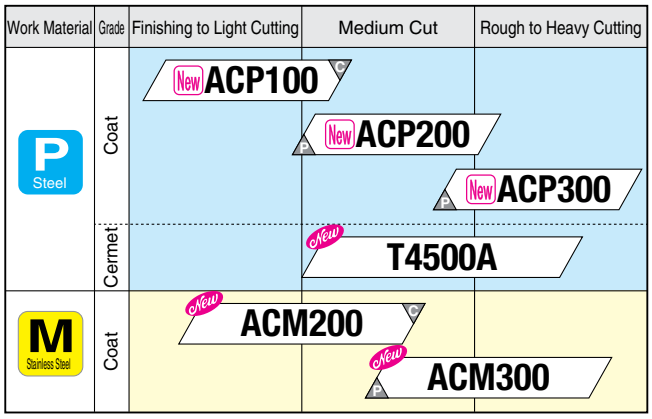


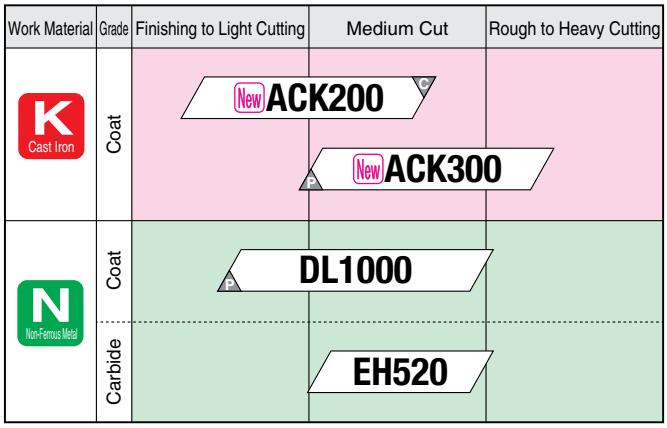
Use Two Types Of Insert For Different Applications

● **Choose A Tool To Suit Your Application From A Comprehensive Lineup**

DGC 13000R(S) Standard Pitch	DGCM 13000R(S) Fine Pitch	DGCF 13000R(S) Extra-Fine Pitch	DGC 13000EW Endmill Type
Cutter : φ40mm to φ250mm	Cutter : φ50mm to φ250mm	Cutter : φ50mm to φ250mm	Cutter : φ40mm to φ63mm
Cutting Edges : 3 to 10	Cutting Edges : 4 to 14	Cutting Edges : 5 to 18	Cutting Edges : 3 to 4
Mounting: Metric/Imperial	Mounting: Metric/Imperial	Mounting: Metric/Imperial	Mounting: Metric/Imperial

Application Range





The letters "C" and "P" at either end of each grade indicate coating type. C: CVD P: PVD Blank: Non-coated

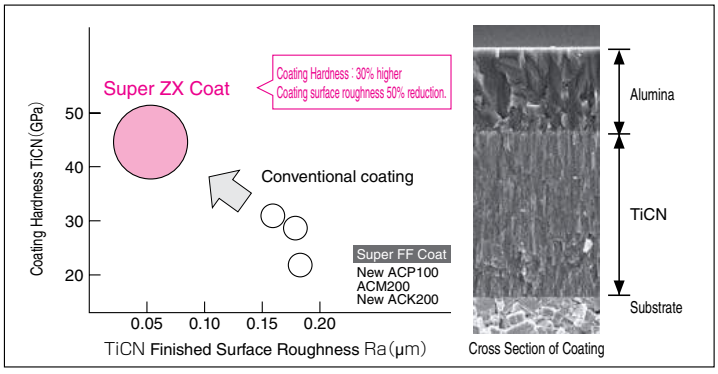
Features of Coating

Super ZX Coat (CVD : Chemical Vapor Deposition)

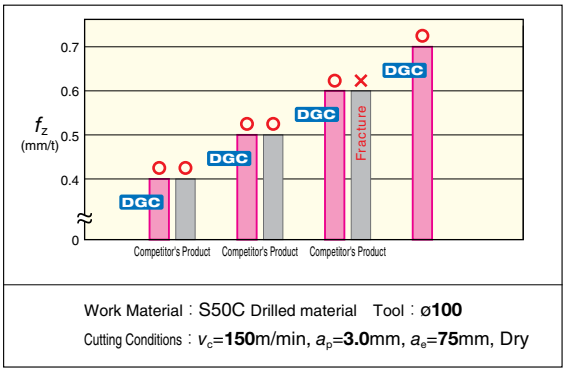
Provides excellent wear resistance and high reliability thanks to our coating stress control technology and the ultra-fine coating particles of the Super FF Coat achieved through our proprietary CVD process technology.

- ▶Achieves excellent chipping resistance thanks to the smoothness of the coating and our coating stress control technology.
- ▶High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible by hardening the coating layer.
- ▶Achieves over 2 times longer tool life compared to conventional grades under the same cutting conditions.

Characteristics of films



Fracture Resistance



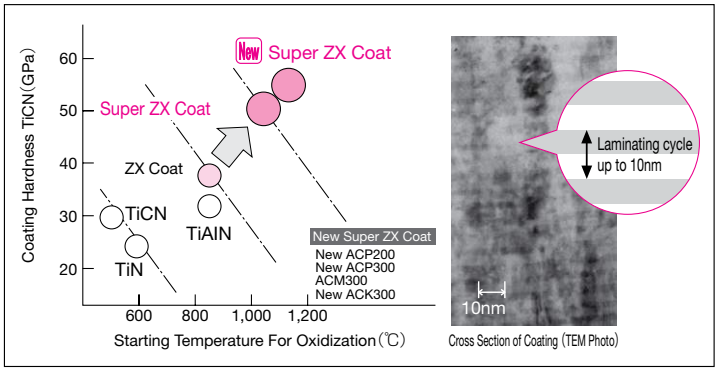
Work Material : S50C Drilled material Tool : ø100
Cutting Conditions : v_c=150m/min, a_p=3.0mm, a_e=75mm, Dry

NEW Super ZX Coat/Super ZX Coat (PVD : Physical Vapor Deposition)

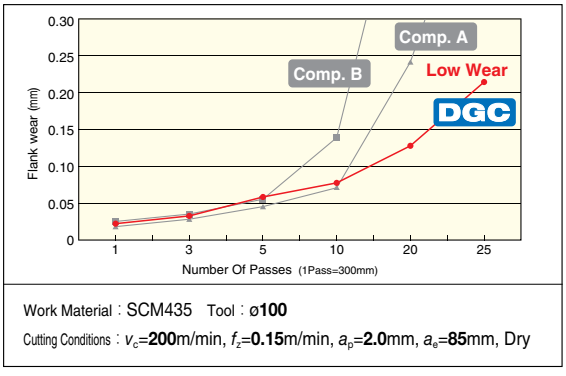
Employs our new Super ZX Coat, which utilizes our proprietary thin-layer coating technology and advanced nanotechnology. The coating consists of thousands of alternating, nanometer-level-thin (1 nanometer is 1 billionth of a meter) layers.

- ▶Achieves excellent chipping resistance thanks to the smoothness of the coating and our coating stress control technology.
- ▶High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible by hardening the coating layer.
- ▶Achieves over 2 times longer tool life compared to conventional grades under the same cutting conditions.

Characteristics of films



Wear Resistance

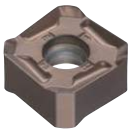
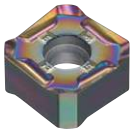
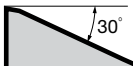
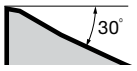
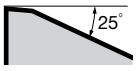
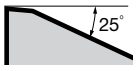
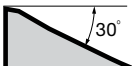
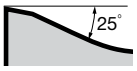
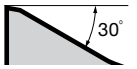
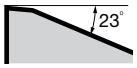


Work Material : SCM435 Tool : ø100
Cutting Conditions : v_c=200m/min, f_z=0.15m/min, a_p=2.0mm, a_e=85mm, Dry

DGC Type

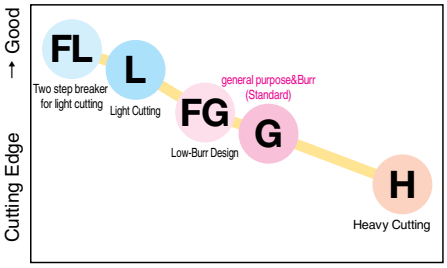
Expansion

Chipbreaker Selection

Work Material	P M K S					N	P K
Breaker	FL	L	FG	G	H	S	W
Appearance							
Cutting Edge Insert Figure	 30°	 30°	 25°	 25°	 25°	 30°	 25°
4 / 8	Not Available	 30°	Not Available	 23°	Not Available	Not Available	Double-Sided, 2 Corners (*)
Characteristics	Light Cutting&Wiper flat	Light Cutting	Standard&Wiper flat	Standard	High Strength	High Rake	Wiper
Application	Low cutting force&Burr prevention	Low cutting force	general purpose&Burr prevention	general purpose	Heavy Cut	Non-Ferrous Metal	Emphasis on Finishing Surface Roughness

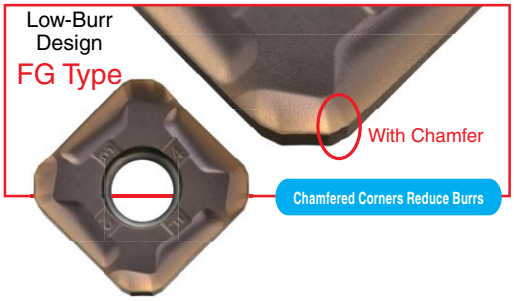
* Can be used only in combination with square inserts.

Chipbreaker Map

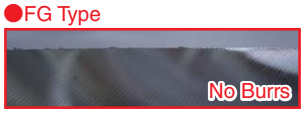


Improved Milling Quality

· FG type chipbreakers feature chamfer to minimize burrs and provide excellent milling quality.

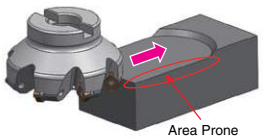


●FG Type



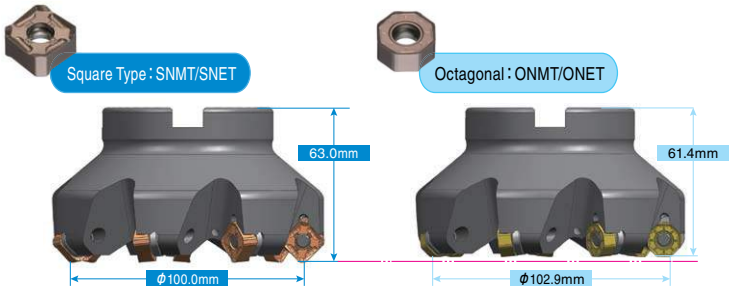
●Comp. A

FG type inserts with low-burr design enable high-quality milling with few burrs and little edge chipping.



Work Material : SCM435
Tool : φ100
Cutting Conditions : V_c=200m/min, f_z=0.2mm/t
a_p=3mm, a_e=85mm

Cutter Diameter And Cutting Edge Height

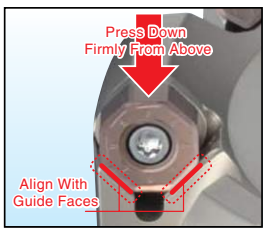


Note that while square inserts (SNMT) and octagonal inserts (ONMT) can be used interchangeably on the same body, they have different cutter diameters, cutting edge heights, and maximum cutting depths.

Body Shape (Example: With Cutter Diameter of 100mm)

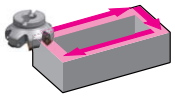
Insert	Cutter ϕD_c (mm)	Cutting Edge Height L_f (mm)	Max. Depth of Cut a_p (mm)
SNMT/SNET	100.0	63.0	6.0
ONMT/ONET	102.9	61.4	3.0

Attaching Octagonal Inserts



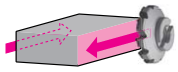
Firmly align insert with guide faces, press down in the direction of the arrow, and tighten the screw to fix the insert.

■ Application Examples



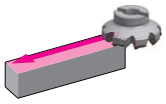
Part/Work Material		Automotive Component/Cast Steel	
Tool	Manufacturer	Sumitomo	Conventional Tool
	Body	DGCM13080R(ϕ80)	ϕ80
	Insert	SNMT13T6ANER-G (8 Corners)	Single-Sided (4 Corners)
	No. of Flutes	6	6
	Grade	ACP200	PVD Positive Type
Cutting Conditions	Cutting Speed(m/min)	160	160
	Feed (mm/t)	0.31	0.31
	Feed Rate (mm/min)	1,184	1,184
	Axial Cutting Depth(mm)	3	3
	Cutting Width(mm)	60	60
	No.of Workpieces	2	2
	Dry/Wet	Wet	Wet

Can be used under the same conditions as the single-sided inserts. Improves tool economy by doubling corners.



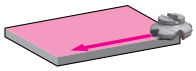
Part/Work Material		Machine Component/S50C	
Tool	Manufacturer	Sumitomo	Conventional Tool
	Body	DGCM13160R(ϕ160)	ϕ160
	Insert	SNMT13T6ANER-FG (8 Corners)	Single-Sided (8 Corners)
	No. of Flutes	10	10
	Grade	ACP200	PVD Positive Type
Cutting Conditions	Cutting Speed(m/min)	133	133
	Feed (mm/t)	0.132	0.132
	Feed Rate (mm/min)	350	350
	Axial Cutting Depth(mm)	2.5	2.5
	Cutting Time	287分	287分
	Dry/Wet	Dry	Dry

Reduces more burrs and achieves higher milling quality compared to conventional grades.



Part/Work Material		Machine Component/Cast Steel	
Tool	Manufacturer	Sumitomo	Conventional Tool
	Body	DGCM13125(ϕ125)	ϕ125
	Insert	ONMT05T6ANER-G (16 Corners)	Double-Sided (8 Corners)
	No. of Flutes	8	8
	Grade	ACP200	PVD Positive Type
Cutting Conditions	Cutting Speed(m/min)	160	160
	Feed (mm/t)	0.29	0.29
	Feed Rate (mm/min)	945	945
	Cutting Width(mm)	2.5	2.5
	Dry/Wet	Dry	Dry

Improves tool economy by doubling corners.



Part/Work Material		Automotive Component/Stainless Steel	
Tool	Manufacturer	Sumitomo	Conventional Tool
	Body	DGC13100R(ϕ100)	ϕ100
	Insert	SNET13T6ANER-G (8 Corners)	Single-Sided (4 Corners)
	No. of Flutes	5	5
	Grade	ACM300	PVD Positive Type
Cutting Conditions	Cutting Speed(m/min)	150	150
	Feed (mm/t)	0.15	0.15
	Feed Rate (mm/min)	360	360
	Axial Cutting Depth(mm)	2.0	2.0
	Dry/Wet	Wet	Wet

Doubles corners and provides over 3 times longer tool life per corner compared to conventional grades.

■ Recommended Cutting Conditions (SNMT/SNET)

ISO	Work Material	Hardness	Cutting Speed v_c(m/min) Min.-Optimum-Max.	Feed Rate f_z(mm/t) Min.-Optimum-Max.	Depth of Cut (mm)	Grade
P	General Steel	G	150-200-250	0.10-0.25-0.40	<4	ACP200 ACP300
P	Soft Steel	G	180-250-350	0.10-0.30-0.45	<4	ACP200 ACP300
P	Die Steel	G	100-150-200	0.15-0.25-0.35	<4	ACP200 ACP300
M	Stainless Steel	G	160-200-250	0.15-0.23-0.30	<3	ACM300
K	Cast Iron	G	100-200-250	0.10-0.25-0.40	<5	ACK200 ACK300
N	Non-Ferrous Metal	G	650-700-750	0.10-0.15-0.20	<3	DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

■ Recommended Cutting Conditions (ONMT/ONET)

ISO	Work Material	Hardness	Cutting Speed v_c(m/min) Min.-Optimum-Max.	Feed Rate f_z(mm/t) Min.-Optimum-Max.	Depth of Cut (mm)	Grade
P	General Steel	G	150-200-250	0.10-0.30-0.50	<2	ACP200 ACP300
P	Soft Steel	G	180-250-350	0.10-0.50-0.50	<2	ACP200 ACP300
P	Die Steel	G	100-150-200	0.15-0.25-0.30	<2	ACP200 ACP300
M	Stainless Steel	G	160-200-250	0.15-0.23-0.30	<2	ACM300
K	Cast Iron	G	100-200-250	0.10-0.30-0.50	<2	ACK200 ACK300

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

DGC13000R(S) Type

Rake Angle		
	Radial	−10°
	Axial	−5°

6mm 45° (SNMT/SNET) 3mm 45° (ONMT/ONET)

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminum ◎ | S Exotic Alloy | H Hardened Steel

General Milling for Steel & Hardened Steel & Cast Iron

Expansion

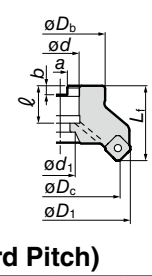
Fig 1


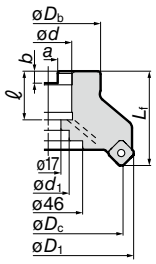
Fig 2


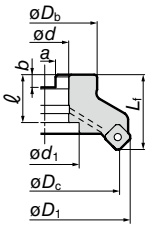
Fig 3


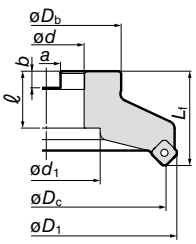
Fig 4


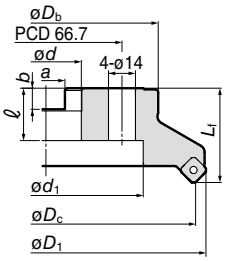
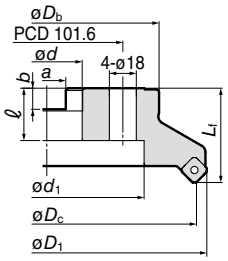
Fig 5


Fig 6


Body (Standard Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	ød1	No. of Teeth	Weight (kg)	Fig
Metric	DGC 13040RS	●	40 (42.9)	54	36	40 (38.44)	16	8.4	5.6	18	13.5	3	0.3	1
	13050RS	●	50 (52.9)	64	40	40 (38.44)	22	10.4	6.3	20	18	3	0.4	1
	13063RS	●	63 (65.9)	77	50	40 (38.44)	22	10.4	6.3	20	18	4	0.5	1
	13080RS	●	*80 (82.9)	94	60	50 (48.44)	27	12.4	7	25	20	4	1.2	1
	13100RS	●	100 (102.9)	114	70	50 (48.44)	32	14.4	8.5	32	46	5	1.6	3
	13125RS	●	125 (127.9)	139	80	63 (61.44)	40	16.4	9.5	29	52	6	2.8	1
	13160RS	●	160 (162.9)	174	130	63 (61.44)	40	16.4	9.5	29	88	7	4.5	5
	13200RS	●	200 (202.9)	214	150	63 (61.44)	60	25.7	14	35	130	8	7.1	6
	13250RS	●	250 (252.9)	264	190	63 (61.44)	60	25.7	14	35	160	10	11.2	6
Imperial	DGC 13080R	●	*80 (82.9)	94	60	50 (48.44)	25.4	9.5	6	25	20	4	1.2	1
	13100R	●	*100 (102.9)	114	70	63 (61.44)	31.75	12.7	8	32.5	28	5	2.2	2
	13125R	●	125 (127.9)	139	80	63 (61.44)	38.1	15.9	10	35.5	55	6	2.8	1
	13160R	●	160 (162.9)	174	100	63 (61.44)	50.8	19.1	11	38	72	7	4.5	4
	13200R	●	200 (202.9)	214	150	63 (61.44)	47.625	25.4	14	35	130	8	7.1	6
	13250R	●	250 (252.9)	264	190	63 (61.44)	47.625	25.4	14	35	150	10	11.2	6

Figures in parentheses indicate values for ONMT/ONET type inserts.

Inserts are not included. Sizes ø160 mm or above do not have coolant holes. Figures in parentheses indicate values for ONMT type inserts.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

Inserts

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

Grade		Coated Carbide							Carbide		DLC		Cermet		
Application	High Speed/Light	P			K		M S		K N		N		P M		
	General Purpose		P M	P M	K		M S			K S	N		P		
	Roughing		P M	P M		K		M S							
Cat. No.		ACP100 New	ACP200 New	ACP300 New	ACK200 New	ACK300 New	ACM200 New	ACM300 New	H1	EH520	DL1000		T4500A		Fig
SNMT	13T6ANER-L	●	●	●	●	●									1
	13T6ANER-G	●	●	●	●	●				●			●		1
	13T6ANER-H	●	●	●	●	●									1
	13T6ANER-FL	●	●	●	●	●									2
	13T6ANER-FG	●	●	●	●	●									2
SNET	13T6ANER-L New						●	●							1
	13T6ANER-G New						●	●							1
	13T6ANER-FL New						●	●							2
	13T6ANER-FG New						●	●							2
	13T6ANFR-S New								●		●				1
XNEU	13T6ANEN-W		●			●							●		3
ONMT	05T6ANER-L	●	●	●	●	●									4
	05T6ANER-G	●	●	●	●	●									4
ONET	05T6ANER-L New						●	●							4
	05T6ANER-G New						●	●							4

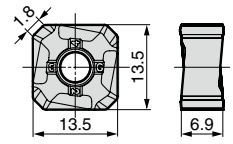
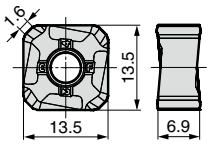
Fig 1


Fig 2


Wiper Insert

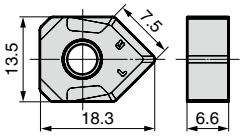
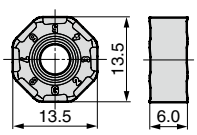
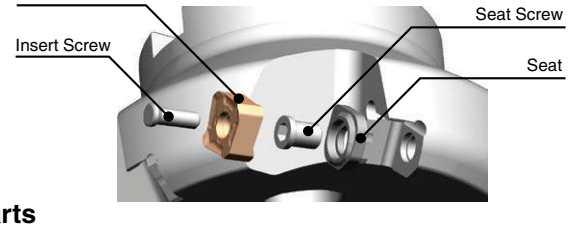
Fig 3


Fig 4


Wiper inserts can be used only in combination with square inserts.

* The new ACP100 and new ACK200 may vary in color or luster, but these variations do not affect the performance.



Identification Details

DGC 13 040 R S

(1) Cutter Series (2) Insert Size (3) Cutter (4) Direction (5) Metric Bore

(Optional)

Insert Screw(*)

BFTX0418IP

Recommended Cutting Conditions

H31

Parts

Seat	Seat Screw	L Type Wrench	Insert Screw		Spanner	Anti-seizure Cream
DGCS13R	BW06509F	LH040	BFTX0412IP	N·m 3.0	TRDR15IP	SUMI-P

N·m Recommended Tightening Torque (N·m)

*Corners can be changed simply by loosening the screw. (Only applies to DGC / DGCM types with body size ϕ80 or above.

●mark: Standard stocked item (expanded item)

DGCM13000R(S) Type

Rake Angle		
	Radial	−10°
	Axial	−5°

6mm 45° (SNMT/SNET) 3mm 45° (ONMT/ONET)

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

General Milling for Steel & Cast Iron

Expansion

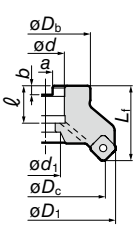
Fig 1


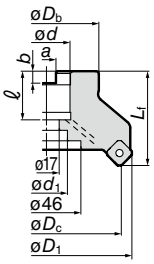
Fig 2


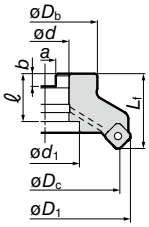
Fig 3


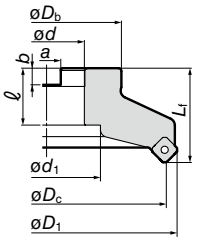
Fig 4


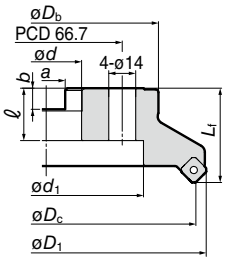
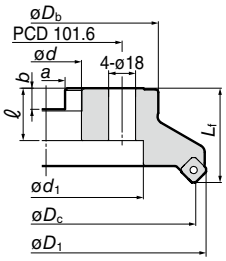
Fig 5


Fig 6


■ Body (Standard Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	ød1	No. of Teeth	Weight (kg)	Fig
Metric	DGCM 13050RS	●	50 (52.9)	64	40	40 (38.44)	22	10.4	6.3	20	18	4	0.3	1
	13063RS	●	63 (65.9)	77	50	40 (38.44)	22	10.4	6.3	20	18	5	0.5	1
	13080RS	●	*80 (82.9)	94	60	50 (48.44)	27	12.4	7	25	20	6	1.1	1
	13100RS	●	100 (102.9)	114	70	50 (48.44)	32	14.4	8.5	32	46	7	1.5	3
	13125RS	●	125 (127.9)	139	80	63 (61.44)	40	16.4	9.5	29	52	8	2.8	1
	13160RS	●	160 (162.9)	174	130	63 (61.44)	40	16.4	9.5	29	88	10	4.6	5
	13200RS	●	200 (202.9)	214	150	63 (61.44)	60	25.7	14	35	130	12	7	6
	13250RS	●	250 (252.9)	264	190	63 (61.44)	60	25.7	14	35	160	14	11.1	6
Imperial	DGCM 13080R	●	*80 (82.9)	94	60	50 (48.44)	25.4	9.5	6	25	20	6	1.1	1
	13100R	●	*100 (102.9)	114	70	63 (61.44)	31.75	12.7	8	32.5	28	7	2.2	2
	13125R	●	125 (127.9)	139	80	63 (61.44)	38.1	15.9	10	35.5	55	8	2.8	1
	13160R	●	160 (162.9)	174	100	63 (61.44)	50.8	19.1	11	38	72	10	4.6	4
	13200R	●	200 (202.9)	214	150	63 (61.44)	47.625	25.4	14	35	130	12	7	6
	13250R	●	250 (252.9)	264	190	63 (61.44)	47.625	25.4	14	35	150	14	11.1	6

Inserts are not included. Sizes ø160 mm or above do not have coolant holes. Figures in parentheses indicate values for ONMT type inserts.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

■ Inserts

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

Grade		Coated Carbide							Carbide		DLC		SUMIDIA		
Application	High Speed/Light	P			K		M		K		N		PM		
	General Purpose		PM	PM	K		M			K	N		P		
	Roughing		PM	PM		K		M							
Cat. No.		New ACP100	New ACP200	New ACP300	New ACK200	New ACK300	New ACM200	New 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	New						●	●							1
13T6ANER-G	New						●	●							1
13T6ANER-FL	New						●	●							2
13T6ANER-FG	New						●	●							2
13T6ANFR-S	New								●		●				1
XNEU 13T6ANEN-W			●			●							●		3
ONMT 05T6ANER-L		●	●	●	●	●									4
05T6ANER-G		●	●	●	●	●									4
ONET 05T6ANER-L	New						●	●							4
05T6ANER-G	New						●	●							4

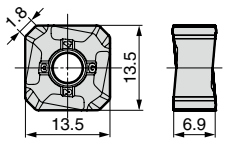
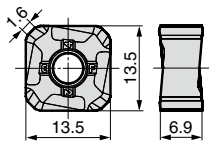
Fig 1


Fig 2


Wiper Insert H9 (Be careful during installation.)

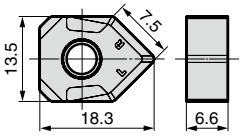
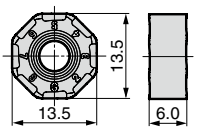
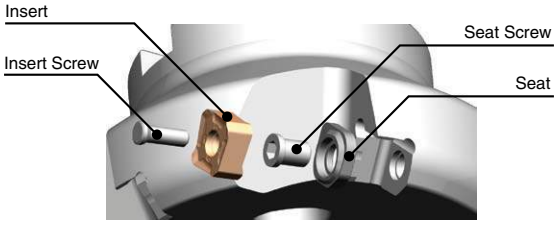
Fig 3


Fig 4


Wiper inserts can be used only in combination with square inserts.

* The new ACP100 and new ACK200 may vary in color or luster, but these variations do not affect the performance.

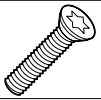


■ Identification Details

DGC M 13 050 R S

(1)	(2)	(3)	(4)	(5)	(6)
Cutter Series	M: Fine Pitched F: Extra-Fine Pitched	Insert Size	Cutter	Direction	Metric Bore

(Optional)

Insert Screw(*)

BFTX0418IP

■ Recommended Cutting Conditions

H31

■ Parts

Seat	Seat Screw	L Type Wrench	Insert Screw		Spanner	Anti-seizure Cream
DGCS13R	BW06509F	LH040	BFTX0412IP	N·m 3.0	TRDR15IP	SUMI-P

N·m Recommended Tightening Torque (N·m)

*Corners can be changed simply by loosening the screw. (Only applies to DGC / DGCM types with body size ϕ80 or above.

●mark: Standard stocked item (expanded item)

SEC-Sumi Dual Mill

DGCF13000R(S) Type

Rake Angle		
	Radial	−10°
	Axial	−5°

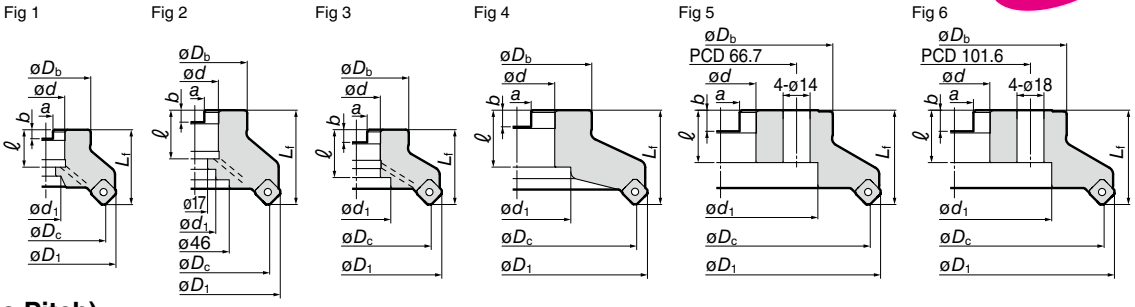
6mm 45° (SNMT/SNET) 3mm 45° (ONMT/ONET)

P (Steel) M (Stainless Steel) K (Cast Iron) N (Non-Ferrous Metal) S (Exotic Alloy) H (Hardened Steel)

General Milling for Steel & Cast Iron

Expansion

Fig 1 Fig 2 Fig 3 Fig 4 Fig 5 Fig 6



Body (Extra-Fine Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	ød1	No. of Teeth	Weight (kg)	Fig
Metric	DGCF 13050RS	●	50 (52.9)	64	40	40 (38.44)	22	10.4	6.3	20	18	5	0.3	1
	13063RS	●	63 (65.9)	77	50	40 (38.44)	22	10.4	6.3	20	18	6	0.5	1
	13080RS	●	*80 (82.9)	94	60	50 (48.44)	27	12.4	7	25	20	8	1.1	1
	13100RS	●	100 (102.9)	114	70	50 (48.44)	32	14.4	8.5	32	46	10	1.4	3
	13125RS	●	125 (127.9)	139	80	63 (61.44)	40	16.4	9.5	29	52	12	2.7	1
	13160RS	●	160 (162.9)	174	130	63 (61.44)	40	16.4	9.5	29	88	14	4.4	5
	13200RS	●	200 (202.9)	214	150	63 (61.44)	60	25.7	14	35	130	16	6.9	6
	13250RS	●	250 (252.9)	264	190	63 (61.44)	60	25.7	14	35	160	18	11	6
Imperial	DGCF 13080R	●	*80 (82.9)	94	60	50 (48.44)	25.4	9.5	6	25	20	8	1.1	1
	13100R	●	*100 (102.9)	114	70	63 (61.44)	31.75	12.7	8	32.5	28	10	2.1	2
	13125R	●	125 (127.9)	139	80	63 (61.44)	38.1	15.9	10	35.5	55	12	2.7	1
	13160R	●	160 (162.9)	174	100	63 (61.44)	50.8	19.1	11	38	72	14	4.4	4
	13200R	●	200 (202.9)	214	150	63 (61.44)	47.625	25.4	14	35	130	16	6.9	6
	13250R	●	250 (252.9)	264	190	63 (61.44)	47.625	25.4	14	35	150	18	11	6

Inserts are not included. Sizes ø160 mm or above do not have coolant holes. Figures in parentheses indicate values for ONMT/ONET type inserts.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

Inserts

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

Grade		Coated Carbide						Carbide		DLC		SUMIDIA		
Application	High Speed/Light	P			K		MS	KN		N		PM		
	General Purpose		PM	PM	K		MS		KS	N		P		
	Roughing		PM	PM		K		MS						
Cat. No.		ACP100 New	ACP200 New	ACP300 New	ACK200 New	ACK300 New	ACM200 New	ACM300 New	H1	EH520	DL1000		T4500A		Fig
SNMT 13T6ANER-L		●	●	●	●	●								1
13T6ANER-G		●	●	●	●	●				●			●	1
13T6ANER-H		●	●	●	●	●								1
13T6ANER-FL		●	●	●	●	●								2
13T6ANER-FG		●	●	●	●	●								2
SNET 13T6ANER-L	New						●	●						1
13T6ANER-G	New						●	●						1
13T6ANER-FL	New						●	●						2
13T6ANER-FG	New						●	●						2
13T6ANFR-S	New								●		●			1
XNEU 13T6ANEN-W			●			●							●	3
ONMT 05T6ANER-L		●	●	●	●	●								4
05T6ANER-G		●	●	●	●	●								4
ONET 05T6ANER-L	New						●	●						4
05T6ANER-G	New						●	●						4

Fig 1

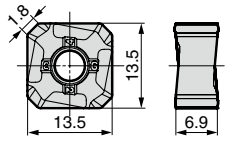
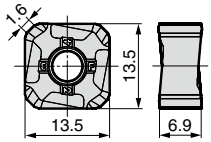


Fig 2



Wiper Insert H9 (Be careful during installation.)

Fig 3

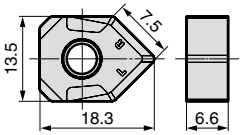
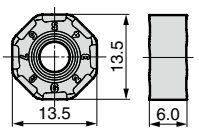
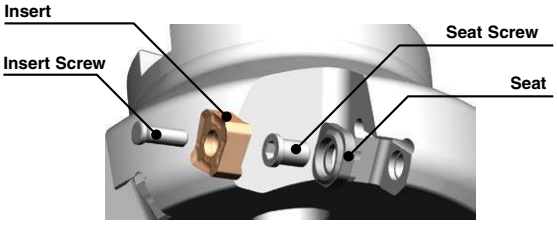


Fig 4



Wiper inserts can be used only in combination with square inserts.

* The new ACP100 and new ACK200 may vary in color or luster, but these variations do not affect the performance.



Identification Details

DGC F 13 050 R S

(1) Cutter Series
(2) M: Fine Pitched F: Extra-Fine Pitched
(3) Insert Size
(4) Cutter
(5) Direction
(6) Metric Bore

(Optional)

Insert Screw(*)

BFTX0418IP

Recommended Cutting Conditions

H31

Parts

Seat	Seat Screw	L Type Wrench	Insert Screw		Spanner	Anti-seizure Cream
DGCS13R	BW06509F	LH040	BFTX0412IP	N·m 3.0	TRDR15IP	SUMI-P

N·m Recommended Tightening Torque (N·m)

*Corners can be changed simply by loosening the screw. (Only applies to DGC / DGCM types with body size ϕ80 or above.

●mark: Standard stocked item (expanded item)

DGC13000EW Type

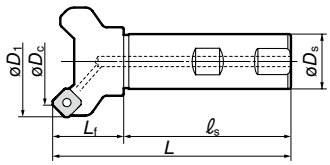
Rake Angle		
	Radial	−10°
	Axial	−5°

6mm 45° (SNMT/SNET) 3mm 45° (ONMT/ONET)

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

General Milling for Steel & Cast Iron

Expansion



Body (Shank Type)

Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)
DGC 13040EW	●	40(42.9)	54	32	40(38.44)	85	125	3	0.7
13050EW	●	50(52.9)	64	32	40(38.44)	85	125	3	0.9
13063EW	●	63(65.9)	77	32	40(38.44)	85	125	4	1.1

Figures in parentheses indicate values for ONMT/ONET type inserts.
Inserts are not included.

Inserts

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

Grade	Coated Carbide							Carbide		DLC		SUMIDIA		
Application: High Speed/Light	P			K		M S		K N		N		P M		
Application: General Purpose		P M	P M	K		M S			K S	N		P		
Application: Roughing		P M	P M		K		M S							
Cat. No.	ACP100 New	ACP200 New	ACP300 New	ACK200 New	ACK300 New	ACM200 New	ACM300 New	H1	EH520	DL1000		T4500A		Fig
SNMT 13T6ANER-L	●	●	●	●	●									1
13T6ANER-G	●	●	●	●	●				●			●		1
13T6ANER-H	●	●	●	●	●									1
13T6ANER-FL	●	●	●	●	●									2
13T6ANER-FG	●	●	●	●	●									2
SNET 13T6ANER-L New						●	●							1
13T6ANER-G New						●	●							1
13T6ANER-FL New						●	●							2
13T6ANER-FG New						●	●							2
13T6ANFR-S New								●		●				1
XNEU 13T6ANEN-W		●			●							●		3
ONMT 05T6ANER-L	●	●	●	●	●									4
05T6ANER-G	●	●	●	●	●									4
ONET 05T6ANER-L New						●	●							4
05T6ANER-G New						●	●							4

Fig 1

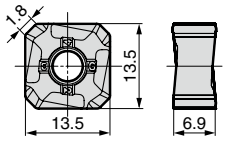
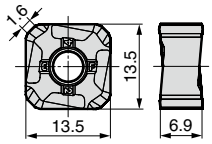


Fig 2



Wiper Insert

H1 (Be careful during installation.)

Fig 3

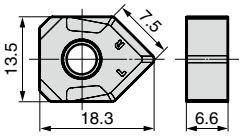
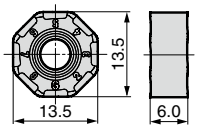
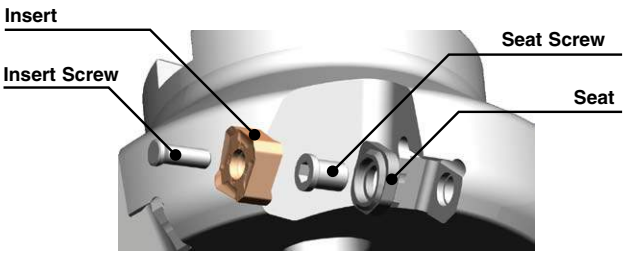


Fig 4



Wiper inserts can be used only in combination with square inserts.

* The new ACP100 and new ACK200 may vary in color or luster, but these variations do not affect the performance.



Identification Details

DGC 13 040 EW

(1) Cutter Series (2) Insert Size (3) Cutter (4) Endmill Type

Parts

Seat	Seat Screw	L Type Wrench	Insert Screw		Spanner	Anti-seizure Cream
DGCS13R	BW0609F	LH040	BFTX0412IP	3.0	TRDR15IP	SUMI-P

(Optional)

Insert Screw(*)
BFTX0418IP

Recommended Cutting Conditions H31

N·m Recommended Tightening Torque (N·m)

*Corners can be changed simply by loosening the screw. (Only applies to DGC / DGCM types with body size ϕ80 or above.

UFO4000 Type

Rake Angle		
	Radial	−7°
	Axial	+27°

5.5mm 45°

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

General Milling for Steel and Hard-to-cut Material

Fig 1

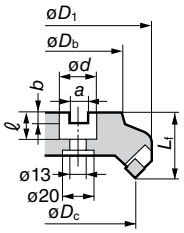


Fig 2

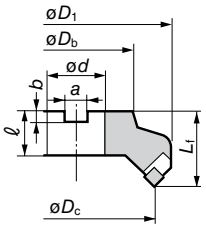


Fig 3

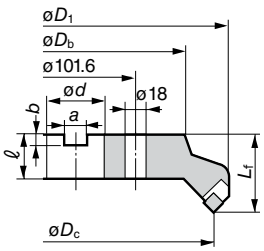
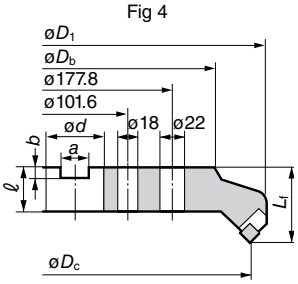


Fig 4



Body Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
UFO 4080R	●	**UFO 4080L**		***80**	102	60	50	**25.4**	9.5	6	25	4	2.1	1
4100R	●	**4100L**		**100**	122	70	50	**31.75**	12.7	8	32	5	2.9	2
4125R	●	**4125L**		**125**	146	75	63	**38.1**	15.9	10	38	6	4.2	2
4160R	●	**4160L**		**160**	180	100	63	**50.8**	19.1	11	38	8	6.6	2
4200R	●	**4200L**		**200**	220	130	63	**47.625**	25.4	14	35	10	9.5	3
UFO 4250R	●	**UFO 4250L**		**250**	270	130	63	**47.625**	25.4	14	35	12	14.8	3
4315R		**4315L**		**315**	335	240	80	**47.625**	25.4	14	35	14	26.6	4

Inserts are not included.

*Please use hexagonal bolt (JISB1176) M12 × 30 to 35mm for securing ø80 cutter to the arbour.

Inserts

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

Grade		Coated Carbide								Carbide				SUMIDIA			
Application	High Speed/Light	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		●	●							●				●			5
12T3AZTN-S										●							5
12T3AZTN-W																	5
12T3AZFN												●					5
SFKN 12T3AZTN		●	●	●						●				●			6(7)
12T3AZTN-S										●							7
12T3AZTN-W														●			7
12T3AZFN					●	●	●				●						6(7)
SFKR 12T3AZEN		●								●							8
UW 12500R													●				9

Fig 5

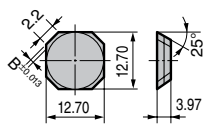


Fig 6 (ACP / ACK Series Grades)

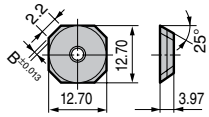


Fig 7

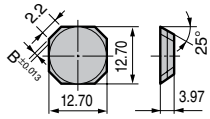


Fig 8

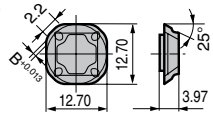
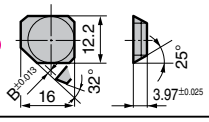
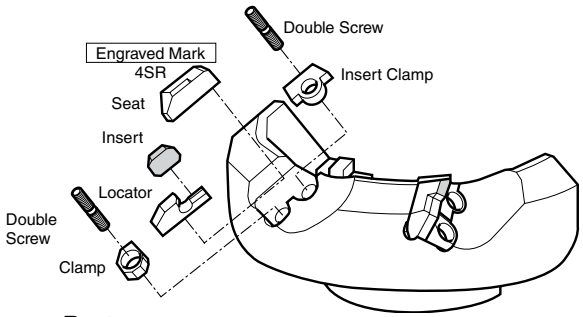


Fig 9

Wiper Insert



* -S: Sharp edge, -W: Strong edge



Spare Parts

Applicable Cutters	Locator Clamp	Insert Clamp	Double Screw	Size	N·m	Seat	Locator
UFO 4000R Type	UFKWR	UFTWR	WB7-15T	M7	8.0	UF4SR	UF4KR
UFO 4000L Type	UFKWL	UFTWL	WB7-15T	M7	8.0	UF4SL	UF4KL

Note: Spanner used is TT25.

N·m Recommended Tightening Torque (N·m)

Identification Details

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	100-**175**-250	0.15-**0.23**-0.30	ACP200
P	Soft 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, cutting depth, and other factors.

UFO5000 Type

Rake Angle		
	Radial	−7°
	Axial	+27°

7.5mm 45°

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

General Milling for Steel and Hard-to-cut Material

Fig 1

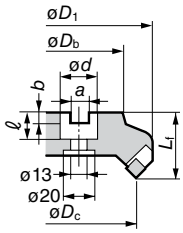


Fig 2

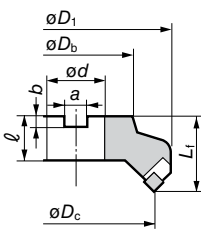


Fig 3

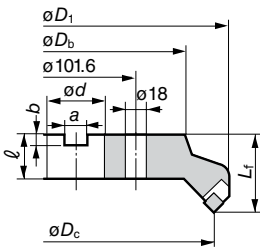
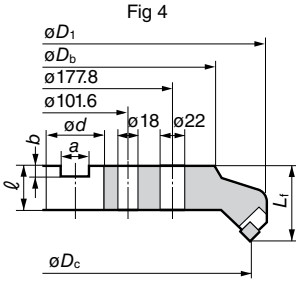


Fig 4



Body Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
UFO 5080R		**UFO 5080L**		**80***	102	60	50	**25.4**	9.5	6	25	4	2.0	1
5100R	●	**5100L**		**100**	119	70	50	**31.75**	12.7	8	32	5	2.8	2
5125R	●	**5125L**		**125**	143	75	63	**38.1**	15.9	10	38	6	4.0	2
5160R	●	**5160L**		**160**	177	100	63	**50.8**	19.1	11	38	8	6.4	2
5200R	●	**5200L**		**200**	217	130	63	**47.625**	25.4	14	35	10	9.2	3
UFO 5250R		**UFO 5250L**		**250**	267	130	63	**47.625**	25.4	14	35	12	14.4	3
5315R		**5315L**		**315**	332	240	80	**47.625**	25.4	14	35	14	26.1	4

Inserts are not included.

*Please use hexagonal bolt (JISB1176) M12 × 30 to 35mm for securing ø80 cutter to the arbour.

Inserts

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

Grade		Coated Carbide								Carbide				SUMIDIA			
Application	High Speed/Light	P			K		M					N					
	General Purpose		PM	PM	K					P	K		K	P			
	Roughing		PM	PM		K											
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z			A30N	G10E	H1	H10E	T250A			Fig
SFEN 1504AZTN		●	●							●				●			5
1504AZTN-S																	5
1504AZTN-W																	5
1504AZFN																	5
SFKN 1504AZTN		●	●	●						●				●			6(7)
1504AZTN-S																	7
1504AZTN-W																	7
1504AZFN					●		●				●						6(7)
UW 15500R													●				8
UW 15500L																	—

Fig 5

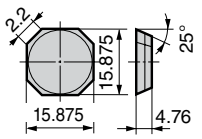


Fig 6 (ACP / ACK Series Grades)

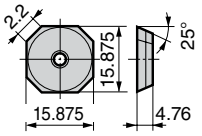


Fig 7

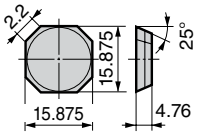
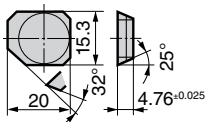
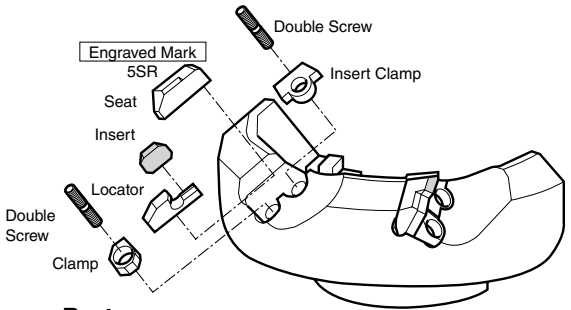


Fig 8

Wiper Insert



* -S: Sharp edge, -W: Strong edge



Spare Parts

Applicable Cutters	Locator Clamp	Insert Clamp	Double Screw	Size	N·m	Seat	Locator
UFO 5000R Type	UFKWR	UFTWR	WB7-15	M7	8.0	UF5SR	UF5KR
UFO 5000L Type	UFKWL	UFTWL	WB7-15	M7	8.0	UF5SL	UF5KL

Note: Spanner used is TT25.

N·m Recommended Tightening Torque (N·m)

Identification Details

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	100-**175**-250	0.15-**0.23**-0.30	ACP200
P	Soft 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, cutting depth, and other factors.

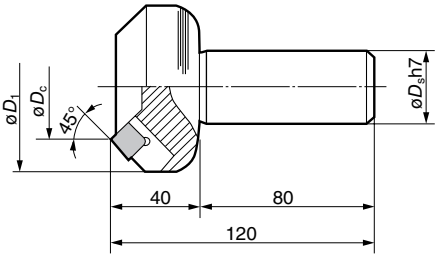
UFO4000E Type

Rake Angle		
	Radial	−7°
	Axial	+27°

5.5mm 45°

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

General Milling for Steel and Hard-to-cut Material



Body

Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDs	No. of Teeth	Maximum Depth of Cut	Axial Rake	Radial Rake
UFO 4050ER	●	**50**	74	32	4	5.5	+27°	−7°
4050ERS42		**50**	74	42	4			
4063ER	●	**63**	86	32	5			
4063ERS42		**63**	86	42	5			
4080ER	●	**80**	103	32	6			
UFO 4080ERS42		**80**	103	42	6	5.5	+27°	−7°
4100ER		**100**	122	32	7			
4100ERS42		**100**	122	42	7			

Inserts are not included.

Inserts

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

Grade		Coated Carbide							Carbide				Cermet		
Application	High Speed/Light	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

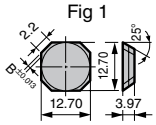


Fig 2 (ACP/ACK Series Grades)

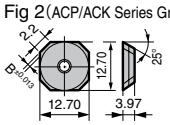


Fig 3

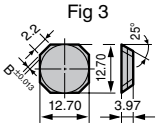


Fig 4

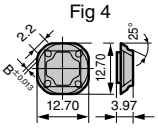
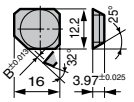
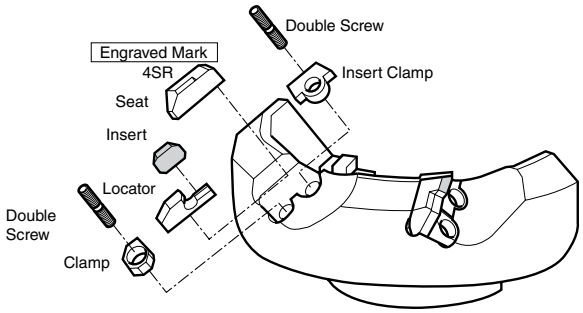


Fig 5



Wiper Inserts



Spare Parts

Applicable Cutters	Locator Clamp	Insert Clamp	Double Screw	Size	N·m	Seat	Locator	Spanner
UFO 4000E Type	UFKWR	UFTWR	WB7-15T	M7	8.0	UF4SR	UF4KR	TT25

Note: Spanner used is TT25.

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

External Diameter ø50 to ø63 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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	Light Alloy/Non-ferrous Metal	—	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, cutting depth, and other factors.

External Diameter ø80 to ø100 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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	Light Alloy/Non-ferrous Metal	—	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, cutting depth, and other factors.

FPG4000/5000 Type

Rake Angle		
Radial	−4°	
Axial	+15°	

6.5mm 45° (4000 Type)

8.5mm 45° (5000 Type)

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

General Milling for Steel and Hard-to-cut Material

Fig 1

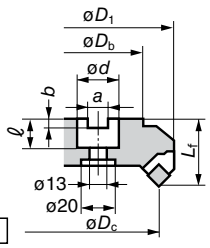


Fig 2

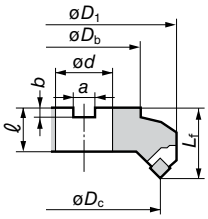


Fig 3

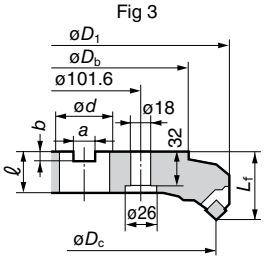
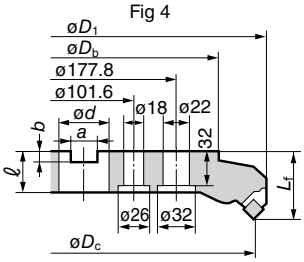


Fig 4



■ Milling Cutter Body

Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
FPG 4080R	●	**FPG 4080L**	●	*80	105	60	50	25.4	9.5	6	25	4	1.9	1
4100R	●	**4100L**		100	124	70	60	31.75	12.7	8	32	5	3.0	2
4125R	●	**4125L**	●	125	148	105	60	38.1	15.9	10	38	6	4.5	2
4160R	●	**4160L**	●	160	182	135	60	50.8	19.1	11	38	8	6.7	2
4200R	●	**4200L**		200	222	130	60	47.625	25.4	13.5	40	10	9.4	3
4250R	●	**4250L**		250	271	130	70	47.625	25.4	13.5	40	12	16.2	3
4315R	●	**4315L**		315	336	240	70	47.625	25.4	13.5	40	14	24.6	4
FPG 5080R		**FPG 5080L**		*80	105	60	50	25.4	9.5	6	25	4	1.9	1
5100R	▲	**5100L**		100	124	70	60	31.75	12.7	8	32	5	3.0	2
5125R	▲	**5125L**		125	148	80	60	38.1	15.9	10	38	6	4.5	2
5160R	▲	**5160L**		160	182	100	60	50.8	19.1	11	38	8	6.7	2
5200R	▲	**5200L**		200	222	130	60	47.625	25.4	13.5	40	10	9.4	3
5250R		**5250L**		250	271	130	70	47.625	25.4	13.5	40	12	16.2	3
5315R		**5315L**		315	336	240	70	47.625	25.4	13.5	40	14	24.6	4

Inserts are not included.

*Please use hexagonal bolt (JISB1176) M12 × 30 to 35mm for securing ø80 cutter to the arbour.

■ Inserts

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

Grade		Coated Carbide								Carbide		Cermet			SUMIDIA	
Application	High Speed/Light	P			K		M					P	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	T1200A	T250A	DA1000	DA2200
SDEX 42MT										●		●	▲	●	—	—
SDKN 42M					●	●	●				●				—	—
NF-SDKN 42M		—	—	—	—	—	—			—	—			—	●	▲
SDKN 42MT		●	●	●						●		●	▲	●	—	—
42MT-W														●	—	—
＊SDNN 1203AETN		●	●	—	—	—	—			●	—		—	●	—	—
SDMR 1203AEEN		●	●							●				—	—	—
1203AETN		—	—	—	—	—	—			—	—		—	●	—	—
SDEX 53MT										●				●	—	—
SDKN 53M					●	●	●				●				—	—
53MT		●	●	●						●				●	—	—

Fig
6
5(6)
6
5(6)
6
6
7
7
9
8(9)
8(9)

Note:Item marked ＊ B ±0.08

Fig 5 (ACP/ACK Series Grades)

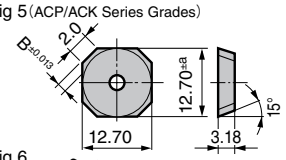


Fig 6

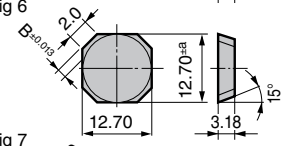


Fig 7

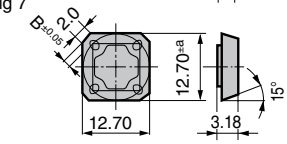


Fig 8 (ACP/ACK Series Grades)

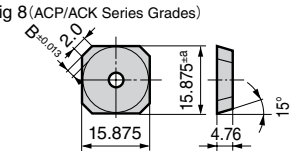
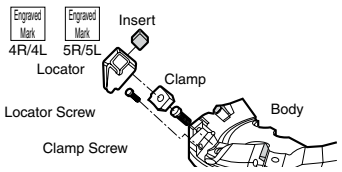


Fig 9...Same as Fig. 8 without insert hole

● Applicable Inserts

Body	Insert
FPG4000 Type	SDOO42・・ SDOO12・・
FPG5000 Type	SDOO53・・



■ Spare Parts

Applicable Cutters	Locator Screw	Size	N·m	Clamp Screw	Clamp	Locator
FPG4000R Type	FBH0512	M5	5.0	FBX0817	FPWR	LFP4R
FPG4000L Type					FPWL	LFP4L
FPG5000R Type	FBH0512	M5	5.0	FBX0817	FPWR	LFP5R
FPG5000L Type					FPWL	LFP5L

N·m Recommended Tightening Torque (N·m)

Note: T-wrenches used are TH030 (locator screw) and TH040 (clamp screw).

■ Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	100-**130**-160	0.15-**0.28**-0.40	ACP200
P	Soft 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**-1000	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, cutting depth, and other factors.

▲mark : To be replaced by new item (Please confirm stock availability)

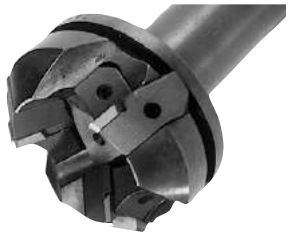
FPE 4000 Type

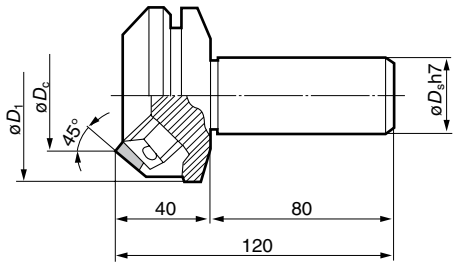
Rake Angle		
	Radial	−3°
	Axial	+15°

6.5mm 45°

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

General Milling for Steel and Hard-to-cut Material





Body

Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDs	No. of Teeth	Max. Depth of Cut	Axial Rake	Radial Rake
FPE 4050R	●	50	72	32	3	6.5	+15°	−3°
4050RS42		50	72	42	3			
4063R	●	63	85	32	4			
4063RS42		63	85	42	4			
4080R	●	80	100	32	4			
FPE 4080RS42		80	100	42	4	6.5	+15°	−3°
4100R		100	118	32	5			
4100RS42		100	118	42	5			

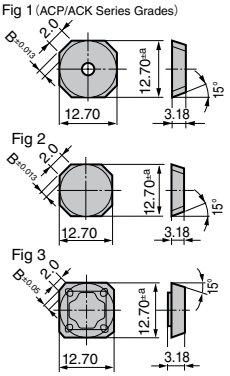
Inserts are not included.

Inserts

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

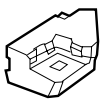
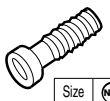
Grade		Coated Carbide							Carbide			Cermet			SUMIDIA		
Application	High Speed/Light	P			K		M					P	P		N	N	
	General Purpose		PM	PM	K				P	K				P	N	N	
	Roughing		PM	PM		K									N	N	
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z		A30N	G10E		T1500A	T1200A	T250A	DA1000	DA2200	Fig
SDEX 42MT									●			●	▲	●	—	—	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 (ACP/ACK Series Grades)



Note: Item marked ✻ :B ±0.08

Spare Parts

Locator	Clamp	Clamp Screw	Size	N·m	Locator Screw	Spanner
						
LFE4R	FEWR	FBX0817	M8	8.0	FBH0512	TH040

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

External Diameter ø50 to ø63 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	180 to 280HB	100-**125**-150	0.10-**0.20**-0.30	ACP200
	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, cutting depth, and other factors.

Recommended Cutting Conditions

External Diameter ø80 to ø100 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	180 to 280HB	100-**125**-150	0.10-**0.25**-0.40	ACP200
	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, cutting depth, and other factors.

▲mark : To be replaced by new item (Please confirm stock availability) to be replaced by the new T1500A.

EHG4000/5000Type

Rake Angle	Radial	−3°
	Axial	+20°

5.5mm 45° (4000 Type)　7.5mm 45° (5000 Type)

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

General Milling for Steel and Hard-to-cut Material

Fig 1

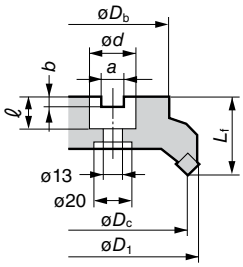


Fig 2

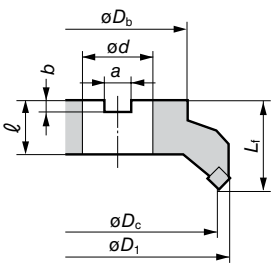
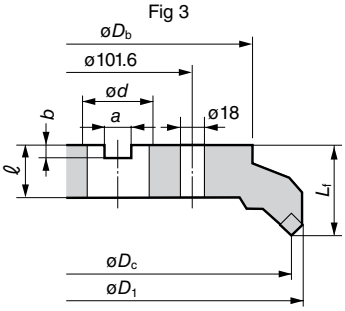


Fig 3



■ Body　Imperial

Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Weight (kg)	Fig
		øDc	øD1	øDb	Lf	ød	a	b	ℓ			
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	80	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	80	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 not included.

*Please use hexagonal bolt (JISB1176) M12 x 30-35 mm for securing ø80 cutter to the arbour.

■ Inserts

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

Grade		Coated Carbide						Carbide			Cermet				
Application	High Speed/Light	P			K		M								
	General Purpose		PM	PM	K			P	K		P				
	Roughing		PM	PM		K									
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	G10E		T250A		Dimensions A	Dimensions s	Fig
SECN 42MT								●			●		12.70	3.18	4
42M													12.70	3.18	4
SEEN 42MT		●	●	●									12.70	3.18	6*
SEKN 42MT		●	●	●				●			●		12.70	3.18	5(6)
42MT-W											●		12.70	3.18	6
42M					●	●	●		●				12.70	3.18	5(6)
＊**SENN 1203AFTN**		●	—	—	—	—	—	●	—		●		12.70	3.18	6
SEMR 1203AFEN		●	—	—	—	—	—	●	—		—		12.70	3.18	7
＊＊**SEER 1203AFEN**		●	—	—	—	—	—	●	—		—		12.70	3.18	7
SECN 53MT													15.875	4.76	4
53M													15.875	4.76	4
SEKN 53MT		●	●	●				●			●		15.875	4.76	6
53M					●	●							15.875	4.76	6

Fig 4

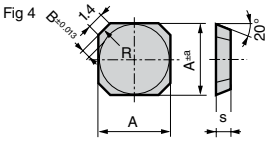


Fig 5 (ACP/ACK Series Grades)

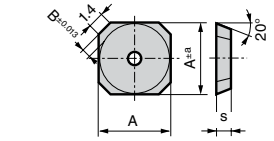
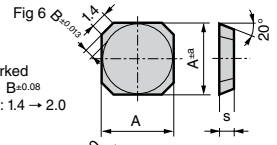
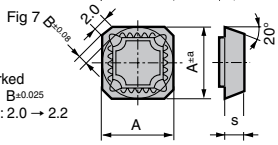


Fig 6



Note:
Item marked B±0.08
Chamfer: 1.4 → 2.0

Fig 7

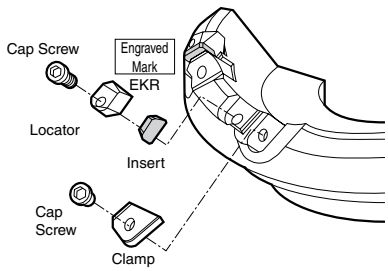


Note:
Item marked B±0.025
Chamfer: 2.0 → 2.2

* Shape of E class inserts differ slightly from the above figures.

● Applicable Insert

Body	Inserts
EHG4000 Type	SE○N42・・ SE○○12・・
EHG5000 Type	SE○N53・・



■ Spare Parts

Applicable Cutters	Locator	Clamp	Cap Screw	Size	N·m	Spanner
EHG4000R Type	EHK4R	EHW4R	EHBX0512	**M5**	**5.0**	TH040
EHG5000R Type	EHK5R	EHW5R				

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	160-**205**-250	0.10-**0.15**-0.20	ACP200
P	Soft 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, cutting depth, and other factors.

DNX(F)/DNH,DNHS Type

High Efficiency Face Milling Cutters for Cast Iron and Cast Steel

■ Characteristics

- ●Achieves high efficiency milling with a max. 8 mm depth of cut!
- ●Employs negative inserts with chipbreakers that have a strong cutting edge on the double negative type body! Economical, uses 8 corners!
- ●Supports general to high-efficiency high feed milling with three body types! Inserts can be shared on all types!

Negative inserts with a rake angle achieve low cutting force and high feed milling!!

■ Series

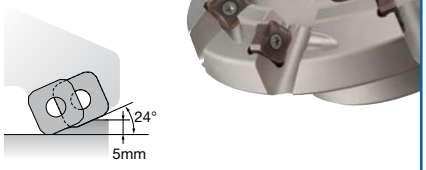
DNX(F) Type

General Purpose Type

Max. Depth of Cut		8mm
Approach Angle		65°
Cutter	DNX 12000R(S) General Purpose Type	ø80 to ø250mm
	DNXF 12000R(S) General Purpose Fine Pitch Type	ø80 to ø160mm

DNHS Type

Medium Depth of Cut High Feed Type



Max. Depth of Cut		5mm
Approach Angle		24°
Cutter	DNHS 12000R Medium Depth of Cut High Feed Type	ø80 to ø160mm

DNH Type

Small Depth of Cut High Feed Type

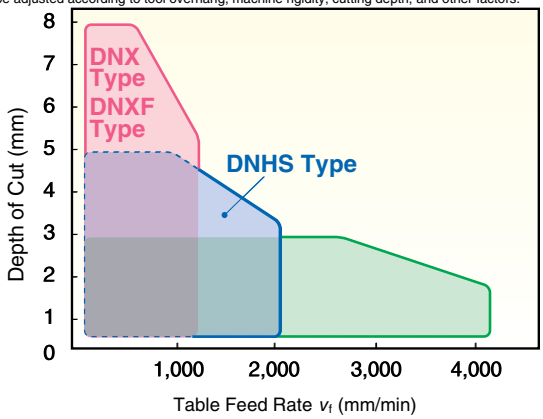
Max. Depth of Cut		3mm
Approach Angle		24°
Cutter	DNH 12000R Small Depth of Cut High Feed Type	ø80 to ø160mm

Large ◀ Depth of Cut — Feed Rate ▶ Large

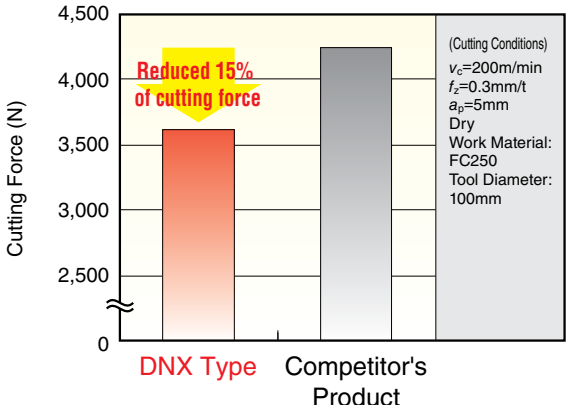
■ Application Range (Cast Iron)

Cut carbon steel at 20 to 30% reduction.

* The below conditions are provided as a general guide. Actual conditions will need to be adjusted according to tool overhang, machine rigidity, cutting depth, and other factors.



■ Performance Comparison



■ Recommended Cutting Conditions

DNX Type／DNXF Type

ISO	Work Material	Hardness	Cutting Speed v_c(m/min) Min.- **Optimum** -Max.	Feed Rate f_z(mm/t) Min.- **Optimum** -Max.	Grade
K	Cast Iron	250HB	150-**225**-300	0.10-**0.20**-0.30	ACK200 ACK300
	Ductile Cast Iron	250HB	150-**200**-250	0.10-**0.18**-0.25	ACK200 ACK300
P	Carbon Stee	180 to 280HB	150-**175**-200	0.10-**0.15**-0.20	ACP200
	Alloy Steel	180 to 280HB	150-**175**-200	0.10-**0.15**-0.20	ACP200

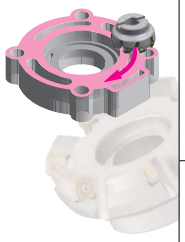
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

DNHS Type／DNH Type

ISO	Work Material	Hardness	Cutting Speed v_c(m/min) Min.- **Optimum** -Max.	Feed Rate f_z(mm/t) Min.- **Optimum** -Max.	Grade
K	Cast Iron	250HB	150-**225**-300	0.10-**0.55**-1.00	ACK200 ACK300
	Ductile Cast Iron	250HB	150-**200**-250	0.10-**0.55**-1.00	ACK200 ACK300
P	Carbon Stee	180 to 280HB	150-**175**-200	0.10-**0.45**-0.80	ACP200
	Alloy Steel	180 to 280HB	150-**175**-200	0.10-**0.35**-0.60	ACP200

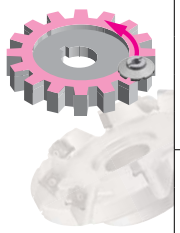
Note For the DNHS, insert heights are alternatively located, so the actual feed rate per tooth is doubled. Use with f_z=0. 5mm/t (actual feed rate 1.0 mm/t) as the upper limit. The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

■ Application Examples



Part/Work Material		Automotive Component/FC250	
Used Equipment		Machining Centre (BT30)	
Tool	Manufacturer	Sumitomo	Conventional Tool
	Body	DNXF 12080R	General Purpose Cutter
	Inserts	G Type	Negative Insert
	Tool Diameter(mm)	80	80
	No. of Flutes	8	8
	Insert	ACK200	K Series CVD
Cutting Conditions	Cutting Speed (m/min)	200	200
	Feed (mm/t)	0.069 (v_f=420mm/min)	0.069 (v_f=420mm/min)
	Axial Cutting Depth (mm)	1.6	1.6
	Cutting Width (mm)	60	60
	Dry/Wet	Wet	Wet

2x longer tool life than conventional tools under the same conditions.



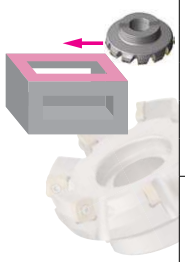
Part/Work Material		Construction Machine Component/Cast Steel	
Used Equipment		Machining Centre (BT50)	
Tool	Manufacturer	Sumitomo	Conventional Tool
	Body	DNHS 12100R	General Purpose Cutter
	Inserts	H Type	Negative Insert
	Tool Diameter(mm)	100	100
	No. of Flutes	8(4)*	7
	Insert	ACP200	P Series CVD
Cutting Conditions	Cutting Speed (m/min)	140	200
	Feed (mm/t)	0.25 (v_f=450mm/min)	0.095 (v_f=300mm/min)
	Axial Cutting Depth (mm)	3 to 4	3 to 4
	Cutting Width (mm)	50	50
	Dry/Wet	Dry	Dry

Compared to the conventional tool, 1.5x high efficiency milling is possible.

* ( ) indicates no. of effective teeth

Part/Work Material		Electrical Appliance Component/FC250	
Used Equipment		Machining Centre (BT50)	
Tool	Manufacturer	Sumitomo	Conventional Tool
	Body	DNXF 12100R	General Purpose Cutter
	Inserts	H Type	Negative Insert
	Tool Diameter(mm)	100	100
	No. of Flutes	10	10
	Insert	ACK200	K Series CVD
Cutting Conditions	Cutting Speed (m/min)	314	314
	Feed (mm/t)	0.15 (v_f=1,500mm/min)	0.11 (v_f=1,100mm/min)
	Axial Cutting Depth (mm)	1.5	1.5
	Cutting Width (mm)	80	80
	Dry/Wet	Wet	Wet

Compared to the conventional tool, 1.4x high efficiency milling, 1.3x tool life.



Part/Work Material		Housing/FC250	
Used Equipment		Machining Centre (BT50)	
Tool	Manufacturer	Sumitomo	Conventional Tool
	Body	DNX 12160R	General Purpose Cutter
	Inserts	G Type	Negative Insert
	Tool Diameter(mm)	160	160
	No. of Flutes	10	10
	Insert	ACK200	K Series CVD
Cutting Conditions	Cutting Speed (m/min)	200	200
	Feed (mm/t)	0.15 (v_f=597mm/min)	0.10 (v_f=398mm/min)
	Axial Cutting Depth (mm)	3.5	3.5
	Cutting Width (mm)	135	135
	Dry/Wet	Wet	Wet

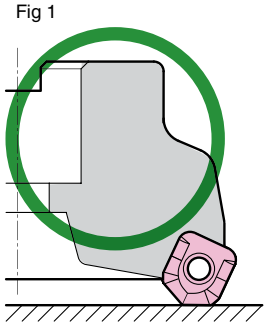
1.5x longer tool life than conventional tools.

■ Important Notes About Wiper Inserts

- When attaching the wiper insert, attach it as shown in Fig 1. When attached as shown in Fig 2, the normal 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.

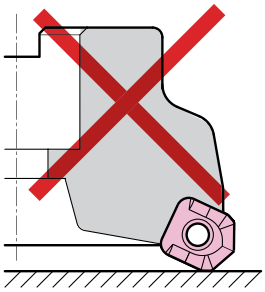
DNX(F) Type

Fig 1



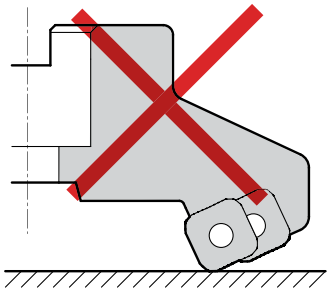
Correct Attachment

Fig 2



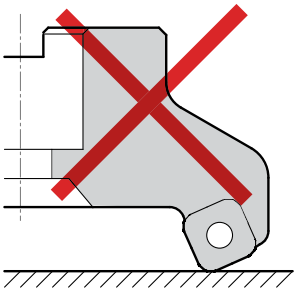
Incorrect Attachment

DNHS Type



Inappropriate

DNH Type



Inappropriate

DNX(F)12000 Type

Rake Angle		
	Radial	−6°
	Axial	−5°

Max. Depth of Cut 8mm / 65°

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

High Efficiency Cast Iron/Cast Steel Milling

Fig 1

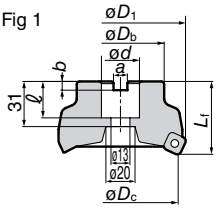


Fig 2

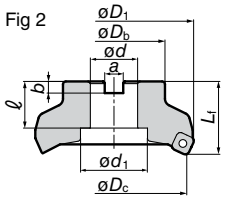


Fig 3

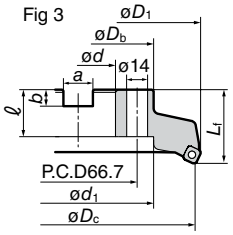
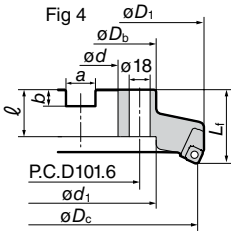


Fig 4



■ Body (DNX 12000R) Approach Angle 65°

General Purpose Type

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	ød1	Lf	ød	a	b	ℓ	No. of Teeth	Effective Teeth	Weight (kg)	Fig
Metric	DNX 12080RS	●	*80	88	60	13.5	50	27	12.4	7	25	6	6	1.2	1
	12100RS	●	100	108	80	46	50	32	14.4	8.5	29	7	7	1.6	2
	12125RS	●	125	133	80	56	63	40	16.4	9.5	29	8	8	2.8	2
	12160RS	●	160	168	100	88	63	40	16.4	9.5	29	10	10	4.4	3
	12200RS	●	200	210	150	130	63	60	25.7	14	35	16	16	8.0	4
	12250RS	●	250	260	180	160	63	60	25.7	14	35	20	20	12.2	4
Imperial	DNX 12080R	●	*80	88	60	13	50	25.4	9.5	6	25	6	6	1.2	1
	12100R	●	100	108	70	46	50	31.75	12.7	8	32	7	7	1.6	2
	12125R	●	125	133	80	56	63	38.1	15.9	10	38	8	8	2.8	2
	12160R	●	160	168	100	72	63	50.8	19.1	11	38	10	10	4.4	2
	12200R	●	200	210	150	130	63	47.625	25.4	14	35	16	16	8.0	4
	12250R	●	250	260	180	160	63	47.625	25.4	14	35	20	20	12.2	4

■ Body (DNXF 12000R) Approach Angle 65°

General Purpose Fine Pitch Type

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	ød1	Lf	ød	a	b	ℓ	No. of Teeth	Effective Teeth	Weight (kg)	Fig
Metric	DNXF 12080RS	●	*80	88	60	13.5	50	27	12.4	7	25	8	8	1.2	1
	12100RS	●	100	108	80	46	50	32	14.4	8.5	29	10	10	1.6	2
	12125RS	●	125	133	80	56	63	40	16.4	9.5	29	11	11	2.7	2
	12160RS	●	160	168	100	88	63	40	16.4	9.5	29	12	12	4.4	3
Imperial	DNXF 12080R	●	*80	88	60	13	50	25.4	9.5	6	25	8	8	1.2	1
	12100R	●	100	108	70	46	50	31.75	12.7	8	32	10	10	1.6	2
	12125R	●	125	133	80	56	63	38.1	15.9	10	38	11	11	2.7	2
	12160R	●	160	168	100	72	63	50.8	19.1	11	38	12	12	4.4	2

*Cutters with sizes of ø200 mm or above come with locators. Inserts are not included.

*Please use hexagonal bolt (JISB1176) M12 x 30-35 mm for securing ø80 cutter to the arbour.

■ Identification Details

DNX F 12 080 R S

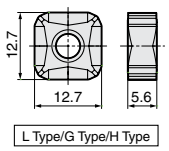
(1) Cutter Series | (2) Fine-Pitch Indication | (3) Insert Size | (4) Cutter | (5) Direction | (6) Metric Bore

■ Inserts

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

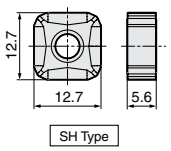
Grade		Coated Carbide							
Application	High Speed/Light	K	K						
	General Purpose	K	K		PM	PM			
	Roughing			K	PM	PM			
Cat. No.		ACK100	ACK200	ACK300	ACP200	ACP300	Holder Style	Application	Fig
SNMT 1205ZNEN-L			●	●	●		V-shaped Cutting Edge Type	Light Cutting	5
1205ZNEN-G		●	●	●	●			General Purpose	5
1205ZNEN-H		●	●	●	●			Heavy Cutting	5
SNMT 1205ZNEN-SH		●	●	●	●	●	Straight Type	Chip Management	6
XNGT 1205ZNEN-W			●	●			Wiper Type	Improved Surface Roughness	7

Fig 5



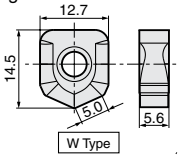
L Type/G Type/H Type

Fig 6



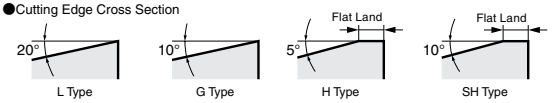
SH Type

Fig 7 Wiper Insert



W Type

●Cutting Edge Cross Section



■ Spare Parts

Locator (*)	Cap Screw (*)	L Type Spanner (*)	Screw		Spanner	Anti-seizure Cream
				N·m		
DNXK12R	BX0515	LH040	BFTX0412IP	3.0	TRDR15IP	SUMI-P

* Included with cutters ø200 mm or larger

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions H42

DNH(S)12000 Type

Rake Angle		
	Radial	−6°
	Axial	−5°

Max. Depth of Cut 3mm 24° (DNH Type)

Max. Depth of Cut 5mm 24° (DNHS Type)

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

High Efficiency Cast Iron/Cast Steel Milling

Fig 1

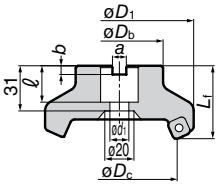


Fig 2

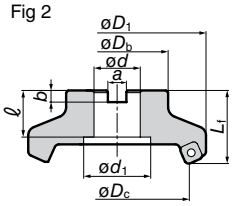


Fig 3

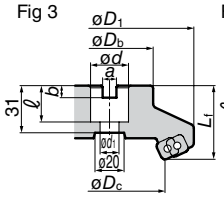
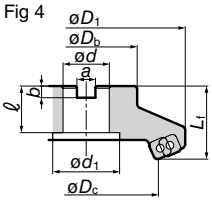


Fig 4



■ Body (DNH 12000R) Approach Angle 24°

Small Depth of Cut High Feed Type | Imperial

Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	ød1	Lf	ød	a	b	ℓ	No. of Teeth	Effective Teeth	Weight (kg)	Fig
DNH 12080R	●	*80	104	60	13	50	25.4	9.5	6	25	6	6	1.5	1
12100R	●	100	124	70	46	50	31.75	12.7	8	32	7	7	1.9	2
12125R	●	125	149	80	56	63	38.1	15.9	10	38	8	8	3.2	2
12160R	●	160	184	100	72	63	50.8	19.1	11	38	10	10	5.1	2

■ Body (DNHS 12000R) Approach Angle 24°

Medium Depth of Cut High Feed Type | Imperial

DNHS 12080R	●	*80	116	60	13	50	25.4	9.5	6	25	6	3	1.7	3
12100R	●	100	136	70	46	50	31.75	12.7	8	32	8	4	2.3	4
12125R	●	125	161	80	56	63	38.1	15.9	10	38	10	5	3.2	4
12160R	●	160	196	100	72	63	50.8	19.1	11	38	12	6	6.2	4

*Cutters with sizes of ø200 mm or above come with locators. Inserts are not included.

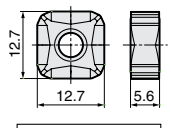
*Please use hexagonal bolt (JISB1176) M12 x 30-35 mm for securing ø80 cutter to the arbour.

■ Inserts

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

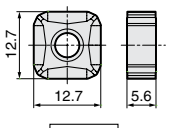
Grade		Coated Carbide							
Application	High Speed/Light	K	K						
	General Purpose	K	K		PM	PM			
	Roughing			K	PM	PM			
Cat. No.		ACK100	ACK200	ACK300	ACP200	ACP300	Holder Style	Application	Fig
SNMT 1205ZNEN-L			●	●	●		V-shaped Cutting Edge Type	Light Cutting	5
1205ZNEN-G		●	●	●	●			General Purpose	5
1205ZNEN-H		●	●	●	●			Heavy Cutting	5
SNMT 1205ZNEN-SH		●	●	●	●	●	Straight Type	Chip Management	6
XNGT 1205ZNEN-W			●	●			Wiper Type	Improved Surface Roughness	7

Fig 5



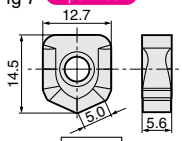
L Type/G Type/H Type

Fig 6



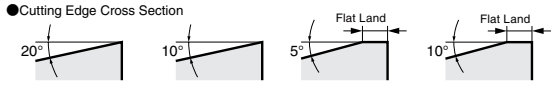
SH Type

Fig 7 Wiper Insert



W Type

●Cutting Edge Cross Section



■ Spare Parts

Locator (*)	Cap Screw (*)	L Type Spanner (*)	Screw		Spanner	Anti-seizure Cream
				N·m		
DNXK12R	BX0515	LH040	BFTX0412IP	3.0	TRDR15IP	SUMI-P

* Included with cutters ø200 mm or larger

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions H42

SEC-ACE MILL

DNF4000 Type

Rake Angle		
	Radial	−6°
	Axial	−5°

6.5mm / 65°

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

General Milling for Steel & Cast Iron

Fig 1

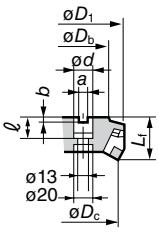


Fig 2

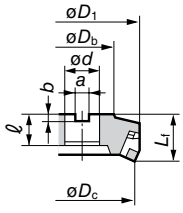


Fig 3

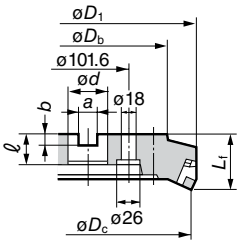
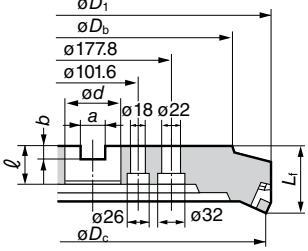


Fig 4



Body

Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
DNF 4080R	●	DNF 4080L		*80	96	60	50	25.4	9.5	6	25	6	1.8	1
4100R	●	4100L	●	100	116	75	60	31.75	12.7	8	32	8	3.0	2
4125R	●	4125L		125	141	75	60	38.1	15.9	10	38	10	4.3	2
4160R	●	4160L		160	176	100	60	50.8	19.1	11	38	12	6.8	2
4200R	●	4200L		200	216	130	60	47.625	25.4	13.5	38	16	9.8	3
DNF 4250R		DNF 4250L		250	266	200	70	47.625	25.4	13.5	40	20	18.1	3
4315R		4315L		315	331	240	70	47.625	25.4	13.5	40	24	27.4	3
4400R		4400L		400	416	300	80	63.5	25.4	13.5	45	32	49.6	4
4500R		4500L		500	516	400	80	63.5	25.4	13.5	45	40	76.3	4

Inserts are not included.

*Please use hexagonal bolt (JIS B1176) M12x30 to 35 mm for securing ø80 cutter to the arbour.

Inserts

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

Grade		Coated Carbide							Carbide				Cermet			Ceramic	CBN	
Application	High Speed/Light	P			K								P	P		K	H	
	General Purpose		PM		K				P	P	K	K			P		H	
	Roughing		PM	PM		K												
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z		A30N	A30	H10E	G10E	T1500A	T1200A	T250A	NB90M	BN250	Fig
CSNH 43M					●	●			●		●	●					—	5
43MT													●	▲	●		—	5
CSN 43M									●			●					—	6
43MT													●	▲	●		●	6
CSNB 43M									●			●					—	7
43MT															●		—	7
SNC 433																	—	—
434																	—	—
SNMN 432										●		●	●	▲			—	8
433						●				●		●			●		—	8
434																	—	8
SNMN 432TN-S																	—	—
433TN-S																	—	—
434TN-S																	—	—
NW 100											●		●	▲			—	9

Fig 5

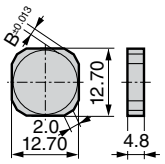


Fig 6

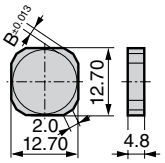


Fig 7

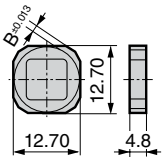


Fig 8

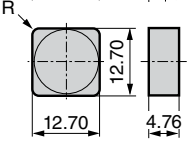
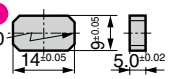


Fig 9

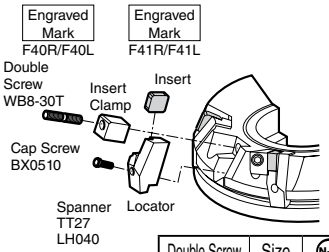
Wiper Insert



Spare Parts

(*1: To use wiper inserts, please change locators to LNFW40R (L). Spanner and cap screw remain unchanged.)

Applicable Cutters	Locator (*1)	Insert Clamp
DNF4080R DNF4100R	LNF40R	FTW40R
DNF4125R to DNF4500R	LNF40R	FTW41R
DNF4080L to DNF4100L	LNF40L	FTW40L
DNF4125L to DNF4500L	LNF40L	FTW41L



Double Screw	Size	N·m
WB8-30T	M8	8.0

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	80-**100**-120	0.10-**0.13**-0.15	T250A
P	Soft 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, cutting depth, and other factors.

▲mark : To be replaced by new item (Please confirm stock availability)

APG4000 Type

Rake Angle		
	Radial	−2°
	Axial	+18°

7mm / 65°

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

General Milling for Aluminium Alloy and Low Carbon Steel

Fig 1

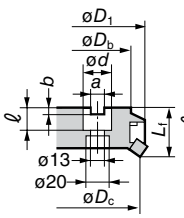


Fig 2

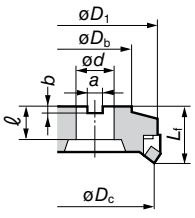


Fig 3

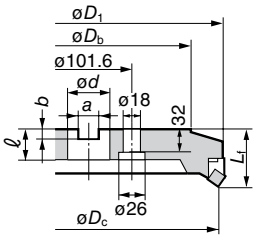
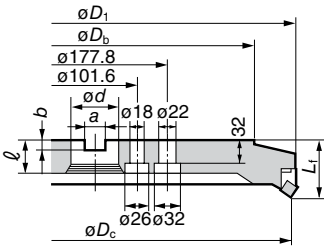


Fig 4



Body

Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
APG 4080R	●	**APG 4080L**		*80	90	60	50	25.4	9.5	6	25	5	1.6	1
4100R	●	**4100L**		100	110	75	60	31.75	12.7	8	32	5	2.7	2
4125R	●	**4125L**		125	134	75	60	38.1	15.9	10	38	6	4.0	2
4160R	●	**4160L**		160	169	100	60	50.8	19.1	11	38	8	6.5	2
4200R	●	**4200L**		200	208	130	60	47.625	25.4	13.5	38	10	9.1	3
APG 4250R	●	**APG 4250L**		250	258	200	70	47.625	25.4	13.5	40	12	18.3	3
4315R	●	**4315L**		315	323	240	70	47.625	25.4	13.5	40	16	27.6	3
4400R		**4400L**		400	408	300	70	63.5	25.4	13.5	45	20		4
4500R		**4500L**		500	508	400	70	63.5	25.4	13.5	45	24		4

Inserts are not included.

*Please use hexagonal bolt (JIS B1176) M12x30 to 35 mm for securing ø80 cutter to the arbour.

Inserts

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

Grade	Coated Carbide						Carbide			Cermet			DLC		SUMIDIA		
Application: High Speed/Light	P			K		M		K N		P	P		N		N	N	
Application: General Purpose		P M	P M	K			P					P	N		N	N	
Application: Roughing		P M	P M		K										N	N	
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	EH20Z	A30N	H1		T1500A	T1200A	T250A	DL1000		DA1000	DA2200	Fig
SDCH 42TR							●						—		—	—	5
42TL													—		—	—	5
42TR-R												●	—		—	—	5
42TL-R													—		—	—	5
SDC 42R								●					●		—	—	6
NF-SDC 42R	—	—	—	—	—	—	—	—		—	—	—	—		●	▲	6
SDC 42L								●					—		—	—	6
42TR							●						—		—	—	6
42TL													—		—	—	6
42TR-R												●	—		—	—	6
42TL-R													—		—	—	6
APW 4R										●	▲		—		●	▲	7

Fig 5

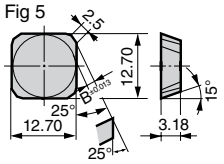


Fig 6

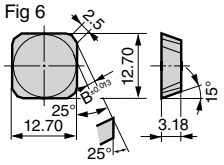
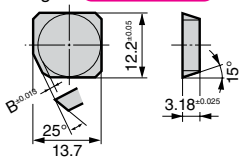


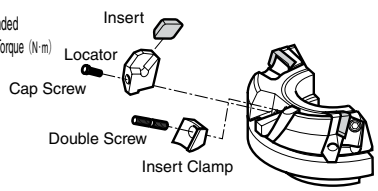
Fig 7 Wiper Insert



Double Screw (Common)	Size	N·m
	M8	8.0

Cap Screw	Size	N·m
	M5	5.0

N·m Recommended Tightening Torque (N·m)



Spare Parts

Applicable Cutters	Locator	Insert Clamp	Double Screw	Cap Screw	Spanner
APG4080R	LAP40R	ATW45R	WB8-20	BXF0520R	TH040
APG4100R to APG4500R	LAP40R	ATW45R	WB8-22TL	BXF0520R	TT27
APG4080L	LAP40L	ATW45L	WB8-20	BXF0520R	TH040
APG4100L to APG4500L	LAP40L	ATW45L	WB8-22T	BXF0520R	TT27

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	100-**125**-150	0.10-**0.18**-0.25	A30N
P	Soft Steel	≤180HB	120-**150**-180	0.10-**0.18**-0.25	A30N
P	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**-1000	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, cutting depth, and other factors.

▲mark : To be replaced by new item (Please confirm stock availability)

DPG4000/DPGF4000 Type

Rake Angle		
	Radial	0°
	Axial	+8°

9.5mm / 75°

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

General Milling for Steel, Stainless Steel & Cast Iron

Fig 1

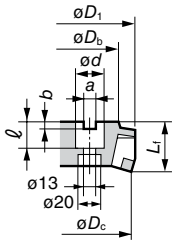


Fig 2

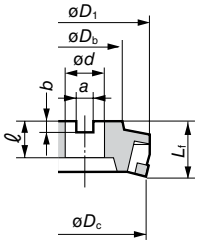
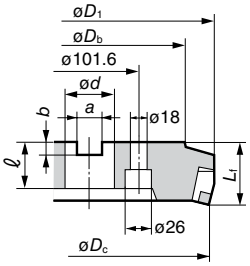


Fig 3



Body

Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
DPG 4080R	●	**DPG 4080L**		***80**	90	60	50	**25.4**	9.5	6	25	4	1.5	1
4100R	●	**4100L**		**105**	115	75	60	**31.75**	12.7	8	32	5	3.0	2
4125R	●	**4125L**		**125**	135	75	60	**38.1**	15.9	10	38	6	4.0	2
4160R	●	**4160L**		**157**	167	100	60	**50.8**	19.1	11	38	8	6.1	2
4200R	●	**4200L**		**200**	210	130	60	**47.625**	25.4	13.5	38	10	10.0	3
DPGF 4080R	●	**DPGF 4080L**		***80**	90	60	50	**25.4**	9.5	6	25	6	1.5	1
4100R	●	**4100L**		**105**	115	75	60	**31.75**	12.7	8	32	8	3.0	2
4125R	●	**4125L**		**125**	135	75	60	**38.1**	15.9	10	38	10	4.0	2
4160R	●	**4160L**		**157**	167	100	60	**50.8**	19.1	11	38	12	6.1	2

Inserts are not included.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm) for securing ø80 cutter to the arbour.

Inserts

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

Grade		Coated Carbide								Carbide				Cermet			
Application	High Speed/Light	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			A30N	A30	H10E	G10E	T1500A	T1200A	T250A	Fig
SPCH 42R					●	●	●						●				5(6)
42L					●	●	▲						●				6
42TR		●	●	●						●		●					5(6)
42TL			●							●							6
42TR-R														●	▲	●	6
42TL-R																●	6
SPMN 422											●		●	●	▲	●	7
423					●	●					●		●	●	▲		7
SPG 422											●		●	●	▲		—
423													●				—
DPW 500R												●		●	▲		8
500L												●					8

Fig 5 (ACP/ACK Series Grades)

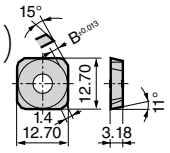


Fig 6

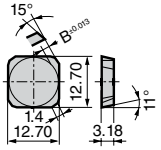


Fig 7

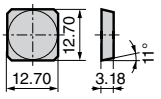
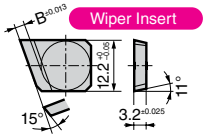
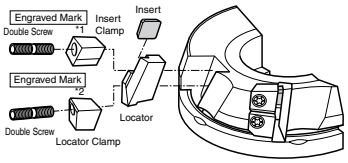


Fig 8



Double Screw (Common)	Size	N·m
	M8	8.0

N·m Recommended Tightening Torque (N·m)



*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

Spare Parts

Applicable Cutters	Locator	Locator Clamp For DPG	Locator Clamp For DPGF	Insert Clamp For DPG	Locator Clamp For DPGF	Double Screw	Spanner
DPG(F)4080R	GL40R	GLW40R	GLWF80R	GTW40R	GTWF80R	WB8-22T	TT27
DPG(F)4100R to DPG(F)4160R		GLW41R	GLWF41R	GTW41R	GTWF41R	WB8-30T	
DPG4200R		GLW42R	—	GTW42R	—	WB8-30T	
DPG(F)4080L	GL40L	GLW40L	GLWF80L	GTW40L	GTWF80L	WB8-22T	TT27
DPG(F)4100L to DPG(F)4160L		GLW41L	GLWF41L	GTW41L	GTWF41L	WB8-30T	
DPG4200L		GLW42L	—	GTW42L	—	WB8-30T	

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c(m/min) Min.- **Optimum** -Max.	Feed Rate f_z(mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	100-**125**-150	0.10-**0.15**-0.20	ACP200
P	Soft 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, cutting depth, and other factors.

▲mark :To be replaced by new item (Please confirm stock availability) to be replaced by the new T1500A.

DPG5000 Type

Rake Angle		
	Radial	0°
	Axial	+8°

12mm / 75°

P (Steel) ○ M (Stainless Steel) ○ K (Cast Iron) ○ N (Non-Ferrous Metal) N (Aluminum) S (Exotic Alloy) H (Hardened Steel)

General Milling for Steel, Stainless Steel & Cast Iron

Fig 1

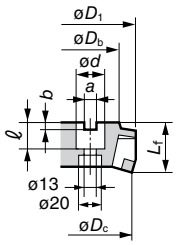


Fig 2

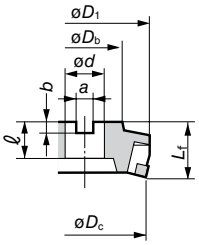


Fig 3

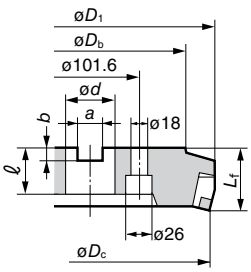
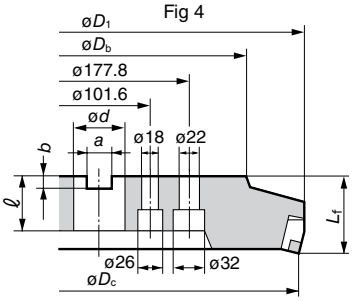


Fig 4



Body

Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
DPG 5080R		**DPG 5080L**		***82**	90	60	50.5	**25.4**	9.5	6	25	4	1.5	1
5100R		**5100L**		**107**	115	75	60.5	**31.75**	12.7	8	32	5	3.0	2
5125R		**5125L**		**127**	135	75	60.5	**38.1**	15.9	10	38	6	4.0	2
5160R		**5160L**		**159**	167	100	60.5	**50.8**	19.1	11	38	8	6.1	2
5200R		**5200L**		**202**	210	130	60.5	**47.625**	25.4	13.5	38	10	10.0	3
DPG 5250R		**DPG 5250L**		**252**	260	200	70.5	**47.625**	25.4	13.5	52	12	19.7	3
5315R		**5315L**		**317**	325	240	70.5	**47.625**	25.4	13.5	52	14	33.0	3
5400R		**5400L**		**402**	410	300	80.5	**63.5**	25.4	13.5	57	20	60.0	4
5500R		**5500L**		**502**	509	400	80.5	**63.5**	25.4	13.5	57	24	92.0	4

Inserts are not included.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm) for securing ø80 cutter to the arbour.

Inserts

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

Grade		Coated Carbide								Carbide				Cermet			
Application	High Speed/Light	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			A30N	A30	H10E	G10E	T1500A	T1200A	T250A	Fig
SPCH 53R-R					●	●	●						●				5
53L-R													●				5
53TR-R		●	●							●		●		●	▲	●	5
53TL-R			●							●		●					5
SPMN 532											●		●				6
533											●		●				6
GW 500R												●		●	▲		7
500L																	7

Fig 5

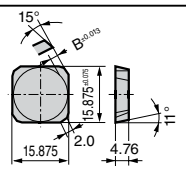


Fig 6

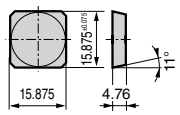
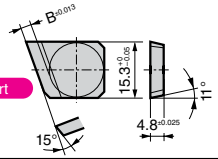


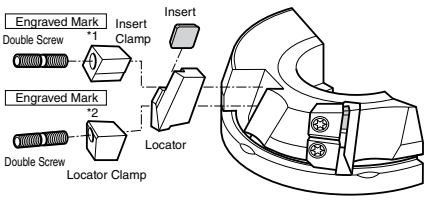
Fig 7



Wiper Insert

Double Screw (Common)	Size	N·m
	M8	8.0

N·m Recommended Tightening Torque (N·m)



*1 Engraved Mark: T50R, T50L, T51R, T51L, T52R, T52L

*2 Engraved Mark: L50R, L50L, L51R, L51L, L52R, L52L

Spare Parts

Applicable Cutters	Locator	Locator Clamp	Insert Clamp	Double Screw	Spanner
DPG5080R	GL50R	GLW50R	GTW50R	WB8-22T	TT27
DPG5100R to DPG5160R		GLW51R	GTW51R	WB8-30T	
DPG5200R to DPG5500R		GLW52R	GTW52R	WB8-30T	
DPG5080L	GL50L	GLW50L	GTW50L	WB8-22T	TT27
DPG5100L to DPG5160L		GLW51L	GTW51L	WB8-30T	
DPG5200L to DPG5500L		GLW52L	GTW52L	WB8-30T	

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	General Steel	180 to 280HB	100-**125**-150	0.10-**0.15**-0.20	ACP200
P	Soft 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, cutting depth, and other factors.

▲mark :To be replaced by new item (Please confirm stock availability) to be replaced by the new T1500A.

SEC-MILL

GRC6000 Type

Rake Angle		
	Radial	+10°
	Axial	+25°

10mm

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

Milling for Stainless Steel, Die Steel & Hard-to-Cut Material

Fig 1

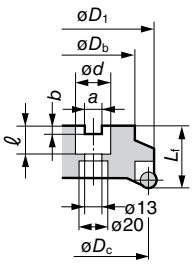


Fig 2

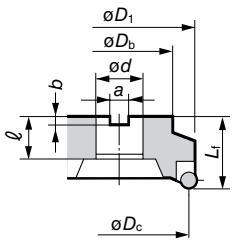
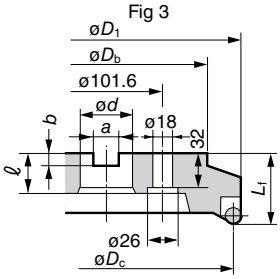


Fig 3



Body

Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
GRC 6080R	●	**GRC 6080L**		***80**	100	60	50	**25.4**	9.5	6	25	4	2.3	1
6100R	●	**6100L**		**100**	119	70	50	**31.75**	12.7	8	32	5	2.9	2
6125R	●	**6125L**		**125**	143	80	63	**38.1**	15.9	10	38	6	5.1	2
6160R	●	**6160L**		**160**	177	100	63	**50.8**	19.1	11	38	8	7.5	2
6200R		**6200L**		**200**	216	130	63	**47.625**	25.4	14	35	10	11.0	3
6250R		**6250L**		**250**	265	130	63	**47.625**	25.4	14	35	12	16.3	3

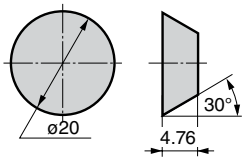
Inserts are not included.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm) for securing ø80 cutter to the arbour.

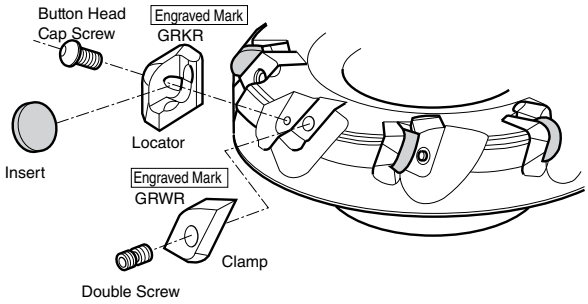
Inserts

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

Grade		Coated Carbide						Carbide							
Application	High Speed/Light	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							
RGEN 2004SN-S			●	●				●							
2004SN-I							●								
2004SN-T							●								



* -S: For Stainless Steel, -I: For Inconel, -T: For Titanium Alloys.



Spare Parts

Applicable Cutters	Locator	Clamp	Double Screw	Locator Screw	Spanner
GRC6080R to GRC6250R	GRKR	GRWR	WB8-22T	BH0410T	TT27 (TT15)
GRC6080L to GRC6250L	GRKL	GRWL	WB8-22T	BH0410T	TT27 (TT15)

Double Screw (Common)	Size	N·m
	M8	8.0

Locator Screw	Size	N·m
	M4	3.0

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (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, cutting depth, and other factors.

BRC Type

Rake Angle		
	Radial	0°
	Axial	0°

0.5mm

P Steel ×, M Stainless Steel ×, K Cast Iron ◎, N Non-ferrous Metal, N Aluminum, S Exotic Alloy ○, H Hardened Steel ◎

Characteristics

- High speed, high efficiency milling of hardened mold material.
- Cost effective with full-top CBN inserts, multiple corner usage.
- Strong clamping with conical insert screw hole design.

Body (Endmill Type)

Fig 1

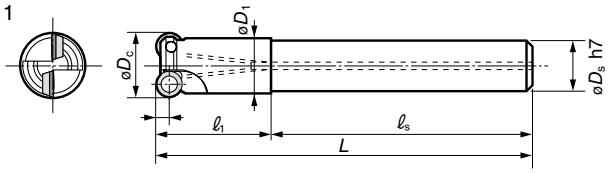


Fig 2

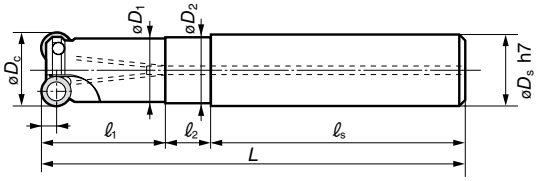
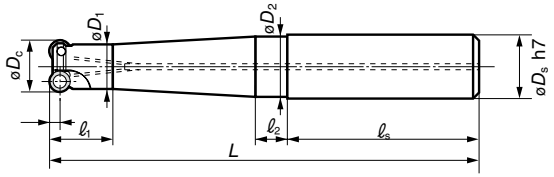


Fig 3

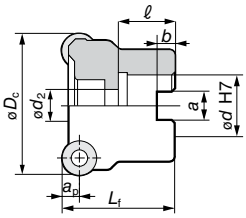


Cat. No.	Stock	Dimensions (mm) øDc	øDs	øD1	øD2	ℓ	ℓ1	ℓ2	ℓs	L	No. of Teeth	Fig	Group No.
BRC 071207ES10	●	12	10	11.0	—	3.5	23	—	52	75	2	1	
071207ES12	●	12	12	11.0	11.5	3.5	22	8	45	75	2	2	
071208ES16	●	12	16	11.0	15.5	3.5	16	8	48	88	2	3	
071210ES16	●	12	16	11.0	15.5	3.5	16	8	48	108	2	3	❶
071212ES16	●	12	16	11.0	15.5	3.5	16	8	48	128	2	3	
071507ES12	●	15	12	12.5	—	3.5	16	—	59	75	3	1	
071507ES16	●	15	16	12.5	13.0	3.5	19	11	48	78	3	2	
BRC 071508ES16	●	15	16	13.5	15.5	3.5	20	8	48	88	2		
071510ES16	●	15	16	13.5	15.5	3.5	20	8	48	108	2		
071513ES20	●	15	20	13.5	19.5	3.5	22	8	50	130	2	3	❷
071515ES20	●	15	20	13.5	19.5	3.5	22	8	50	150	2		
071517ES25	●	15	25	13.5	24.5	3.5	22	8	56	176	2		
BRC 102009ES20	●	20	20	17.0	19.5	5.0	20	8	50	90	2		
102011ES20	●	20	20	17.0	19.5	5.0	22	8	50	110	2		
102012ES25	●	20	25	17.0	24.5	5.0	24	8	56	136	2	3	❸
102015ES25	●	20	25	17.0	24.5	5.0	24	8	56	156	2		
102017ES25	●	20	25	17.0	24.5	5.0	24	8	56	176	2		

Inserts are not included.

Body (Shell Type)

Metric

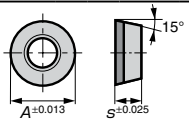


Cat. No.	Stock	Dimensions (mm) øDc	ød	ød2	ap	Lf	ℓ	a	b	No. of Teeth	Group No.
BRC 10042R	●	42	16	9	5	44	20	8.5	6	6	
10052R	●	52	22	11	5	50	30	10.5	7	7	❸
BRC 12042R	●	42	16	9	6	42	20	8.5	6	5	
12052R	●	52	22	11	6	52	30	10.5	7	5	❹
12066R	●	66	27	13	6	52	30	12.5	7	6	

Inserts are not included.

Inserts

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



Grade		CBN		
Application	High Speed/Light		K	K
	General Purpose		S	S
	Roughing	H		

Cat. No.	BN350	BN7000	BN700	Dimensions (mm) A	s	Applicable Endmill (Matching Group No.)
RDHX 0701M0T	●	●	●	7	1.99	❶
0702M0T	●	●	●	7	2.38	❷
1003M0T	●	●	●	10	3.18	❸
12T3M0T	●	●	●	12	3.97	❹

Spare Parts

Screw		Spanner	Applicable Endmill (Matching Group No.)
	N·m		
BFTB 025048	1.0	TRD07	❶
BFTB 02505	1.0	TRD07	❷
BFTB 035074	3.0	TRD15	❸❹

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

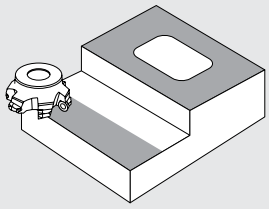
ISO	Work Material	Hardness	Depth of Cut a_p (mm)	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Insert Grade
H	Steel	40 to 45HRC	Up to 0.5	200-**500**-800	0.1-**0.25**-0.4	BN7000
		47 to 55HRC	Up to 0.5	150-**275**-400	0.1-**0.2**-0.3	BN7000
		58 to 62HRC	Up to 0.5	80-**140**-200	0.1-**0.15**-0.2	BN350
K	Grey Cast Iron	Q	Up to 0.5	300-**900**-1500	0.1-**0.25**-0.4	BN7000

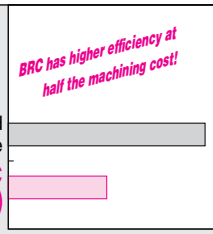
* For BRC Type Cutter/Endmill and RDHX Type Inserts, use in combination with applicable group numbers.

Dry cut (Air Blow) and Down cut are recommended.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

Application Examples





Tool:BRC12052R
Work Material:SNCM435 (Machine Component) 55 to 60HRC
Grade:BN350 v_C=250m/min f_Z=0.1mm/t a_p=0.5mm a_e=50mm

RSX Type

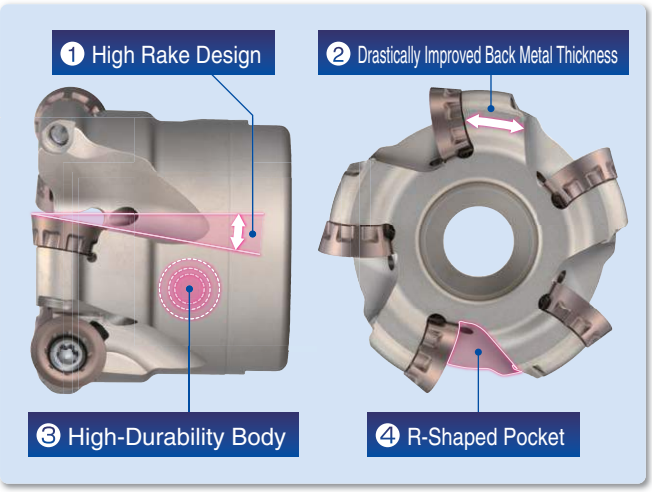
New

■ General Features

SEC-Wave Radius Mill RSX type is a radius cutter for exotic alloy machining that enables stable machining even when using equipment with low clamp rigidity thanks to its body design achieving excellent cutting performance and rigidity.
By employing the ACM Series for stainless steel and exotic alloy machining achieves long tool life in the machining of stainless steel, Inconel, etc. and drastically improves reliability in exotic alloy machining.

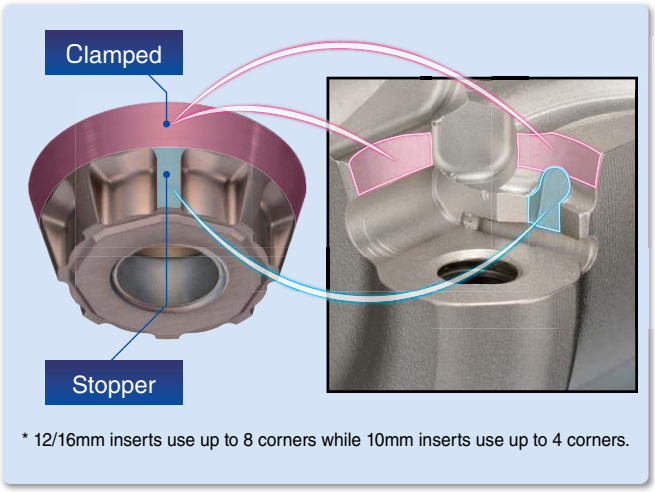
■ Low-Resistance, Low-Vibration Design

Achieves low-resistance, low-vibration machining thanks to ultra-high rake design and high-rigidity body design.



■ Excellent Operability

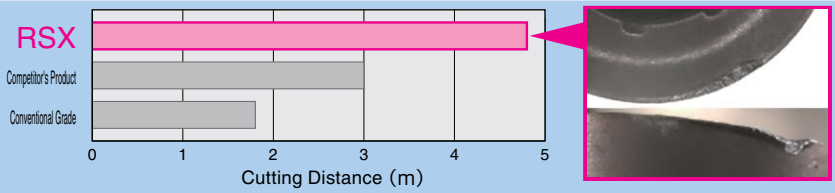
Enables easy corner management with high accuracy and operability by employing our proprietary positioning mechanism.



* 12/16mm inserts use up to 8 corners while 10mm inserts use up to 4 corners.

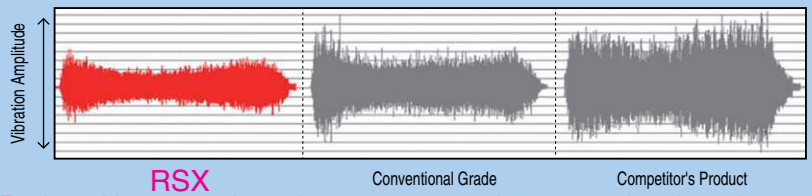
■ Performance

Tool Life Comparison (Fracture Resistance)



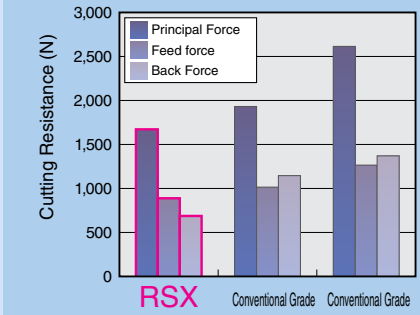
Achieves a tool life that is approximately 1.6 times longer than that of our competitors' products.

Cutting Vibration Comparison



Reduced by approximately 15% compared to competitors' products.

Cutting Resistance Comparison

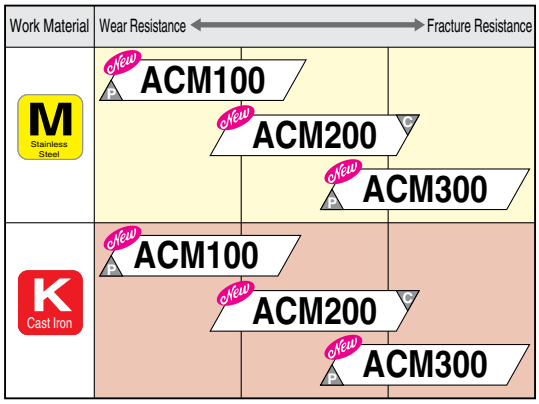


Work Material : SUS304 Tool : φ50
Cutting Conditions : V_c=200m/min, f_z=0.5mm/t
a_p=2.0mm, a_e=10.0mm Wet

RSX Type

■ Stable, Long Tool Life

Achieves long tool life and drastically improves reliability in exotic alloy machining by employing the ACM series, which is a grade for exotic alloy machining.

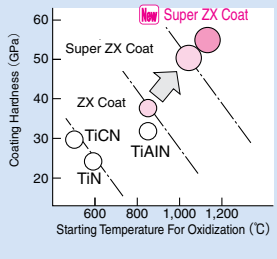


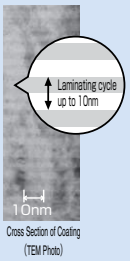
The letters "C" and "P" at either end of each grade indicate coating type.

▽: CVD △: PVD Blank: Non-coated

P ACM100/ACM300

NEW Super ZX Coat

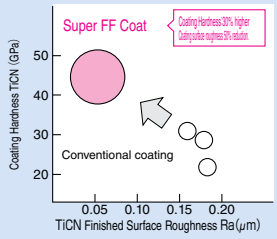


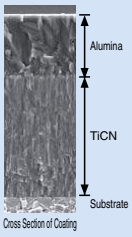


- Compared to conventional grades, the coating hardness has been increased by 40% and the oxidization starting temperature has been increased by 200°C.
- High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible.
- Achieves over 2 times longer tool life compared to conventional grades under the same cutting conditions.

C ACM200

Super FF Coat



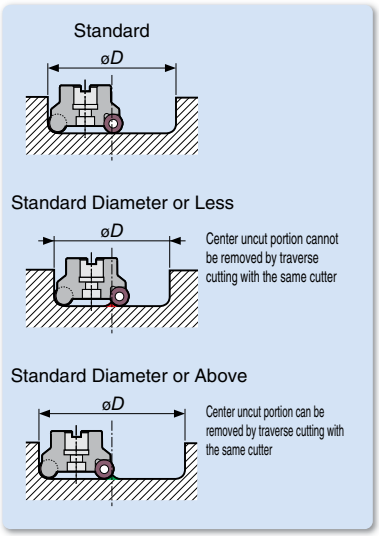


- Achieves excellent chipping resistance thanks to the smoothness of the coating and our coating stress control technology.
- High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible. by hardening the coating layer.
- Achieves over 2 times longer tool life compared to conventional grades under the same cutting conditions.

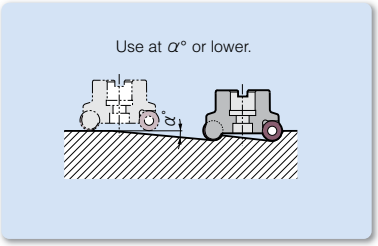
■ Various Applications

Applicable to various types of machining such as carving, slant milling, and helical milling of dies.

Helical Milling



Taper Milling



Recommended Values for Helical and Taper Milling

Insert Cat. No.	Helical (Dimensions mm)				Taper
	Cutter External Diameter øDc	Work Dia øD			Max. Ramping Angle
		Min.	Standard	Max.	α° (max)
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’

■ Series

Type		Insert Size	Cat No.	External (mm) ø25	ø32	ø40	ø50	ø52	ø63	ø66	ø80	ø100	ø125	ø160
Shell Type	Standard	10	RSX 10000 RS			●	●	●						
		12	RSX 12000 RS/R			●	●	●	●	●	◉	◉		
		16	RSX 16000 RS/R						●		◉	◉	◉	
H55	Fine Pitch	10	RSXF 10000 RS			●	●	●						
		12	RSXF 12000 RS/R			●	●	●	●	●	◉	◉		
		16	RSXF 16000 RS/R						●		◉	◉	◉	○
Shank Type	Standard	10	RSX 10000 ES	●	●									
		12	RSX 12000 ES		●									
H58	Fine Pitch	10	RSXF 10000 ES	●	●									
		12	RSXF 12000 ES		●									
Modular Type	Standard	10	RSX 10000 M	●	●									
		12	RSX 12000 M		●	●								
H128	Fine Pitch	10	RSXF 10000 M	●	●									
		12	RSXF 12000 M		●	●								

● : Only metric in stock, ◉ : Both metric and imperial in stock, ○ : Made-to-order for both metric and imperial, Blank: Not available

RSX Type

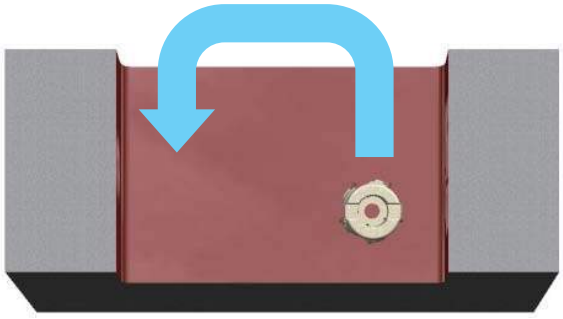
New

■ Application Examples

●Power Generator Component / X12

		RSX Type	Competitor's Product
Tool	Target		
	Body	RSXF12050RS	φ50 Cutter
	Insert	RDET1204M0EN-G	φ12
	External （mm）	φ50	φ50
	No. of Teeth	5	5
	Insert	ACM300（PVD）	（CVD）
Cutting Conditions	Cutting Speed (m/min)	300	300
	Feed (mm/t)	0.35	0.35
	Axial Cutting Depth (mm)	2.0	2.0
	Radial Cutting Depth （mm）	50.0	50.0
	Dry／Wet	Air Blow	Air Blow
Results	Provides a tool life that is approximately 1.2 times longer than that of our competitors' products.		

●Power Generator Component / X22



		RSX Type	Competitor's Product
Tool	Target		
	Body	RSX12050RS	φ50 Cutter
	Insert	RDET1204M0EN-G	φ12
	External	φ50	φ50
	No. of Teeth	5	5
	Insert	ACM300（PVD）	（CVD）
Cutting Conditions	Cutting Speed (m/min)	300	300
	Feed (mm/t)	0.3	0.3
	Axial Cutting Depth (mm)	2.0	2.0
	Radial Cutting Depth （mm）	50.0	50.0
	Dry／Wet	Air Blow	Air Blow
Results	Provides a tool life that is approximately 1.2 times longer than that of our competitors' products.		

RSX(F)10000RS Type

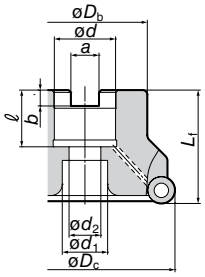
Rake Angle		
	Radial	−5°
	Axial	10°

5mm

P (Steel) ◎ | M (Stainless Steel) ◎ | K (Cast Iron) | N (Non-Ferrous Metal) | N (Aluminum) | S (Exotic Alloy) ◎ | H (Hardened Steel)

Milling for Stainless Steel, Die Steel & Hard-to-Cut Material

New



■ Body (RSX10000RS)

	Cat. No.	Stock	Dimensions(mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)
Metric	RSX 10040RS	●	40	34	40	16	8.4	5.6	18	14	9	4	0.2
	10050RS	●	50	40	40	22	10.4	6.3	20	18	11	5	0.3
	10052RS	●	52	40	40	22	10.4	6.3	20	18	11	5	0.4

■ Body (RSXF10000RS) Fine Pitch Type

	Cat. No.	Stock	Dimensions(mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)
Metric	RSXF 10040RS	●	40	34	40	16	8.4	5.6	18	14	9	5	0.2
	10050RS	●	50	40	40	22	10.4	6.3	20	18	11	6	0.3
	10052RS	●	52	40	40	22	10.4	6.3	20	18	11	6	0.3

Inserts are not included. Check the collet attachment size (ød) when selecting the cutter.

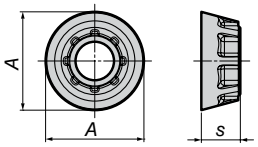
■ Identification Details

RSX	F	10	040	R	S
(1) Cutter Series	(2) Fine-Pitch Indication	(3) Insert Size	(4) Cutter	(5) Direction	(6) Metric Bore

■ Insert

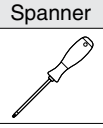
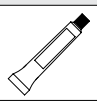
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel

Grade		Coat				
Application	High Speed/Light	MS	MS			
	General Purpose	MS	MS	MS		
	Roughing			MS		
Cat. No.		New ACM100	New ACM200	New ACM300	Dimensions A	s
RDET 10T3M0EN-G		●	●	●	10	3.97
10T3M0EN-H		●	●	●	10	3.97



●Cross Section of Cutting Edge

■ Spare Parts

Spanner	screw		Anti-seizure Cream
		N·m	
TRDR15IP	BFTX03584IP	3.0	SUMI-P

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

ISO	Work Material			Hardness	Cutting Speed v_c(m/min) Min.-Optimum-Max.	Feed Rate f_z(mm/t) Min.-Optimum-Max.	Insert Grade
M	Stainless Steel	Cr	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	Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
			2 Phase Structures (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
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	
			α+β Alloy	(Rm1050)	40-**50**-60	0.10-**0.20**-0.30	

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

RSX(F)12000R(S) Type

Rake Angle		
	Radial	−5°
	Axial	10°

6mm

P Steel | M Stainless Steel ◎ | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy ◎ | H Hardened Steel

Milling for Stainless Steel, Die Steel & Hard-to-Cut Material

New

Fig 1

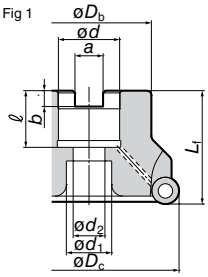


Fig 2

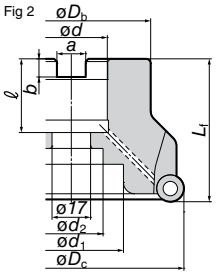
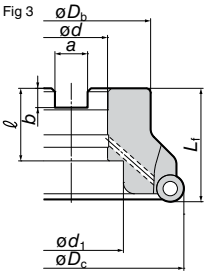


Fig 3



Body (RSX12000)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Metric	RSX 12040RS	●	40	32	40	16	8.4	5.6	18	13.5	9	3	0.2	1
	12050RS	●	50	40	40	22	10.4	6.3	20	18	11	4	0.3	1
	12052RS	●	52	40	40	22	10.4	6.3	20	18	11	4	0.3	1
	12063RS	●	63	40	40	22	10.4	6.3	20	18	11	5	0.4	1
	12066RS	●	66	55	50	27	12.4	7.0	25	20	14	6	0.7	1
	12080RS	●	*80	55	50	27	12.4	7.0	25	20	14	6	1.0	1
	12100RS	●	100	70	50	32	14.4	8.5	32	46	-	6	1.4	3
Imperial	RSX 12080R	●	*80	55	50	25.4	9.5	6.0	25	20	13	6	1.0	1
	12100R	●	*100	70	63	31.75	12.7	8.0	32.5	46	28	6	1.9	2

Body (RSXF12000) Fine Pitch Type

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Metric	RSXF 12040RS	●	40	32	40	16	8.4	5.6	18	13.5	9	4	0.2	1
	12050RS	●	50	40	40	22	10.4	6.3	20	18	11	5	0.3	1
	12052RS	●	52	40	40	22	10.4	6.3	20	18	11	5	0.3	1
	12063RS	●	63	40	40	22	10.4	6.3	20	18	11	6	0.4	1
	12066RS	●	66	55	50	27	12.4	7.0	25	20	14	7	0.7	1
	12080RS	●	*80	55	50	27	12.4	7.0	25	20	14	7	0.9	1
	12100RS	●	100	70	50	32	14.4	8.5	32	46	-	10	1.3	3
Imperial	RSXF 12080R	●	*80	55	50	25.4	9.5	6.0	25	20	13	7	1.0	1
	12100R	●	*100	70	63	31.75	12.7	8.0	32.5	46	28	10	1.8	2

Inserts are not included. Check the collet attachment size (ød) when selecting the cutter.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

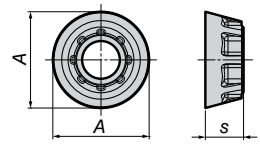
Identification Details

RSX	F	12	040	R	S
(1) Cutter Series	(2) Fine-Pitch Indication	(3) Insert Size	(4) Cutter	(5) Direction	(6) Metric Bore

Inserts

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

Grade		Coat				
Application	High Speed/Light	MS	MS			
	General Purpose	MS	MS	MS		
	Roughing			MS		
Cat. No.		New ACM100	New ACM200	New ACM300	Dimensions A	s
RDET 1204M0EN-G		●	●	●	12	4.76
1204M0EN-H		●	●	●	12	4.76



●Cross Section of Cutting Edge

G Type H Type

Spare Parts

Spanner	screw		Anti-seizure Cream
		N·m	
TRDR15IP	BFTX0409IP	3.0	SUMI-P

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material			Hardness	Cutting Speed V_c(m/min) Min.- Optimum - Max.	Feed Rate f_z(mm/t) Min.- Optimum - Max.	Insert Grade
M	Stainless Steel	Cr	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	Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
			2 Phase Structures (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
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	
			α+β Alloy	(Rm1050)	40- **50** - 60	0.10-**0.20**-0.30	

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

RSX(F)16000R(S) Type

Rake Angle		
	Radial	−5°
	Axial	10°

8mm

P Steel | M Stainless Steel ◎ | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy ◎ | H Hardened Steel

Milling for Stainless Steel, Die Steel & Hard-to-Cut Material

New

Fig 1

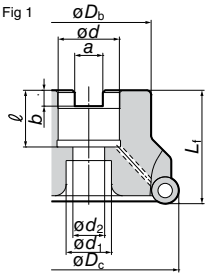


Fig 2

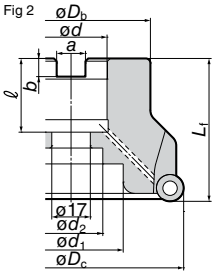


Fig 3

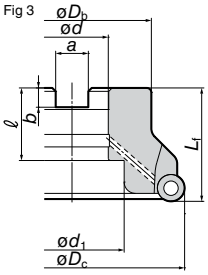


Fig 4

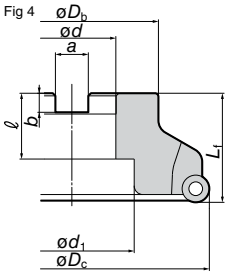
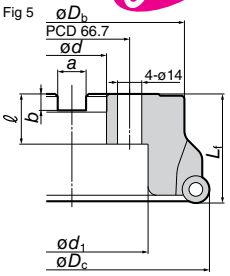


Fig 5



Body (RSX16000)

	Cat. No.	Stock	Dimensions(mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Metric	RSX 16063RS	●	63	50	40	22	10.4	6.3	20	18	11	4	0.5	1
	16080RS	●	*80	55	50	27	12.4	7.0	25	20	14	5	0.9	1
	16100RS	●	100	70	50	32	14.4	8.5	32	46	-	6	1.3	3
	16125RS	●	125	80	63	40	16.4	9.5	29	52	29	6	2.6	1
Imperial	RSX 16080R	●	*80	55	50	25.4	9.5	6.0	25	20	13	5	0.9	1
	16100R	●	*100	70	63	31.75	12.7	8.0	32.5	46	28	6	1.8	2
	16125R	●	125	80	63	38.1	15.9	10.0	35.5	55	30	6	2.7	1

Body (RSXF16000) Fine Pitch Type

	Cat. No.	Stock	Dimensions(mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Metric	RSXF 16063RS	●	63	50	40	22	10.4	6.3	20	18	11	5	0.4	1
	16080RS	●	*80	55	50	27	12.4	7.0	25	20	14	6	0.8	1
	16100RS	●	100	70	50	32	14.4	8.5	32	46	-	7	1.3	3
	16125RS	●	125	80	63	40	16.4	9.5	29	52	29	8	2.5	1
	16160RS		160	130	63	40	16.4	9.5	29	88	-	10	4.8	5
Imperial	RSXF 16080R	●	*80	55	50	25.4	9.5	6.0	25	20	13	6	0.8	1
	16100R	●	*100	70	63	31.75	12.7	8.0	32.5	46	28	7	1.7	2
	16125R	●	125	80	63	38.1	15.9	10.0	35.5	55	30	8	2.6	1
	16160R		160	100	63	50.8	19.1	11.0	38	72	-	10	4.3	4

Inserts are not included. Check the collet attachment size (ød) when selecting the cutter.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

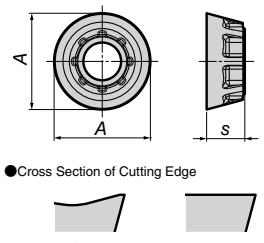
Identification Details

RSX	F	16	063	R	S
(1) Cutter Series	(2) Fine-Pitch Indication	(3) Insert Size	(4) Cutter	(5) Direction	(6) Metric Bore

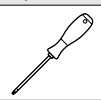
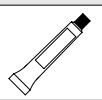
Inserts

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

Grade		Coat				
Application	High Speed/Light	MS	MS			
	General Purpose	MS	MS	MS		
	Roughing			MS		
Cat. No.		New ACM100	New ACM200	New ACM300	Dimensions A	s
RDET 1606M0EN-G		●	●	●	16	6.5
1606M0EN-H		●	●	●	16	6.5



Spare Parts

Spanner	screw		Anti-seizure Cream
		N·m	
TRDR20IP	BFTX0511IP	5.0	SUMI-P

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material			Hardness	Cutting Speed v_c(m/min) Min.- Optimum - Max.	Feed Rate f_z(mm/t) Min.- Optimum - Max.	Insert Grade
M	Stainless Steel	Cr	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	Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
			2 Phase Structures (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
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	
			α+β Alloy	(Rm1050)	40- **50** - 60	0.10-**0.20**-0.30	

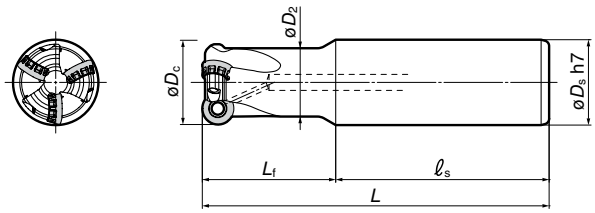
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

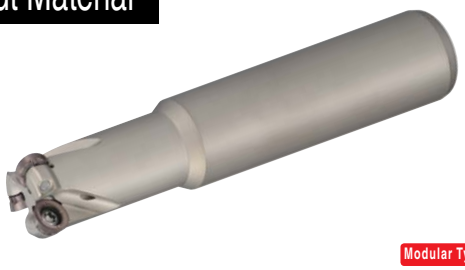
RSX(F)10000ES/12000ES Type

Rake Angle		
Radial	-5°to-8°	5mm (10000ES Type)
Axial	10°	6mm (12000ES Type)

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy ◎ | H Hardened Steel

Milling for Stainless Steel, Die Steel & Hard-to-Cut Material





New

Modular Type ☞ H128

■ Body (RSX10000ES) Applicable Insert A=10mm Type

Cat. No.	Stock	Dimensions(mm) øDc	øDs	øD2	Lf	ℓs	L	No. of Teeth	Weight (kg)
RSX 10025ES	●	25	25	20.3	50	80	130	2	0.4
10032ES	●	32	32	27.1	50	80	130	3	0.7

■ Body (RSX12000ES) Applicable Insert A=12mm Type

Cat. No.	Stock	Dimensions(mm) øDc	øDs	øD2	Lf	ℓs	L	No. of Teeth	Weight (kg)
RSX 12032ES	●	32	32	25.6	50	80	130	2	0.7

■ Body (RSXF10000ES) Fine Pitch Type Applicable Insert A=10mm Type

Cat. No.	Stock	Dimensions(mm) øDc	øDs	øD2	Lf	ℓs	L	No. of Teeth	Weight (kg)
RSXF 10025ES	●	25	25	20.3	50	80	130	3	0.4
10032ES	●	32	32	27.1	50	80	130	4	0.7

■ Body (RSXF12000ES) Fine Pitch Type Applicable Insert A=12mm Type

Cat. No.	Stock	Dimensions(mm) øDc	øDs	øD2	Lf	ℓs	L	No. of Teeth	Weight (kg)
RSXF 12032ES	●	32	32	25.6	50	80	130	3	0.7

■ Identification Details

RSX F 10 025 ES

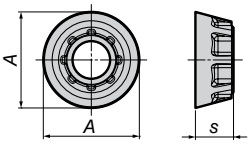
(1) Cutter Series | (2) Fine-Pitch Indication | (3) Insert Size | (4) Cutter | (5) Endmill Type

■ Insert

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

Grade		Coat
Application	High Speed/Light	MS MS
	General Purpose	MS MS MS
	Roughing	MS

Cat. No.	New ACM100	New ACM200	New ACM300	Dimensions A	s	Applicable Cutter
RDET 10T3M0EN-G	●	●	●	10	3.97	RSX(F)10000ES Type
10T3M0EN-H	●	●	●	10	3.97	
RDET 1204M0EN-G	●	●	●	12	4.76	RSX(F)12000ES Type
1204M0EN-H	●	●	●	12	4.76	



●Cross Section of Cutting Edge

■ Spare Parts

Applicable Cutter	Spanner	screw		Anti-seizure Cream
RSX(F)10000ES Type	TRDR15IP	BFTX03584IP	3.0	SUMI-P
RSX(F)12000ES Type		BFTX0409IP	3.0	

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

ISO	Work Material			Hardness	Cutting Speed V_c(m/min) Min.-Optimum-Max.	Feed Rate f_z (mm/t) Min.-Optimum-Max.	Insert Grade
M	Stainless Steel	Cr	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	Austenitic	200HB	150-**180**-200	0.15-**0.25**-0.35	ACM300
			2 Phase Structures (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
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	
			α+β Alloy	(Rm1050)	40-**50**-60	0.10-**0.20**-0.30	

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

●mark: Standard stocked item

WRCX Type

General Features

The popular WRC type has been redesigned.
The WRCX Type SEC WaveRadius Mill is a versatile, high efficiency cutter that is suited to carving dies, slant milling, helical milling, and a variety of other applications.
A full lineup of inserts allows it to handle a wide variety of work materials from steel to non-ferrous metals.

Characteristics

- Durable body with special surface treatment offers significantly improved tool life and reliability.
- Superb vibration resistance with anti-vibration edge design.
- All sizes come with coolant holes preventing chip build-up and jamming.
- Sturdy screw clamp with torx plus insert attachment ensures stable machining.

Series

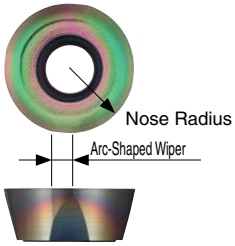
	Type	External (mm)	No. of Teeth
Shell Type	**WRCX(F) 12000R(S)**	ø40-ø80	4-6
	WRCX(F) 16000R(S)	ø63-ø100	3-6
H60	**WRCX 20000R(S)**	ø125-ø160	5-6
Endmill Type	**WRCX 08000E**	ø20-ø25	2-3
	WRCX 10000E	ø25-ø32	2-3
H63	**WRCX 16000E**	ø40-ø50	2-3
Modular Type	**WRCX 08000M**	ø20-ø25	2-3
	WRCX 10000M	ø25-ø32	2-3
H131	**WRCX 12000M**	ø40	4

Wide Insert Lineup

- In addition to conventional WRC type inserts, the new lineup includes non-ferrous metal inserts and surfing inserts.

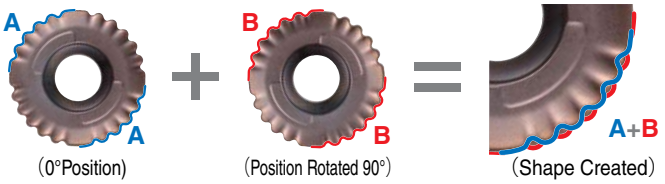
Non-Ferrous Metal Insert QPET ○○○○○○ PPFR-S

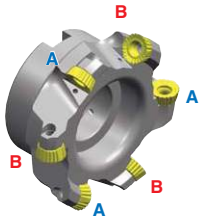
- Good surface roughness with arc-shaped wiper
- Sharp corners
- Four-cornered insert



Surfing Insert QPMT ○○○○○○ PPER-R

- Cutting edges feature unique rippled design
- Four-cornered insert
- *Use in combinations that alternate cutting edge A and cutting edge B.
  (Only useable on cutters with an even number of cutting edges)





Rotate 90°at a time and attach inserts

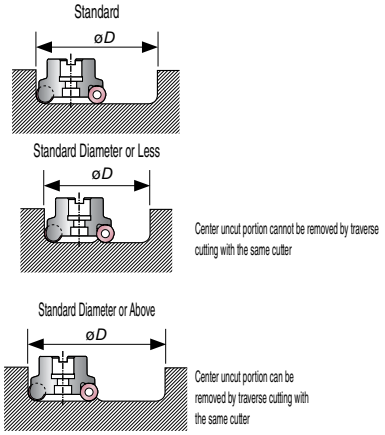
● Maximum Allowable Revolution Speed when Milling Non-Ferrous Metal (Units: min^{-1})

Cutter External Diameter $øD_C$(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

* Even if the speed used is within the maximum allowable revolution speeds listed above, abnormal vibrations may occur due to machine rigidity or other factors.
Therefore it is advisable to start operation at half the maximum allowable revolution speed and increase the speed gradually while checking for abnormalities.

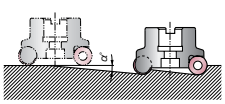
Usage Precautions

● Helical Milling



● Taper Milling

●Use at α°or lower.



● Recommended Values for Helical and Taper Milling

Insert Cat. No.	Helical (Dimensions mm)				Taper
	Cutter External Diameter	Work Dia. øD			Max. Ramping Angle
	$øD_C$	Min.	Standard	Max.	α°(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'

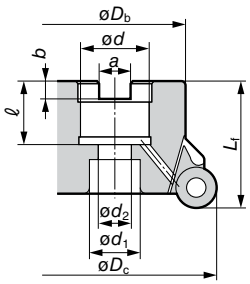
WRCX(F)12000 Type

Rake Angle		
	Radial	0°
	Axial	−3°

6mm (12000 Type)

P Steel ◎ | M Stainless Steel ○ | K Cast Iron ◎ | N Non-Ferrous Metal | N Aluminum ◎ | S Exotic Alloy | H Hardened Steel

Milling for Steel, Stainless Steel, Cast Iron and Non-Ferrous Alloys



■ Body (WRCX12000)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)
Metric	WRCX 12040RS	●	40	36	40	16	8.4	5.6	18	13.5	9	4	0.2
	12050RS	●	50	40	40	22	10.4	6.3	20	18	11	4	0.2
	12063RS	●	63	40	40	22	10.4	6.3	20	18	11	5	0.4
	12080RS	●	*80	55	50	27	12.4	7.0	25	20	13.5	6	0.9

Inserts are not included.

■ Body (WRCXF12000) Fine Pitch Type

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)
Metric	WRCXF 12050RS	●	50	40	40	22	10.4	6.3	20	18	11	5	0.2
	12063RS	●	63	40	40	22	10.4	6.3	20	18	11	6	0.4

Inserts are not included.

*Please use JIS B1176 hexagonal bolt for securing cutter to the arbour.

■ Inserts

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

Grade		Coat					Carbide		DLC		Usage	Cat. No.	Dimensions (mm) A	rε	s	Fig
		ACP100	ACP200	ACP300	ACK200	ACK300	H1		DL1000							
Application	High Speed/Light	P			K		K/N		N		General Purpose *1	QPMT 120440 PPEN	12	4.0	4.76	1
	General Purpose		P/M	P/M	K				N			120440 PPEN-H	12	4.0	4.76	1
	Roughing		P/M	P/M		K					Non-Ferrous Metal	QPET 120460 PPFR-S	12	6.0	4.76	2
											Surfing	QPMT 120460 PPER-R	12	6.0	4.76	3

Fig 1

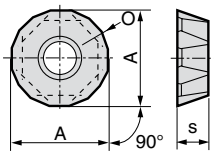


Fig 2 Non-Ferrous Metal

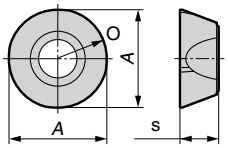
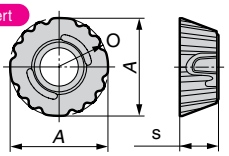


Fig 3 Surfing Insert



*H: Strong edge.

■ Spare Parts

screw		Spanner	Anti-seizure Cream
			
BFTX0409IP	3.0	TRDR15IP	SUMI-P

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

External Diameter: ø40 to ø80mm

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min.- **Optimum** -Max.	Feed Rate fz (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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 Metal	—	200-**500**-1000	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, cutting depth, and other factors.

Rake Angle	Radial	0°
	Axial	−3°

8mm (16000 Type)

P Steel ◎ | M Stainless Steel ○ | K Cast Iron ◎ | N Non-Ferrous Metal | N Aluminum ◎ | S Exotic Alloy | H Hardened Steel

SEC-WaveRadius Mill

WRCX(F)16000 Type

Milling for Steel, Stainless Steel, Cast Iron and Non-Ferrous Alloys

Fig 1

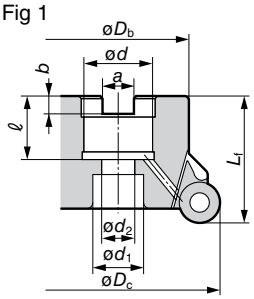
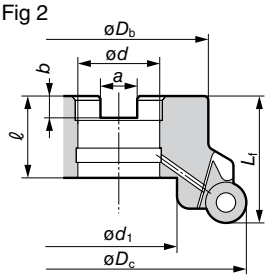


Fig 2



■ Body (WRCX16000)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Metric	WRCX 16063RS	●	63	50	40	22	10.4	6.3	20	18	11	3	0.4	1
	16080RS	●	*80	55	50	27	12.4	7.0	25	20	13.5	4	0.8	1
	16100RS	●	100	70	50	32	14.4	8.5	32	46	—	5	1.2	2
Imperial	WRCX 16080R	●	*80	55	50	25.4	9.5	6.0	25	20	13	4	0.8	1
	16100R	●	*100	70	63	31.75	12.7	8.0	32	46	17	5	1.4	1

Inserts are not included.

■ Body (WRCXF16000) Fine Pitch Type

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Metric	WRCXF 16063RS	●	63	50	40	22	10.4	6.3	20	18	11	4	0.4	1
	16080RS	●	*80	55	50	27	12.4	7.0	25	20	13.5	5	0.7	1
	16100RS	●	100	70	50	32	14.4	8.5	32	46	—	6	1.2	2

Inserts are not included.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

■ Inserts

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

Grade		Coated Carbide					Carbide		DLC		Dimensions (mm)			Fig
Application	Usage	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1		DL1000		A	rε	s	
High Speed/Light			P			K		N		N					
General Purpose				P M	P M	K				N					
Roughing				P M	P M		K								
General Purpose *1		QPMT 160660 PPEN		●	●	●	●	—		—		16	6.0	6.5	1
		160660 PPEN-H		●	●	●	●	—		—		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-FerrousMetal		QPET 160680 PPFR-S	—	—	—	—	—	●		●		16	8.0	6.5	3
Surfing		QPMT 160680 PPER-R		●	●			—		—		16	8.0	6.5	4

Fig 1

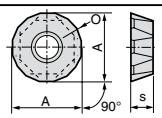


Fig 2 (CP Type)

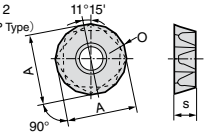


Fig 3 Non-Ferrous Metal

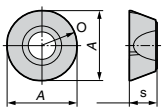
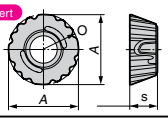
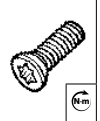
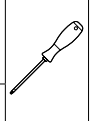
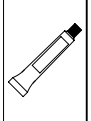


Fig 4 Surfing Insert



*1 -H: Strong edge. *2: When using anti-vibration inserts, 08 type and 08-CP type inserts must be set in alternating fashion.

■ Spare Parts

screw	Spanner	Anti-seizure Cream
		
BFTX0511IP 5.0	TRDR20IP	SUMI-P

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

External Diameter: ø40 to ø80mm

ISO	Work Material	Hardness	Cutting Speed Vc (m/min) Min.- **Optimum** -Max.	Feed Rate fz (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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 Metal	–	200-**500**-1000	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, cutting depth, and other factors.

External Diameter: ø100 to ø160mm

ISO	Work Material	Hardness	Cutting Speed Vc (m/min) Min.- **Optimum** -Max.	Feed Rate fz (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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 Metal	–	200-**500**-1000	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, cutting depth, and other factors.

SEC-Wave Radius Mill

WRCX20000 Type

Rake Angle		
	Radial	0°
	Axial	−3°

10mm (20000 Type)

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Met | N Aluminum | S Exotic Alloy | H Hardened Steel

Milling for Steel, Stainless Steel, Cast Iron and Non-Ferrous Alloys

Fig 1

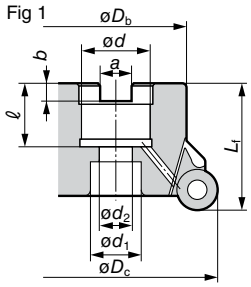
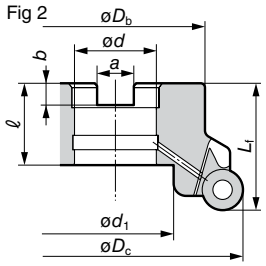


Fig 2



■ Body (WRCX20000)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Imperial	**WRCX 20125R**	●	**125**	80	63	**38.1**	15.9	10.0	35.5	55	30	5	2.3	1
	20160R	●	**160**	100	63	**50.8**	19.1	11.0	38	72	—	6	4.0	2

Inserts are not included.

■ Inserts

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

Grade		Coated Carbide				Cermet		DLC					
Application	High Speed/Light	P			K	K N		N					
	General Purpose		P M	P M	K			N					
	Roughing		P M	P M		K							

Usage	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1		DL1000		Dimensions (mm) A	rε	s	Fig
General Purpose *1	**QPMT 200670 PPEN**		●	●	●	●	—		—		20	7.0	6.5	1
	200670 PPEN-H		●	●	●	●	—		—		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

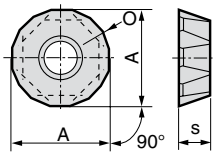


Fig 2 (CP Type)

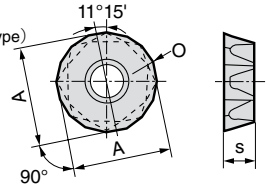
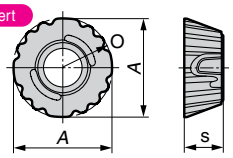


Fig 3

Surfing Insert



*1 -H: Strong edge. *2: When using anti-vibration inserts, 08 type and 08-CP type inserts must be set in alternating fashion.

■ Spare Parts

screw		Spanner	Anti-seizure Cream
	N·m		
BFTX0615IP	7.5	TRDR25IP	SUMI-P

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

External Diameter: ø100 to ø160mm

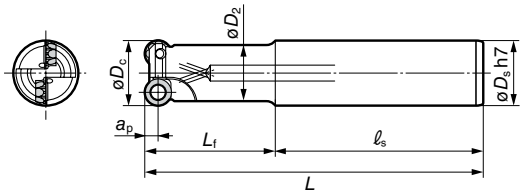
ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	180 to 280HB	150-**200**-250	0.30-**0.40**-0.60	ACP200
	Alloy Steel	180 to 280HB	100-**160**-200	0.10-**0.30**-0.50	ACP200
M	Stainless Steel	—	160-**180**-200	0.15-**0.20**-0.30	ACP300
K	Cast Iron	250HB	100-**150**-200	0.10-**0.15**-0.20	ACK200

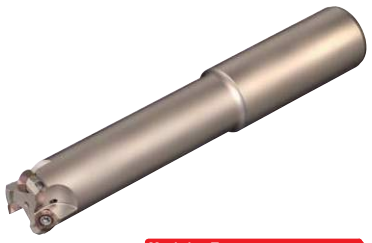
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

SEC-Wave Radius Mill

WRCX08000E/10000E/16000E Type

Milling for Steel, Stainless Steel, Cast Iron and Non-Ferrous Alloys





Modular Type → H131

■ Body (WRCX08000E) Insert: A=8 Type

Cat. No.	Stock	Dimensions(mm) øDc	øDs	øD2	ap	Lf	ℓs	L	No. of Teeth	Weight (kg)
WRCX 08020ES	●	20	20	18	4	50	80	130	2	0.2
08020EM	●	20	20	18	4	100	80	180	2	0.3
08020EL		20	20	18	4	130	120	250	2	0.5
WRCX 08025ES	●	25	25	21	4	50	80	130	3	0.4
08025EM	●	25	25	21	4	100	80	180	3	0.5
08025EL		25	25	21	4	130	120	250	3	0.7

Inserts are not included.

■ Body (WRCX10000E) Insert: A=10 Type

Cat. No.	Stock	Dimensions (mm) øDc	øDs	øD2	ap	Lf	ℓs	L	No. of Teeth	Weight (kg)
WRCX 10025ES	●	25	25	21	5	50	80	130	2	0.4
10025EM	●	25	25	21	5	100	80	180	2	0.5
10025EL		25	25	21	5	130	120	250	2	0.7
WRCX 10032ES	●	32	32	28	5	50	80	130	3	0.7
10032EM	●	32	32	28	5	120	80	200	3	1.0
10032EL		32	32	28	5	180	120	300	3	1.5

Inserts are not included.

■ Body (WRCX16000E) Insert: A=16 Type

Cat. No.	Stock	Dimensions (mm) øDc	øDs	øD2	ap	Lf	ℓs	L	No. of Teeth	Weight (kg)
WRCX 16040ES	●	40	32	31.3	8	50	120	170	2	0.9
16040EM	●	40	32	31.3	8	50	200	250	2	1.4
WRCX 16050ES	●	50	32	40.8	8	50	120	170	3	1.0
16050EM	●	50	32	40.8	8	50	200	250	3	1.5

Inserts are not included.

■ Spare Parts

Applicable Cutters	Screw	(N·m)	Spanner
WRCX08000E Type	BFTX02506IP	1.5	TRDR08IP
WRCX10000E Type	BFTX03584IP	3.0	TRDR15IP
WRCX16000E Type	BFTX0511IP	5.0	TRDR20IP

(N·m) Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

External Diameter: ø20 to ø32mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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 Metal	–	200-**500**-1000	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, cutting depth, and other factors.

External Diameter: ø40 to ø50mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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 Metal	–	200-**500**-1000	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, cutting depth, and other factors.

■ Inserts

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

Usage	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Dimensions (mm) A	r_ε	s	Fig	Applicable Cutters
Application: High Speed/Light	P K N				K	K N		N					
Application: General Purpose	PM PM K		PM	PM	K			N					
Application: Roughing	PM PM K		PM	PM		K							
General Purpose	QPMT 080330 PPEN		●	●	●	●	—	—	8	3.0	3.18	1	WRCX08000E Type
	080330 PPEN-H		●	●	●	●	—	—	8	3.0	3.18	1	
	QPMT 10T335 PPEN		●	●	●	●	—	—	10	3.5	3.97	1	WRCX10000E Type
	10T335 PPEN-H		●	●	●	●	—	—	10	3.5	3.97	1	
	QPMT 160660 PPEN		●	●	●	●	—	—	16	6.0	6.5	1	WRCX16000E Type
*1	160660 PPEN-H		●	●	●	●	—	—	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 Metal	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

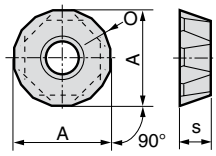


Fig 2 (CP Type)

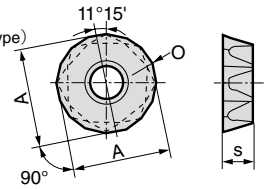


Fig 3 Non-Ferrous Metal

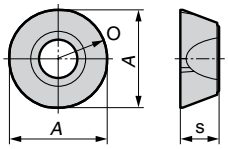
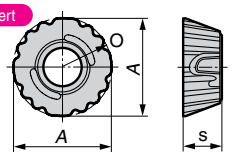


Fig 4 Surfing Insert

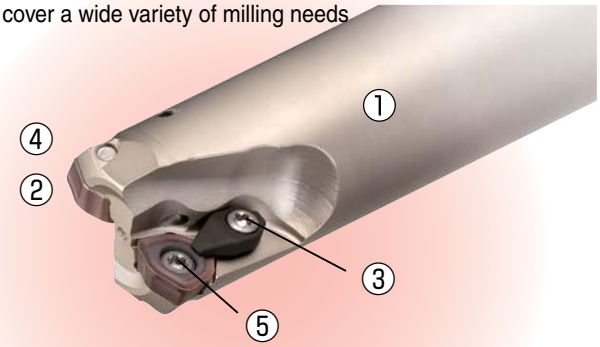


*1 -H: Strong edge. *2: When using anti-vibration inserts, 08 type and 08-CP type inserts must be set in alternating fashion.

MSX Type

General 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 a ø16mm to the large diameter ø100mm model, to cover a wide variety of milling needs.



Characteristics

① **Highly Durable Body** Special surface treatment improves scratch resistance

② **Versatile Machining Operations** Use for ramping, helical, and drilling work

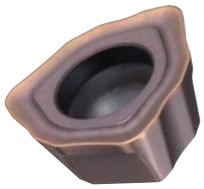
③ **Double Lock** Extra-strong clamping ensures stable cutting performance (Single clamp for ø22mm or thinner MSX06000 Type and MSX08000 Type)

④ **With oil hole** Improved chip evacuation with air or coolant supply hole and specially shaped pocket design

⑤ **Insert Shape** Unique tool shape packs cutting performance and cutting edge strength

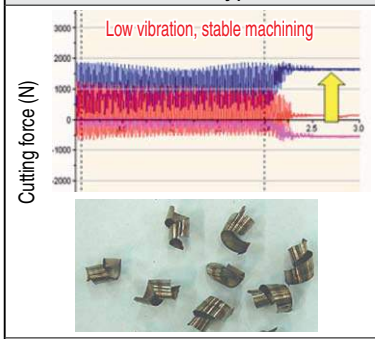
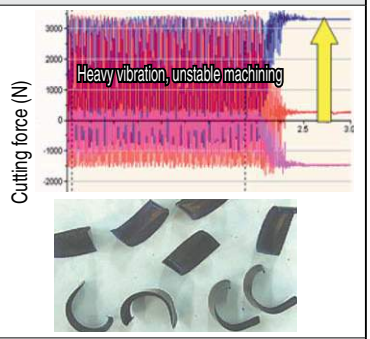
Insert Applications and Types

· Insert utilises a special cutting edge profile.
· Economical, three-cornered insert

Type	General Purpose Edge Type	Strong Edge Type
Application	General Turning (First choice)	Interrupted Cutting
Appearance/ Characteristics	 Sharper Edge	 Emphasis on Fracture Resistance

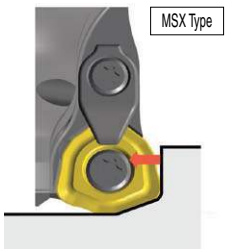
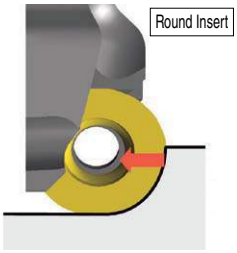
Cutting Performance

Cutting Force Comparison

MSX Type	Conventional Tool
	

Work material : S50C
Cutting Conditions : v_c=150m/min, f_z=1.0mm/t, a_e=25mm, a_p=2mm

Shoulder Milling Comparison of MSX Type and Conventional Tool

MSX Type	Conventional Tool
Performs under high working conditions 	Chatter-prone 
Cutting force is consistent, even when depth of cut is increased, for stable cutting performance.	Greater depth of cut increases contact length which increases cutting force.

Series

	Type	Dia.(mm)	No. of Teeth	Applicable Insert
Shell Type (H66)	**MSX 08000R**	ø40	4	WDMT 08 Type
	MSX 12000R	ø50 to ø63	4 to 5	WDMT 12 Type
	MSX 14000R	ø50 to ø100	3 to 6	WDMT 14 Type
Endmill Type (H67)	**MSX 06000E**	ø16 to ø25	2 to 3	WDMT 06 Type
	MSX 08000E	ø20 to ø35	2 to 3	WDMT 08 Type
	MSX 12000E	ø32 to ø50	2 to 4	WDMT 12 Type
	MSX 14000E	ø40 to ø63	2 to 4	WDMT 14 Type
Modular Type (H132)	**MSX 06000M**	ø16 to ø25	2 to 3	WDMT 06 Type
	MSX 08000M	ø25 to ø35	2 to 3	WDMT 08 Type
	MSX 12000M	ø32 to ø40	2 to 3	WDMT 12 Type

Notes on Corner Finishing

* Actual machined corners will have uncut and over-cut portions due to the shape of the inserts.

Fig1

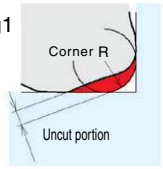
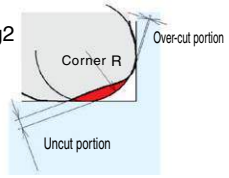


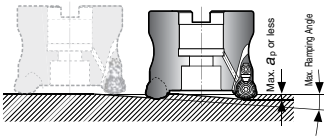
Fig2



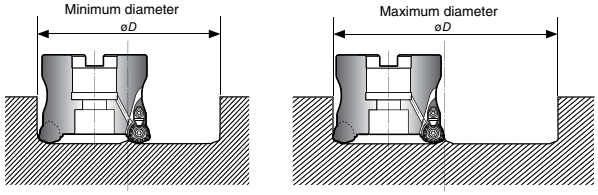
Corner R	MSX06000Type			MSX08000Type			MSX12000Type			MSX14000Type		
	Uncut portion	Over-cut portion	Fig	Uncut portion	Over-cut portion	Fig	Uncut portion	Over-cut portion	Fig	Uncut portion	Over-cut portion	Fig
2.0	0.403	0	1	0.735	0	1	1.312	0	1	1.642	0	1
2.5	0.263	0.087	2	0.593	0	1	1.171	0	1	1.501	0	1
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

Taper Cutting and Helical Milling

Taper Cutting



Helical Milling



Centre uncut portion cannot be remove with same cutter.

Centre uncut portion can be remove with same cutter.

øDc	MSX06000Type			MSX08000Type			MSX12000Type			MSX14000Type		
	Taper Cutting	Helical Milling		Taper Cutting	Helical Milling		Taper Cutting	Helical Milling		Taper Cutting	Helical Milling	
	Max. Ramping Angle	Min.	Max.	Max. Ramping Angle	Min.	Max.	Max. Ramping Angle	Min.	Max.	Max. Ramping Angle	Min.	Max.
16	6° 00'	21	30									
17	5° 00'	23	32									
18	4° 30'	25	34									
20	3° 30'	29	38	7° 30'	25	38						
22	3° 00'	33	42	5° 30'	29	42						
25	2° 00'	39	48	4° 00'	35	48						
28				3° 00'	41	54						
32				2° 30'	49	62	6° 30'	42	62			
35				2° 00'	55	68	5° 00'	48	68			
40				2° 00'	65	78	4° 00'	58	78	6° 00'	53	78
50							2° 30'	78	98	3° 30'	73	98
63							2° 00'	103	124	2° 00'	99	124
80										1° 30'	133	158
100										1° 00'	173	198

Recommended Cutting Conditions

Insert Cat. No.	Max. a_p	r_ε	Approx. r_ε
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

(a_p: Depth of Cut f_z: Feed Rate)

Work Material	Grade	Cutting Speed v_c(m/min)	Insert Cat. No.	Endmill Type										Shell Type			
				ø16		ø20		ø25		ø32		ø40		ø50/ø63		ø80/ø100	
				a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (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, Others	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 above recommended cutting conditions may require adjustment according to machine rigidity and work rigidity. The above figures are guidelines for use with the BT50 machine tool.
· The above cutting conditions assume a tool overhang length of L/D=3 (i.e. overhang length is 3 times tool diameter) or less.
When tool overhang is more than L/D=3 and less than or equal L/D=5, settings should be adjusted to approximately 70 to 80% of those indicated in the above cutting conditions (i.e. a_p and f_z).
When tool overhang is more than L/D=5 and less than or equal L/D=8, settings should be adjusted to approximately 50 to 60% of those indicated in the above cutting conditions (i.e. a_p and f_z).

MSX08000R/12000R/14000R Type

Rake Angle: Radial −3°to−8°, Axial 8°

1.5mm 20° (08000 Type) | 2.0mm 20° (12000 Type) | 2.5mm 20° (14000 Type)

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel ○

High Efficiency Machining for Steel, Cast Iron, and Stainless Steel

Fig1

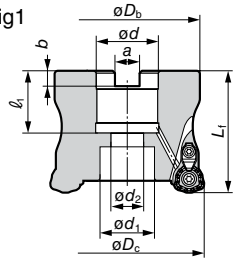
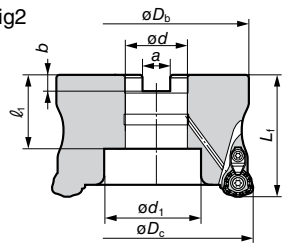


Fig2



■ Body (MSX08000)

Insert: WDMT08 Type

Metric

Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ1	ød1	ød2	No. of Teeth	Weight (kg)	Fig
MSX 08040RS	●	40	37	45	16	8.4	5.6	18	13.5	9	4	0.2	1

■ Body (MSX12000)

Insert: WDMT12 Type

Metric

Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ1	ød1	ød2	No. of Teeth	Weight (kg)	Fig
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 (MSX14000)

Insert: WDMT14 Type

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ1	ød1	ød2	No. 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
Imperial	MSX 14080R	●	*80	76	63	31.75	12.7	8.0	32	28	17	5	1.3	1
	14100R	●	*100	96	63	31.75	12.7	8.0	32	28	17	6	2.4	1

Inserts are not included.

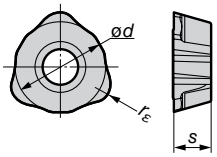
*Please use JISB1176 hexagonal bolt (ø80: M12 × 30-35mm, ø100: M16 × 40-45mm) for securing the ø80 or ø100 cutter to the arbour.

■ Inserts

Grade		Coated Carbide			
Application	High Speed/Light			K	
	General Purpose	P M	P M	K	
	Roughing	P M	P M		K

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

Usage	Cat. No.	ACP200	ACP300	ACK200	ACK300	Dimensions (mm) ød	s	rε	Applicable Body
General Purpose	WDMT 0804ZDTR	●	●	●	●	8.5	4.0	2.0	MSX08000R Type
	1205ZDTR	●	●	●	●	12	5.0	2.0	MSX12000R Type
	1406ZDTR	●	●	●	●	14	6.0	2.0	MSX14000R Type
Strong Edged	WDMT 0804ZDTR-H	●	●	●	●	8.5	4.0	2.0	MSX08000R Type
	1205ZDTR-H	●	●	●	●	12	5.0	2.0	MSX12000R Type
	1406ZDTR-H	●	●	●	●	14	6.0	2.0	MSX14000R Type



■ Identification Details

MSX 08 040 R S

(1) Cutter Series | (2) Insert Size | (3) Cutter | (4) Direction | (5) Metric Bore

■ Spare Parts

Screws	N·m	Spanner	Clamp	C Ring	Clamp Screw	Applicable Body
BFTX0306IP	2.0	TRDR08IP	CCH3.5	CR03	BFTX03510IP08	MSX08000R Type
BFTX0409IP	3.0	TRDR15IP	CCH3.5	CR03	BFTX03510IP15	MSX12000R Type
BFTX0511IP	5.0	TRDR20IP	CCH4.5	CR03	BFTX04513IP20	MSX14000R Type

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

H65

MSX06000E/08000E/12000E/14000E Type

Rake Angle: Radial -3°to-8° / Axial 8°

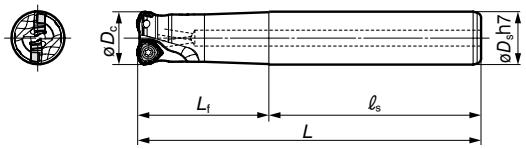
1.0mm 20° (06000 Type) | 1.5mm 20° (08000 Type) | 2.0mm 20° (12000 Type) | 2.5mm 20° (14000 Type)

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel ○

High Efficiency Machining for Steel, Cast Iron, and Stainless Steel

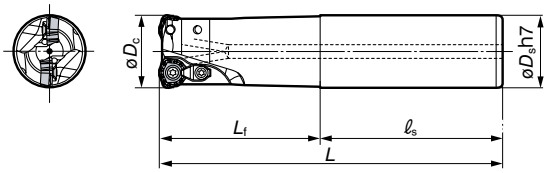
Single Lock

Fig 1



Double Lock

Fig 2



Modular Type H132

Body (MSX06000E) Insert: WDMT06 Type

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)	Fig
MSX 06016ES	●	16	16	30	80	110	2	0.2	1
06016EM	●	16	16	70	80	150	2	0.2	1
MSX 06017EM	●	17	16	20	130	150	2	0.2	1
MSX 06018EM	●	18	16	20	130	150	2	0.2	1
MSX 06020ES	●	20	20	50	80	130	3	0.3	1
06020EM	●	20	20	100	80	180	3	0.4	1
MSX 06022EM	●	22	20	30	150	180	3	0.4	1
MSX 06025ES	●	25	25	60	80	140	3	0.5	1
06025EM	●	25	25	120	130	250	3	0.8	1

Body (MSX08000E) Insert: WDMT08 Type

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)	Fig
MSX 08020ES	●	20	20	50	80	130	2	0.3	1
08020EM	●	20	20	100	80	180	2	0.3	1
MSX 08022EM	●	22	20	30	150	180	2	0.4	1
MSX 08025ES	●	25	25	60	80	140	2	0.4	2
08025EM	●	25	25	120	130	250	2	0.8	2
MSX 08028EM	●	28	25	40	210	250	2	0.9	2
MSX 08032ES	●	32	32	70	80	150	3	0.8	2
08032EM	●	32	32	120	130	250	3	1.4	2
MSX 08035EM	●	35	32	50	200	250	3	1.5	2

Body (MSX12000E) Insert: WDMT12 Type

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)	Fig
MSX 12032ES	●	32	32	70	80	150	2	0.8	2
12032EM	●	32	32	120	130	250	2	1.4	2
MSX 12035EM	●	35	32	50	200	250	2	1.4	2
MSX 12040ES	●	40	32	50	100	150	3	0.9	2
12040EM	●	40	32	50	200	250	3	1.5	2
MSX 12050EM	●	50	42	50	200	250	4	2.6	2

Body (MSX14000E) Insert: WDMT14 Type

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)	Fig
MSX 14040ES	●	40	32	50	100	150	2	0.9	2
14040EM	●	40	32	50	200	250	2	1.5	2
MSX 14050ES	●	50	42	50	100	150	3	1.5	2
14050EM	●	50	42	50	200	250	3	2.5	2
MSX 14063ES	●	63	42	50	100	150	4	1.7	2
14063EM	●	63	42	50	200	250	4	2.8	2

Inserts are not included.

Identification Details

MSX 06 016 E S

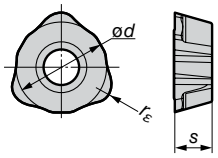
(1) Cutter Series | (2) Insert Size | (3) Cutter | (4) Endmill Type | (5) S : Short M : Medium

Inserts

Grade		Coated Carbide			
Application	High Speed/Light			K	
	General Purpose	PM	PM	K	
	Roughing	PM	PM		K

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

Usage	Cat. No.	ACP200	ACP300	ACK200	ACK300	Dimensions (mm) ød	s	rε	Applicable Cutter
General Purpose	WDMT 0603ZDTR	●	●	●	●	6.35	3.0	1.5	MSX06000E Type
	0804ZDTR	●	●	●	●	8.5	4.0	2.0	MSX08000E Type
	1205ZDTR	●	●	●	●	12	5.0	2.0	MSX12000E Type
	1406ZDTR	●	●	●	●	14	6.0	2.0	MSX14000E Type
Strong Edged	WDMT 0603ZDTR-H	●	●	●	●	6.35	3.0	1.5	MSX06000E Type
	0804ZDTR-H	●	●	●	●	8.5	4.0	2.0	MSX08000E Type
	1205ZDTR-H	●	●	●	●	12	5.0	2.0	MSX12000E Type
	1406ZDTR-H	●	●	●	●	14	6.0	2.0	MSX14000E Type



Spare Parts

Screws	N·m	Spanner	Clamp	C Ring	Clamp Screw	Applicable Body
BFTX02505IP	1.5	TRDR08IP	—	—	—	MSX06000E Type
BFTX0306IP	2.0	TRDR08IP	—	—	—	MSX08020E , MSX08022E Type
BFTX0306IP	2.0	TRDR08IP	CCH3.5	CR03	BFTX03510IP08	Other MSX08000E types except the above items
BFTX0409IP	3.0	TRDR15IP	CCH3.5	CR03	BFTX03510IP15	MSX12000E Type
BFTX0511IP	5.0	TRDR20IP	CCH4.5	CR03	BFTX04513IP20	MSX14000E Type

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

H65

WMM Type

1 Cutter Body, 1 Insert Geometry, Multiple Applications.

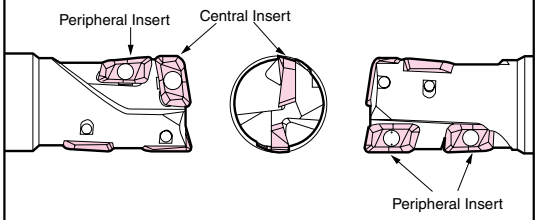
General Features

A single WaveMill performs a variety of operations such as grooving, shoulder milling, ramping, pocketing, drilling, helical cutting, etc., and eliminate the need to stock a variety of application specific tools.

Characteristics and Applications

- Multi-functional cutter efficiently performs a number of cutting operations
- Excellent for ramping, helical cutting and pocketing
- Uses standard inserts interchangeable with those used on other WaveMill cutters
- Strong high rake insert gives smooth cutting
- Easy to manage with one style of insert
- Best suited for Stainless Steel machining

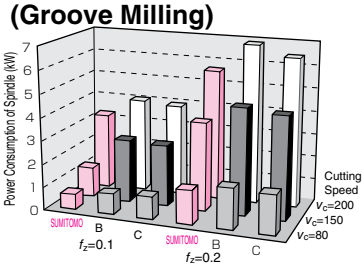
Insert Orientation of WMM Type Cutter



Product Range

Type	Description	Diameter (mm) ø20 – ø30 – ø40
2000E	Standard Type	20 – 30
2000EL	Long Type	20 – 30
2000ELH	Long Type w / Oil Hole	20 – 30
2000EXLH	Extra-Long Type w / Oil Hole	22 – 30
3000E	Standard Type	32 – 40
3000EL	Long Type	32 – 40
3000ELH	Long Type w / Oil Hole	32 – 40
3000EXLH	Extra-Long Type w / Oil Hole	35 – 40

Performance Comparison (Groove Milling)



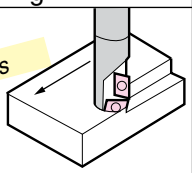
Diameter of Tool Used: ø25
Work Material: S50C
Cutting Conditions: v_c=80,150,200m/min、f_z=0.1,0.2mm/t
a_p=15mm、Overhanging Length of Tool=40mm

Application Examples Tool : WMM2025E

Shoulder Milling

SUS304

Cutting of stainless steel too!

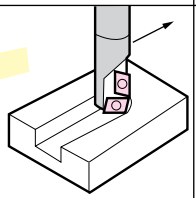


Tool Diameter: ø25 Insert: APMT103504PDER(ACZ350)
D.O.C. : a_p=25mm 、a_e=5mm
Cutting Speed:v_c=120m/min、Feed Rate: f_z=0.15mm/t
Air Blow

Grooving

FC250

Deep grooving can be performed easily. Easy chip removal

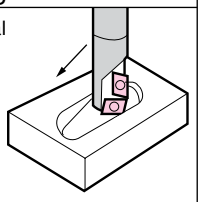


Tool Diameter: ø25 Insert: APMT103504PDER(ACZ310)
D.O.C.: a_p=15mm 、a_e=25mm
Cutting Speed: v_c=180m/min、Feed Rate:f_z=0.12mm/t
Air Blow

Taper Milling

S50C Block Material

Capable of tapered recess cutting of a prepared hole

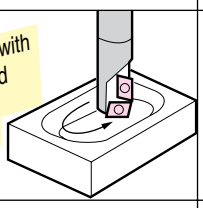


Tool Diameter: ø25 Insert: APMT103504PDER(ACZ350)
Cutting Width: a_e=25mm、Depth: a_p=15mm
Cutting Speed: v_c=200m/min、Feed Rate: f_z=0.1mm/t
Ramp Angle: P=15°
Air Blow

Pocketing

S50CBlock Material

Capable of pocketing with continuous lateral feed from initial drilling or taper milling process

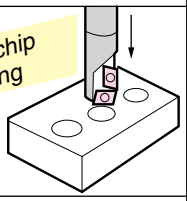


Tool Diameter: ø25 Insert: APMT103504PDER(ACZ350)
The following process was done in succession from a deep drilling process of 15mm depth.
D.O.C.: a_p=25mm, a_e=15mm
Cutting Speed: v_c=200m/min、Feed Rate: f_z=0.1mm/t
Air Blow

Drilling

S50CBlock Material

Capable of easy chip removal and drilling without tool damage

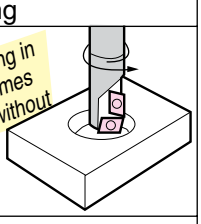


Tool Diameter: ø25 Insert: APMT103504PDER(ACZ350)
Hole Size: ø25mm、Depth: a_p=15mm
Cutting Speed: v_c=200m/min、Feed Rate: f=0.1mm/rev
Step-Feed: 0.5mm
Air Blow

Helical Milling

S50CBlock Material

Capable of large boring in diameter of 1.2-1.8 times the cutter diameter without prepared hole

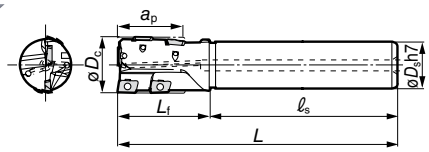


Tool Diameter: ø25 Insert: APMT103504PDER(ACZ350)
Hole Size: ø40mm、Depth: a_p=20mm
Cutting Speed: v_c=300m/min、Feed Rate: f=0.1mm/rev
Axial Feed: 15mm/Pitch
Air Blow

SEC-Wave Mill

WMM 2000 E/EL ELH/EXLH Type

Rake Angle: Radial 15° to 16° / Axial 7° to 11° | 17~35mm | 90° | P M K N N S H



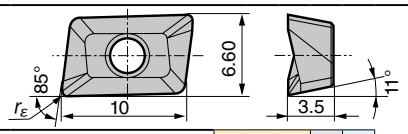
Body (Standard Type/WMM 2000E Type)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	ap	Lf	ℓs	L	Total Teeth	Effective Teeth
WMM 2020E	●	**20**	20	17	35	95	130	3	1
2021E	●	**21**	20	17	35	95	130	3	1
2025E	●	**25**	25	26	40	100	140	4	1
2026E	●	**26**	25	26	40	100	140	4	1
2030E	●	**30**	25	35	50	100	150	5	1
((Long Type)									
WMM 2020EL	●	**20**	20	17	60	125	185	3	1
2021EL	●	**21**	20	17	35	150	185	3	1
2025EL	●	**25**	25	26	75	145	220	4	1
2026EL	●	**26**	25	26	40	180	220	4	1
2030EL	●	**30**	25	35	50	180	230	5	1
(Long Type with Coolant Hole)									
WMM 2020ELH	●	**20**	20	17	60	125	185	3	1
2021ELH	●	**21**	20	17	35	150	185	3	1
2025ELH	●	**25**	25	26	75	145	220	4	1
2026ELH	●	**26**	25	26	40	180	220	4	1
2030ELH	●	**30**	25	35	50	180	230	5	1
(Extra Long Type with Coolant Hole)									
WMM 2022EXLH		**22**	20	17	35	215	250	3	1
2027EXLH		**27**	25	26	40	280	320	4	1
2030EXLH		**30**	25	35	50	300	350	5	1

Inserts are not included.

Inserts

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



Application	Grade	Coated Carbide			Carbide	DLC
	High Speed/Light				K N	N
	General Purpose	M	P	K		N
	Roughing					

Cat. No.	ACZ350	ACZ330	ACZ310	H1	DL1000	Dimensions rε
APMT 103504PDER	●	●	●	—	—	0.4
103508PDER	●	●	●	—	—	0.8
103512PDER	●	●	●	—	—	1.2
APMT 103504PDER-H	●	●	●	—	—	0.4
103508PDER-H	●	●	●	—	—	0.8
103512PDER-H	●	●	●	—	—	1.2
APET 103504PDER-F	●	●	●	—	—	0.4
APET 103504PDFR-S	—	—	—	●	●	0.4

-H: Strong Edge Type, F: Ground Insert, S: For Aluminum Alloy

Spare Parts (Common)

Screw		Spanner	Anti-seizure Cream	Applicable Endmill
BFTX02506N	1.5	TRD08	SUMI-P	WMM2000 Type
BFTX03584	3.0	TRD15		WMM3000 Type

Recommended Tightening Torque (N·m)

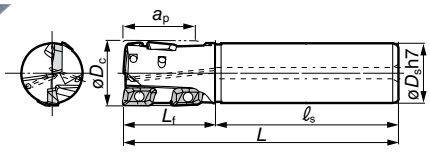
Recommended Cutting Conditions (Common) Diameter ø20 to ø26mm (Not for extra long type)

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t)	Min.- **Optimum** -Max.	Grade
P	Carbon Steel	180 to 280HB	80-**120**-160	Shoulder Milling	0.05-**0.13**-0.20	ACZ330
				Grooving	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
				Grooving	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
				Grooving	0.05-**0.09**-0.12	
				Drilling	0.05-**0.12**-0.18	
N	Aluminium Alloy	—	200-**300**-500	Shoulder Milling	0.10-**0.15**-0.20	DL1000
				Grooving	0.05-**0.08**-0.10	
				Drilling	0.05-**0.08**-0.10	

SEC-Wave Mill

WMM 3000 E/EL ELH/EXLH Type

Rake Angle: Radial 17° to 19° / Axial 7° to 11° | 39mm | 90° | P M K N N S H



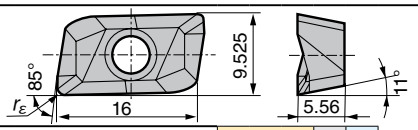
Body (Standard Type/WMM 3000E Type)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	ap	Lf	ℓs	L	Total Teeth	Effective Teeth
WMM 3032E	●	**32**	32	39	50	100	150	4	1
3033E	●	**33**	32	39	50	100	150	4	1
3035E	●	**35**	32	39	50	100	150	4	1
3040E	●	**40**	32	39	55	105	160	4	1
((Long Type)									
WMM 3032EL	●	**32**	32	39	90	140	230	4	1
3033EL	●	**33**	32	39	50	180	230	4	1
3035EL	●	**35**	32	39	50	180	230	4	1
3040EL	●	**40**	32	39	55	185	240	4	1
(Long Type with Coolant Hole)									
WMM 3032ELH	●	**32**	32	39	90	140	230	4	1
3033ELH	●	**33**	32	39	50	180	230	4	1
3035ELH	●	**35**	32	39	50	180	230	4	1
3040ELH	●	**40**	32	39	55	185	240	4	1
(Extra Long Type with Coolant Hole)									
WMM 3035EXLH		**35**	32	39	50	320	370	4	1
3040EXLH		**40**	32	39	55	365	420	4	1

Inserts are not included.

Inserts

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



Application	Grade	Coated Carbide			Carbide	DLC
	High Speed/Light				K N	N
	General Purpose	M	P	K		N
	Roughing					

Cat. No.	ACZ350	ACZ330	ACZ310	H1	DL1000	Dimensions rε
APMT 160508PDER	●	●	●	—	—	0.8
160512PDER	●	●	●	—	—	1.2
160516PDER	●	●	●	—	—	1.6
APMT 160508PDER-H	●	●	●	—	—	0.8
160512PDER-H	●	●	●	—	—	1.2
160516PDER-H	●	●	●	—	—	1.6
160520PDER-H *	●	●	●	—	—	2.0
160530PDER-H *	●	●	●	—	—	3.0
160540PDER-H *	●	●	●	—	—	4.0
160550PDER-H *	●	●	●	—	—	5.0
160560PDER-H *	●	●	●	—	—	6.0
APET 160508PDER-F	●	●	●	—	—	0.8
APET 160504PDFR-S	—	—	—	●	●	0.4
160508PDFR-S	—	—	—	●	●	0.8

-H: Strong Edge Type, F: Ground Insert, S: For Aluminum Alloy
* Cutter body modification is required.
* Correct the tool diameter by +0.5mm before use.

Recommended Cutting Conditions (Common) Diameter ø30 to ø40mm (Not for extra long type)

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t)	Min.- **Optimum** -Max.	Grade
P	Carbon Steel	180 to 280HB	80-**120**-160	Shoulder Milling	0.05-**0.15**-0.25	ACZ330
				Grooving	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
				Grooving	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
				Grooving	0.05-**0.10**-0.15	
				Drilling	0.05-**0.13**-0.20	
N	Aluminium Alloy	—	200-**300**-500	Shoulder Milling	0.10-**0.15**-0.20	DL1000
				Grooving	0.05-**0.08**-0.10	
				Drilling	0.05-**0.08**-0.10	

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

PWC(F)4000 Type

Rake Angle		
	Radial	−15°
	Axial	−5°

15mm 88°

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

High Efficiency Semi-Shouldering for Cast Iron

Fig 1

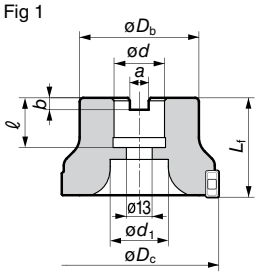


Fig 2

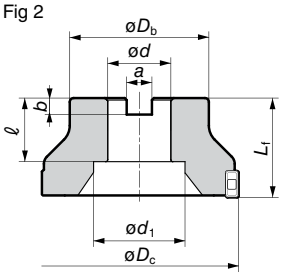
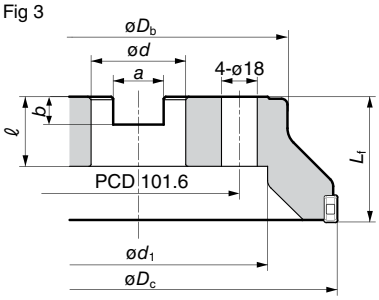


Fig 3



■ Body (Standard Type) Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	ød	øDb	ød1	Lf	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
PWC 4080R	●	PWC 4080L		*80	25.4	60	29.5	50	9.5	6	25	7	0.9	1
4100R	●	4100L		100	31.75	70	46	50	12.7	8	32	8	1.3	2
4125R	●	4125L		125	38.1	80	56	63	15.9	10	38	10	2.5	2
4160R	●	4160L		160	50.8	100	72	63	19.1	11	38	12	4.2	2
4200R	●	4200L		200	47.625	150	130	63	25.4	14	35	16	7.2	3

■ Body (Fine Pitch Type) Imperial

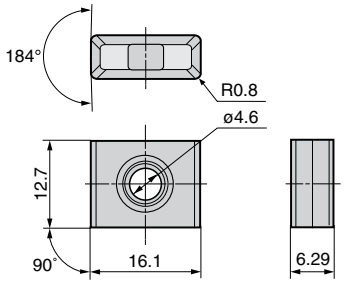
Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	ød	øDb	ød1	Lf	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
PWCF 4080R	●	PWCF 4080L		*80	25.4	60	29.5	50	9.5	6	25	9	0.9	1
4100R	●	4100L		100	31.75	70	46	50	12.7	8	32	12	1.4	2
4125R	●	4125L		125	38.1	80	56	63	15.9	10	38	15	2.6	2
4160R	●	4160L		160	50.8	100	72	63	19.1	11	38	18	4.3	2
4200R	●	4200L		200	47.625	150	130	63	25.4	14	35	24	7.4	3

Inserts are not included.

*Please use hexagonal bolt (JISB1176) M12 x 30-35 mm for securing ø80 mm cutter to the arbour.

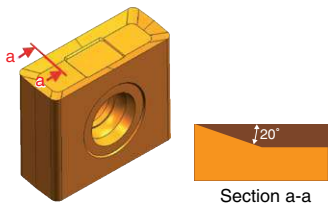
■ Inserts

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



● General Purpose G Series

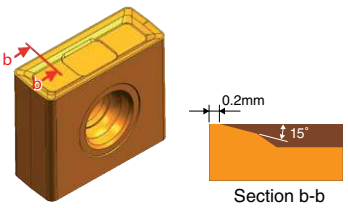
Fig 4



Section a-a

● Strong Edge Type H Series

Fig 5



Section b-b

Grade		Coated Carbide		
Application	High Speed/Light	K	K	
	General Purpose	K	K	
	Roughing			K

Cat. No.	ACK100	ACK200	ACK300	Fig	Application	Remarks
LNMX 160608PNSN-G		●	●	4	General Purpose	Recommended
160608PNSN-H	●	●	●	5	Heavy interrupted cutting and other unstable applications	

■ Spare Parts

Screw		Spanner	Anti-seizure Cream
			
BFTX0412N	3.0	TTX15W	SUMI-P

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	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, cutting depth, and other factors.

PWS(F)/PWSR Type

■ General Features

Highly reliable shoulder milling cutter with tangentially mounted for never-before-possible high cutting edge strength and sharp cutting edges.

A 2-step insert array structure creates a new PWSR Type to meet the needs of deep cutting.

■ Characteristics

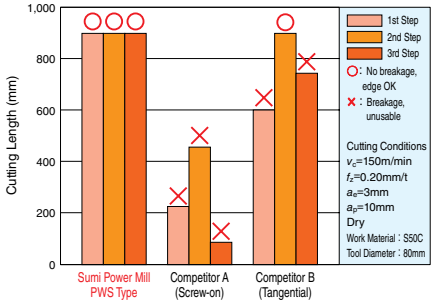
- Tangentially mounted inserts for outstanding cutting edge strength combined with optimised breaker for outstanding edge sharpness and cutting ability.
- Nicked insert design created with high-precision molding technology allows stable milling even in applications with large tool overhang.
- New ACP and ACK milling grades are used to meet the needs of various types of work material.

■ Performance

● Performance Comparison with General-purpose G-type Inserts

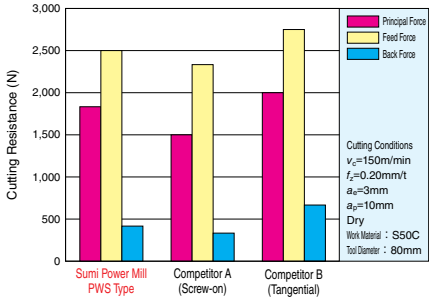
■ Cutting Edge Strength Comparison

High cutting edge strength for excellent stability!



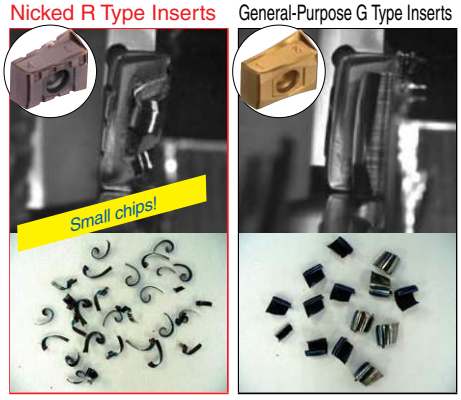
■ Comparison of Cutting Force

Cutting that is nearly the same as screw-on type!!



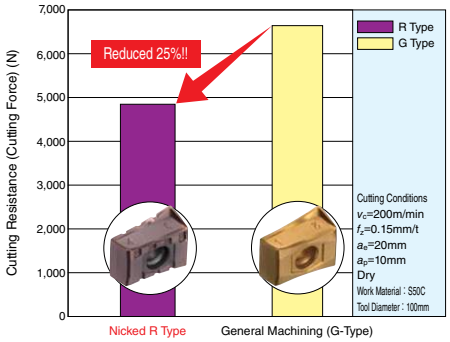
● Performance Comparison with Nicked R Type Inserts

Nicked R Type Inserts　General-Purpose G Type Inserts

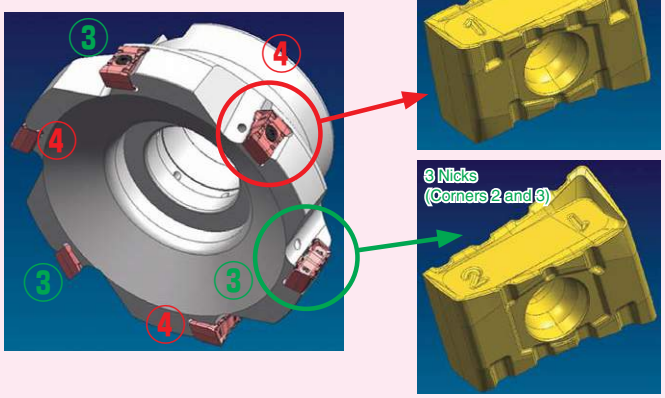


■ Comparison of Cutting Force

Reduced cutting power and excellent vibration resistance!



⚠ Cautions when Using Nicked R Type Inserts



1) Precautions During Installation

When using R type nicked indexable inserts, attach them so that the nicked grooves alternate as shown in the image to the left.

2) Cutting Condition Precautions

In order to attach as shown in the image to the left, the feed rate per tooth is double that when attaching the same-shaped inserts on all teeth. This means that adjustments should be made so the upper feed limit is as shown below.

f_z=0.25mm/t

Example: Use at f_z=0.2mm/t

Feed when all teeth are normal: 0.2mm/t

Feed when nicked: 0.4mm/t

Any incorrect use of inserts may damage tools.

SEC-Sumi Power Mill

PWS(F)4000 Type

Rake Angle		
	Radial	−15°
	Axial	−6°

16mm 90°

P Steel ◎ | M Stainless Steel ○ | K Cast Iron ◎ | N Non-Ferrous Met. | N Aluminum | S Exotic Alloy | H Hardened Steel

Shoulder Milling for Steel, Stainless Steel & Cast Iron

Fig1

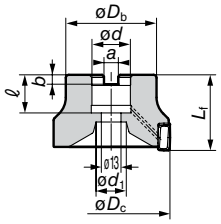


Fig 2

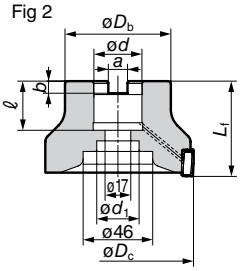


Fig 3

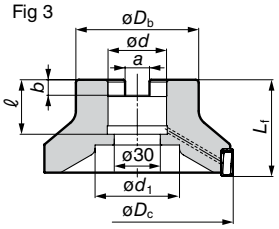


Fig 4

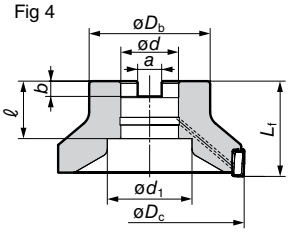
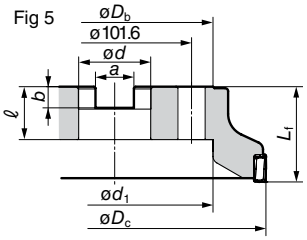


Fig 5



■ Body (Standard Type) Imperial

Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Weight (kg)	Fig
		øD_c	ød	øD_b	ød_1	L_f	a	b	ℓ			
PWS 4080R	●	*80	25.4	60	20	50	9.5	6	25	4	1.0	1
4100R	●	*100	31.75	70	28	63	12.7	8	32.5	6	1.8	2
4125R	●	125	38.1	80	55	63	15.9	10	35.5	6	2.4	3
4160R	●	160	50.8	100	72	63	19.1	11	38	8	4.0	4
4200R	●	200	47.625	130	130	63	25.4	14	35	10	6.5	5
4250R	●	250	47.625	130	160	63	25.4	14	35	12	12.3	5

■ Body (Fine Pitch Type) Imperial

* Cutters with sizes of ø200 mm or above come with seats (no coolant holes).

Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Weight (kg)	Fig
		øD_c	ød	øD_b	ød_1	L_f	a	b	ℓ			
PWSF 4080R	●	*80	25.4	60	20	50	9.5	6	25	6	0.9	1
4100R	●	*100	31.75	70	28	63	12.7	8	32.5	8	1.7	2
4125R	●	125	38.1	80	55	63	15.9	10	35.5	8	2.3	3
4160R	●	160	50.8	100	72	63	19.1	11	38	10	3.9	4
4200R	●	200	47.625	130	130	63	25.4	14	35	12	6.4	5
4250R	●	250	47.625	130	160	63	25.4	14	35	14	12.2	5

* Cutters with sizes of ø200 mm or above come with seats (no coolant holes).

Inserts are not included.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100mm cutter to the arbour.

■ Insert

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

Grade		Coated Carbide							
Application	High Speed/Light	P			K				
	General Purpose		P M	P M	K				
	Roughing		P M	P M		K			

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	Application	Remarks	Fig
LNMX170808PNSR-L	●	●	●	●	●	Light Cut		6
170808PNSR-G	●	●	●	●	●	General Purpose	Recommended	6
170808PNSR-R	●	●	●	●	●	Heavy Cut	Nicked	7

Fig 6

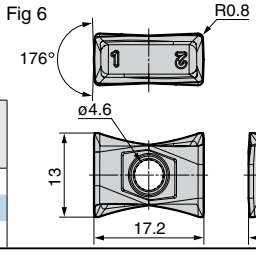
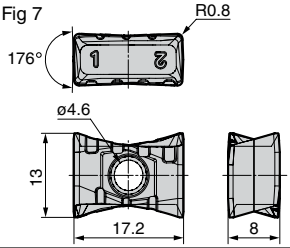


Fig 7



■ Spare Parts

Stopper Screw (For Insert/Seat)		Spanner	Anti-seizure Cream	Seat (*)
				
BFTX0412IP	3.0	TTR15IP	SUMI-P	PWSS4R

N·m Recommended Tightening Torque (N·m)

* Included with ø200 mm or larger

■ Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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, cutting depth, and other factors.

Rake Angle		
	Radial	−15°
	Axial	−6°

Max. Depth of Cut: 31 mm, 90°

P (Steel) ◎ | M (Stainless Steel) ○ | K (Cast Iron) ◎ | N (Non-Ferrous Metal) | N (Aluminum) | S (Exotic Alloy) | H (Hardened Steel)

Shoulder Milling for Steel, Stainless Steel & Cast Iron

Fig1

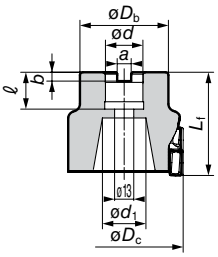


Fig 2

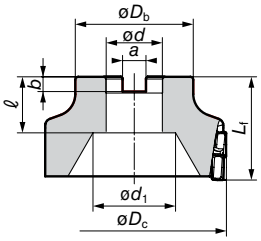


Fig 3

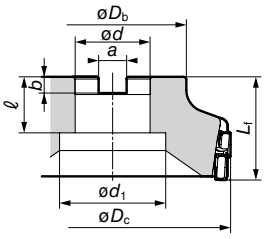
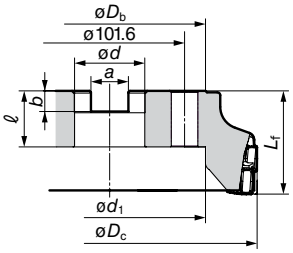


Fig 4



■ Body (2-step Type) Imperial

Cat. No.	Stock	Dimensions (mm) øDc	ød	øDb	ød1	Lf	a	b	ℓ	No. of Teeth	Effective Teeth	Weight (kg)	Fig
PWSR 4080R		*80	25.4	60	29.5	70	9.5	6	25	8	4	1.4	1
4100R		*100	31.75	70	46	70	12.7	8	32	12	6	2.0	2
4125R		125	38.1	80	56	70	15.9	10	38	12	6	3.0	2
4160R		160	50.8	100	72	70	19.1	11	38	16	8	5.2	3
4200R		200	47.625	130	160	70	25.4	14	38	20	10	8.0	4

*Cutters with sizes of ϕ200 mm or above come with seats.
Inserts are not included.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100mm cutter to the arbour.

■ Insert

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

Grade		Coated Carbide				
Application	High Speed/Light	P			K	
	General Purpose		PM	PM	K	
	Roughing		PM	PM		K

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	Application	Remarks	Fig
LNMX170808PNSR-L	●	●	●	●	●	Light Cut		5
170808PNSR-G	●	●	●	●	●	General Purpose	Recommended	5
170808PNSR-R	●	●	●	●	●	Heavy Cut	Nicked	6

Fig 5

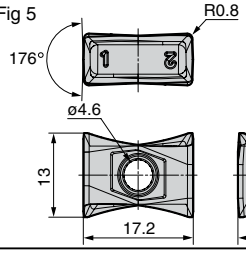
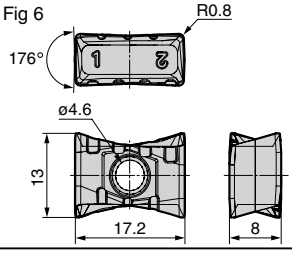


Fig 6



■ Spare Parts

Stopper Screw (For Insert/Seat)		Spanner	Anti-seizure Cream	Seat (*)
BFTX0412IP	3.0	TTR15IP	SUMI-P	PWSS4R

N·m Recommended Tightening Torque (N·m)

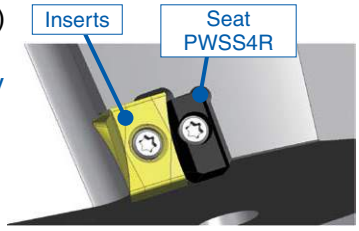
* Included with ø200 mm or larger

■ Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Carbon Stee	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, cutting depth, and other factors.

Large diameter (ϕ200 or above) body structure
Safety seat design protects body



SEC-Wave Mill

WFX Type

General Features

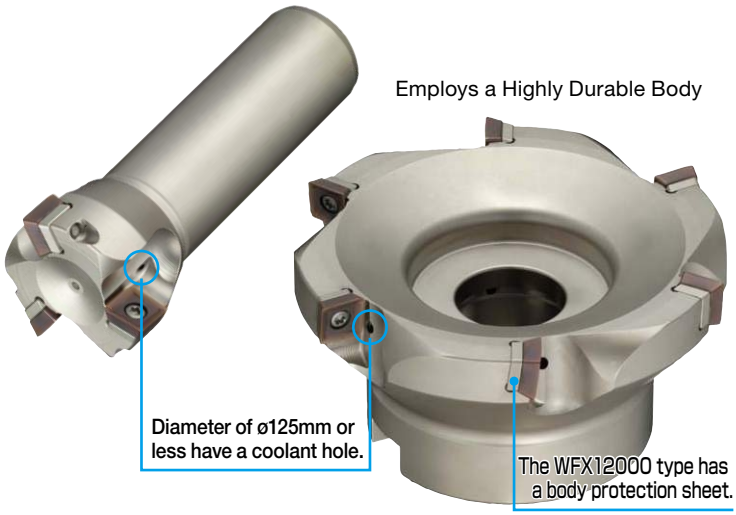
SEC-Wave Mill WFX type for shoulder milling is a screw-locking type cutter capable of using four corners.
Ideal cutting edge design delivers good squareness.

The WFX08000 type has also been added
(max. depth of cut: 6.0mm) for small-depth cutting.
Our wide lineup covers a wide variety of applications.

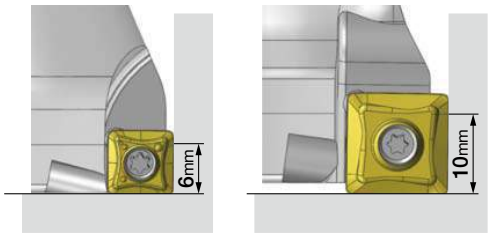
SEC-Wave Mill
WFXO 8000 Type

Characteristics

The insert shape optimized for shoulder milling combined with a high-precision body leaves a superior machined surface finish.



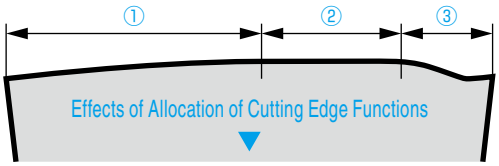
Max. depth of cut



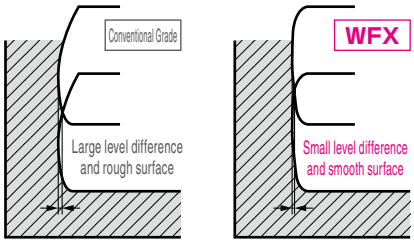
WFX08000 Type (Max.6mm)

WFX12000 Type (Max.10mm)

Optimized Edge Shape



① : The convex shape **ensures the cutting edge strength**.
② : The flat shape **reduces level differences** in carving.



③ : The wiper edge function **improves the surface roughness**.

Series

Shell Type

Metric Imperial

WFX	WFXM	WFXF
Standard Pitch	Fine Pitch	Ultra-Fine Pitch
WFX08000RS New →H77	**WFXM**08000RS New →H78	**WFXF**08000RS New →H79
ø**40-100**mm, **3-8** flutes	ø**40-100**mm, **4-10** flutes	ø**40-100**mm, **6-12** flutes
WFX08000R New →H77	**WFXM**08000R New →H78	**WFXF**08000R New →H79
ø**80-100**mm, **6-8** flutes	ø**80-100**mm, **8-10** flutes	ø**80-100**mm, **10-12** flutes
WFX12000RS →H80		**WFXF**12000RS →H81
ø**50-100**mm, **3-5** flutes		ø**50-100**mm, **4-7** flutes
WFX12000R →H80		**WFXF**12000R →H81
ø**80-250**mm, **4-12** flutes		ø**80-250**mm, **6-18** flutes

Endmill Type

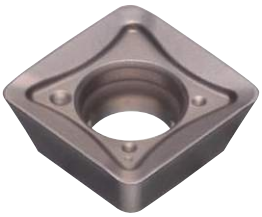
WFX-E	WFXM-E	WFXF-E
Standard Pitch	Fine Pitch	Ultra-Fine Pitch
WFX08000E New →H82	**WFXM**08000E New →H82	
ø**20-63**mm, **2-5** flutes	ø**25-63**mm, **3-6** flutes	
WFX12000E →H83		**WFXF**12000E →H83
ø**40-80**mm, **3-4** flutes		ø**50-80**mm, **4-6** flutes

Modular Type

WFX-M
Standard Pitch
WFX08000M New →H129
ø**20-40**mm, **2-3** flutes

Economical Four-Cornered Insert

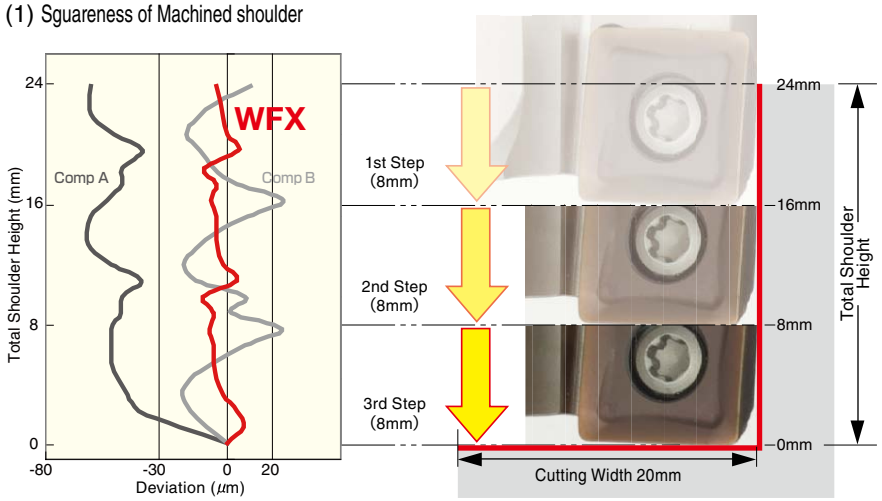
WFX12000 Type Insert
(General-Purpose G Type Chipbreaker)

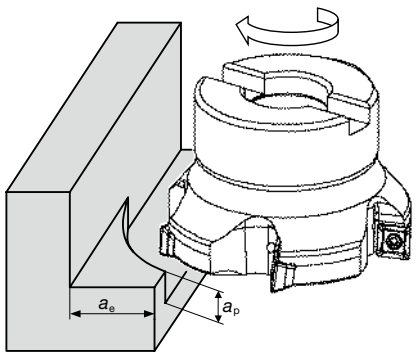


WFX08000 Type Insert
(General-Purpose G Type Chipbreaker)

■ Performance

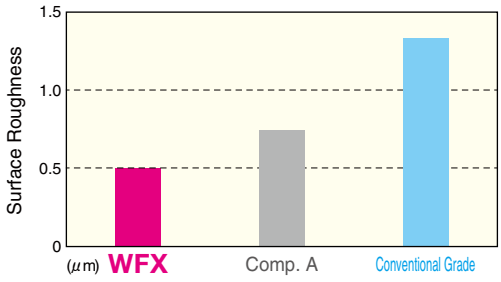
(1) Squareness of Machined shoulder





Work Material : **S50C** Tool : **WFX12100R** (ø100×5 flutes)
Cutting Conditions : v_c =**200**m/min, f_z =**0.15**mm/t,
a_p =**8.0**mm×**3** times, a_e=**20**mm

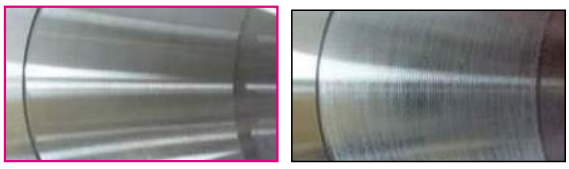
(2) Surface Roughness Comparison



Work Material : **SCM440** Tool : **WFX12100R** (ø100×5 flutes)
Cutting Conditions : v_c =**200**m/min, f_z=**0.10**mm/t,
a_p =**3.0**mm, a_e=**90**mm

(2) Comparison of Surface Properties

Work Material : **S50C**
Cutting Conditions : a_p =**0.5**mm

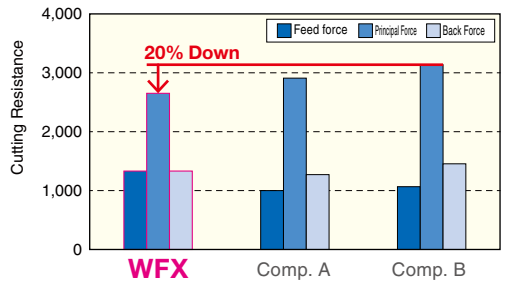


Glossy without Clouding　　Clouded without Gloss

Work Material : **SUS304**
Cutting Conditions : a_p =**0.5**mm

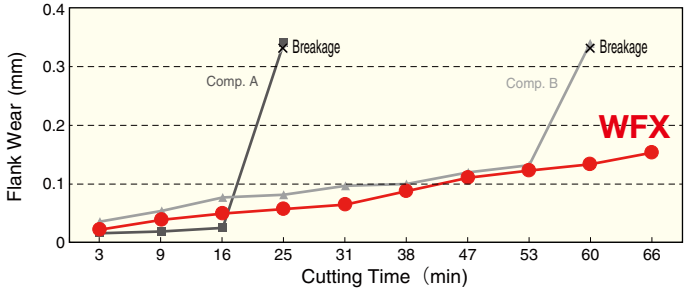
WFX　　Comp. A

(3) Cutting Resistance Comparison



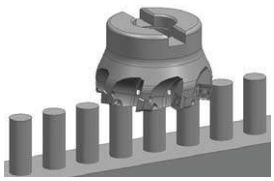
Work Material : **S50C** Tool : **WFX12100R** (ø100×5 flutes)
Cutting Conditions : v_c =**200**m/min, f_z =**0.15**mm/t,
a_p =**10**mm, a_e=**20**mm

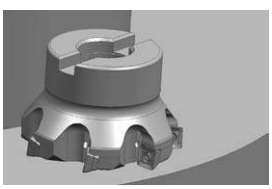
(4) Comparison of Wear Resistance



Work Material : **SCM440** Tool : **WFX12100R** (ø100 x 1 flutes)
Cutting Conditions : v_c =**200**m/min, f_z =**0.15**mm/t,
a_p =**5.0**mm, a_e=**30**mm

■ Application Examples

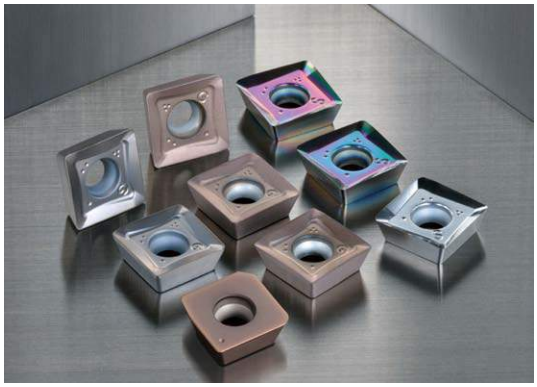
Work (S50C)		SEH Product	Conventional Grade
	Tool	**WFXF08063RS**	
	Grade	**ACP200**	
	Tool Diameter(mm)	ø63	ø63
	No. of Teeth	8	5
	v_c(mm/min)	220	220
	v_f(mm/min)	1,100	1,100
	f_z(mm/t)	0.15	0.20
	a_p(mm)	3.0	4.0
	a_e(mm)	50	50
	Coolant	Wet	Wet
	Results	• Vibration reduced by approximately 30%. • Good machined surface • Tool life is doubled.	

Work (FCD450)		SEH Product	Conventional Grade
	Tool	**WFXF12100R**	
	Grade	**ACK300**	
	Tool Diameter(mm)	ø100	ø100
	No. of Teeth	7	6
	v_c(m/min)	200	200
	v_f(mm/min)	446	382
	f_z(mm/t)	0.10	0.10
	a_p(mm)	0.05	0.05
	a_e(mm)	-	-
	Coolant	Dry	Dry
	Results	• Good Surface Roughness Ra 0.98 → 0.38μm, Rz 7.63 → 3.34μm • Cutting time is shortened. Insert life is extended by approximately 20%.	

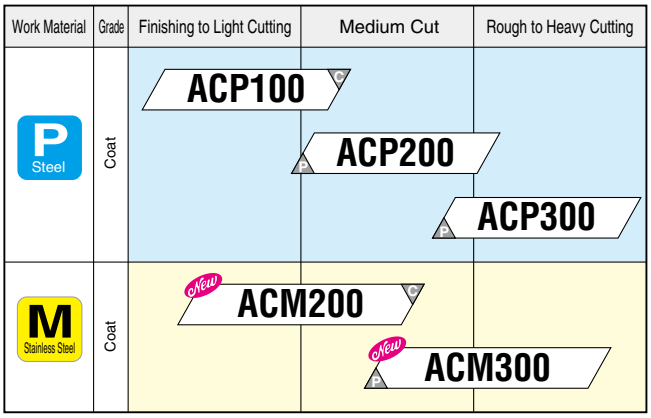
WFX Type

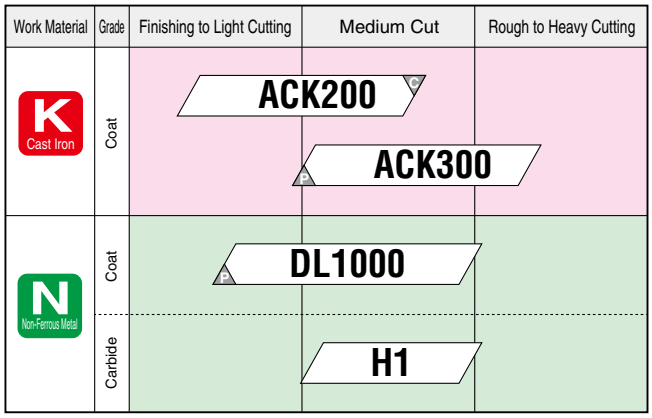
Insert Grades

The WFX type offers the newly developed multi-layer PVD coating structure New Super ZX Coat on these grades: New ACP200, New ACP300, and New ACK300. With excellent resistance against wear, fracture, and adhesion, the grades achieve 1.5 times longer tool life than conventional coating.
In addition to the DL1000 and H1 for non-ferrous metals and T4500A, a new cermet grade for milling, we have released the ACM200 and ACM300 grades for stainless steel and exotic alloys, thereby covering a wide range of work materials.



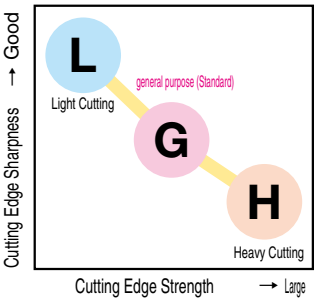
Grade Selection





The letters "C" and "P" at either end of each grade indicate coating type. ▽ : CVD △ : PVD Blank: Non-coated

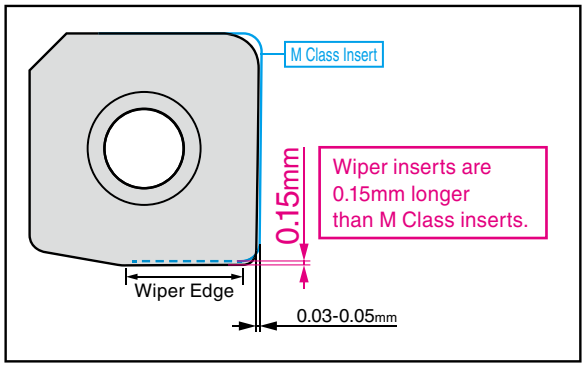
Chipbreaker Selection

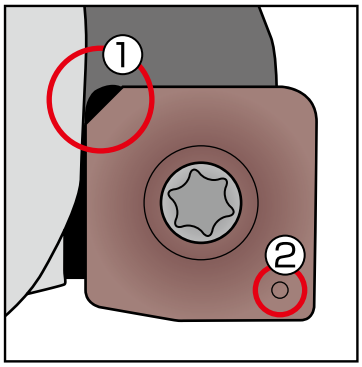


Work Material	P Steel K Cast Iron				N Aluminium
Breaker	L Type	G Type	H Type	Wiper Insert	S Type
Characteristic	Low Cutting Force	General Purpose	Strong Edge	Wiper Edge	Sharp Edge
Cutting Edge Figure	20°	15°	10°	15°	25°
Application	Light Cutting, Low Rigidity Milling Low-Burr Design	**Main Chipbreaker** General - Interrupted Milling	Heavy Cut, Heavy Interrupted Machining Hardened steel	Precision Finishing	Non-Ferrous Metal

Wiper Insert

Optimised wiper edge shape provides superior surface roughness.





Important Notes About Wiper Inserts

- Wiper inserts are single-cornered.
- Attach the wiper insert so that the chamfered corner is in location 1 shown in the figure.
- Be sure to use the corner with an ID mark (2 in the figure). (08-size inserts have no marks.)
- Refer to page N17 for details about wiper inserts.

WFX08000R(S) Type

Rake Angle	Radial	−6°
	Axial	12°

6mm 90°

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

Shoulder Milling for Steel, Stainless Steel, Die Steel, Cast Iron, Non-Ferrous Alloys

New

Fig 1

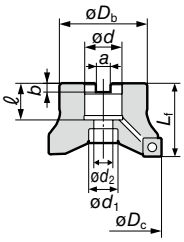


Fig 2

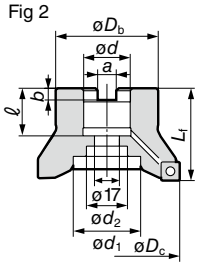
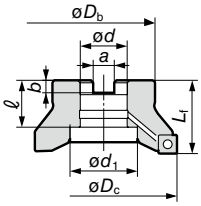


Fig 3



■ Body (Standard Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. 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	7	25	20	14	6	1.0	1
	08100RS	●	100	70	50	32	14.4	8	32	46	—	8	1.4	3
Imperial	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 not included. Check the collet attachment size (ød) when selecting the cutter.

＊Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

■ Identification Details

WFX 08 040 R S

(1) Cutter Series | (3) Insert Size | (4) Cutter | (5) Direction | (6) Metric Bore

■ Insert

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		M S		K N		N					
	General Purpose		P M	P M	K		M S	M S			N		P			
	Roughing		P M	P M		K		M S								
Cat. No.		ACP100	ACP200 New	ACP300 New	ACK200	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Dimensions (mm) r_ε	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●							0.4	4
080308PZER-L		●	●	●	●	●	●	●							0.8	4
SOMT 080304PZER-G		●	●	●	●	●	●	●							0.4	4
080308PZER-G		●	●	●	●	●	●	●							0.8	4
080312PZER-G		●	●	●	●	●	●	●							1.2	4
SOMT 080308PZER-H		●	●	●	●	●	●	●							0.8	4
080312PZER-H		●	●	●	●	●	●	●							1.2	4
SOET 080304PZER-G		●	●	●	●	●	●	●					●		0.4	4
080308PZER-G		●	●	●	●	●	●	●					●		0.8	4
080312PZER-G		●	●	●	●	●	●	●					●		1.2	4
SOET 080302PZFR-S									●		●				0.2	4
080304PZFR-S									●		●				0.4	4
080308PZFR-S									●		●				0.8	4
XOEW 080308PZTR-W						●							●		—	5

Fig 4

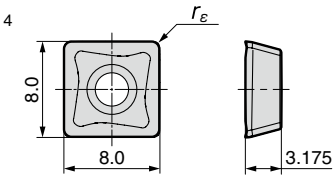
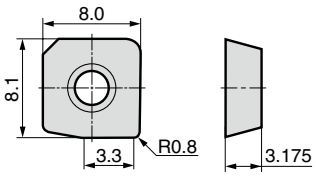
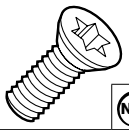
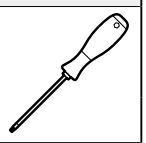


Fig 5 Wiper Insert H75(Be careful during installation)



■ Parts

screw		Spanner
	N·m	
BFTX0306IP	2.0	TRDR08IP

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max	Feed Rate f_z (mm/t) Min. - **Optimum** - Max	D.O.C. (mm)	Grades
P	General Steel	180 to 280HB	150-**200**-250	0.08-**0.12**-0.18	<6	ACP200 ACP300
	Soft Steel	≤180HB	180-**250**-350	0.10-**0.15**-0.20	<6	ACP200 ACP300
	Die Steel	200 to 220HB	100-**150**-200	0.08-**0.12**-0.18	<4	ACP200 ACP300
M	Stainless Steel	-	160-**200**-250	0.10-**0.15**-0.20	<6	ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	<6	ACK200 ACK300
N	Non-Ferrous Metal	-	300-**500**-1000	0.10-**0.15**-0.20	<6	H1 DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

WFXM08000R(S)Type

Rake Angle	Radial	−6°
	Axial	12°

6mm 90°

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

Shoulder Milling for Steel, Stainless Steel, Die Steel, Cast Iron, Non-Ferrous Alloys

New

Fig 1

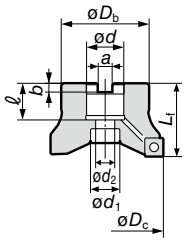


Fig 2

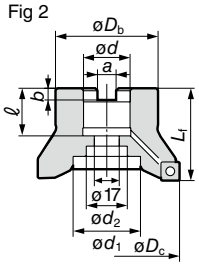
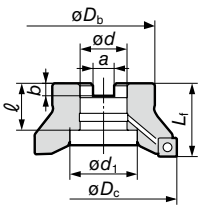


Fig 3



Body (Fine Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. 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	7	25	20	14	8	1.0	1
	08100RS	●	100	70	50	32	14.4	8	32	46	—	10	1.4	3
Imperial	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 not included. Check the collet attachment size (ød) when selecting the cutter.

* Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

IdentificationDetails

WFX M 08 040 R S

(1) Cutter Series; (2) M: Fine Pitched F: Extra-Fine Pitched; (3) Insert Size; (4) Cutter; (5) Direction; (6) Metric Bore

Insert

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		MS		KN		N					
	General Purpose		PM	PM	K		MS	MS			N		P			
	Roughing		PM	PM		K		MS					P			
Cat. No.		ACP100	ACP200 New	ACP300 New	ACK200	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Dimensions (mm) r_ε	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●							0.4	4
080308PZER-L		●	●	●	●	●	●	●							0.8	4
SOMT 080304PZER-G		●	●	●	●	●	●	●							0.4	4
080308PZER-G		●	●	●	●	●	●	●							0.8	4
080312PZER-G		●	●	●	●	●	●	●							1.2	4
SOMT 080308PZER-H		●	●	●	●	●	●	●							0.8	4
080312PZER-H		●	●	●	●	●	●	●							1.2	4
SOET 080304PZER-G		●	●	●	●	●	●	●					●		0.4	4
080308PZER-G		●	●	●	●	●	●	●					●		0.8	4
080312PZER-G		●	●	●	●	●	●	●					●		1.2	4
SOET 080302PZFR-S									●		●				0.2	4
080304PZFR-S									●		●				0.4	4
080308PZFR-S									●		●				0.8	4
XOEW 080308PZTR-W						●							●		—	5

Fig 4

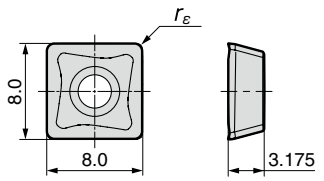
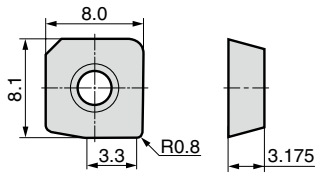
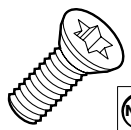
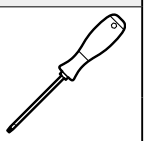


Fig 5 Wiper Insert H75 (Recommended turning application)



Parts

screw		Spanner
		
BFTX0306IP	2.0	TRDR08IP

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max	Feed Rate f_z (mm/t) Min. - **Optimum** - Max	D.O.C. (mm)	Grades
P	General Steel	180 to 280HB	150-**200**-250	0.08-**0.12**-0.18	<6	ACP200 ACP300
	Soft Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	<6	ACP200 ACP300
	Die Steel	200 to 220HB	100-**150**-200	0.08-**0.12**-0.18	<4	ACP200 ACP300
M	Stainless Steel	-	160-**200**-250	0.10-**0.15**-0.20	<6	ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	<6	ACK200 ACK300
N	Non-Ferrous Metal	-	300-**500**-1000	0.10-**0.15**-0.20	<6	H1 DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

WFXF08000R(S)Type

Rake Angle		
	Radial	−6°
	Axial	12°

6mm 90°

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

Shoulder Milling for Steel, Stainless Steel, Die Steel, Cast Iron, Non-Ferrous Alloys

New

Fig 1

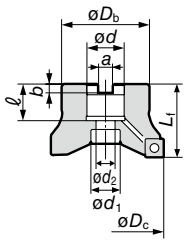


Fig 2

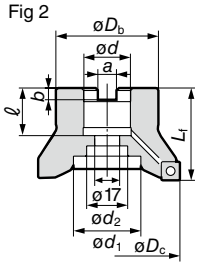
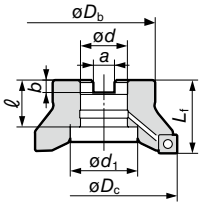


Fig 3



Body (Extra-Fine Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. 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	7	25	20	14	10	0.9	1
	08100RS	●	100	70	50	32	14.4	8	32	46	—	12	1.4	3
Imperial	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 not included. Check the collet attachment size (ød) when selecting the cutter.

* Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

IdentificationDetails

WFX M 08 040 R S

(1) Cutter Series
(2) M: Fine Pitched F: Extra-Fine Pitched
(3) Insert Size
(4) Cutter
(5) Direction
(6) Metric Bore

Insert

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		MS		KN		N					
	General Purpose		PM	PM	K		MS	MS			N		P			
	Roughing		PM	PM		K		MS								
Cat. No.		ACP100	ACP200 New	ACP300 New	ACK200	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Dimensions (mm) rε	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●							0.4	4
080308PZER-L		●	●	●	●	●	●	●							0.8	4
SOMT 080304PZER-G		●	●	●	●	●	●	●							0.4	4
080308PZER-G		●	●	●	●	●	●	●							0.8	4
080312PZER-G		●	●	●	●	●	●	●							1.2	4
SOMT 080308PZER-H		●	●	●	●	●	●	●							0.8	4
080312PZER-H		●	●	●	●	●	●	●							1.2	4
SOET 080304PZER-G		●	●	●	●	●	●	●					●		0.4	4
080308PZER-G		●	●	●	●	●	●	●					●		0.8	4
080312PZER-G		●	●	●	●	●	●	●					●		1.2	4
SOET 080302PZFR-S									●		●				0.2	4
080304PZFR-S									●		●				0.4	4
080308PZFR-S									●		●				0.8	4
XOEW 080308PZTR-W						●							●		—	5

Fig 4

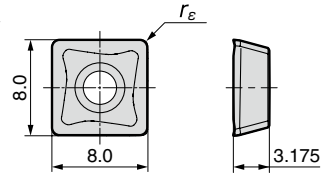
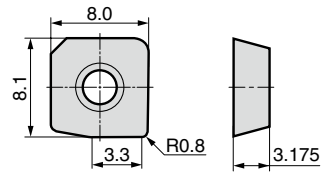
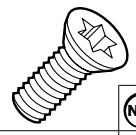
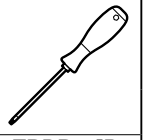


Fig 5 Wiper Insert H75 (Be careful during installation)



Parts

screw	Spanner
	
BFTX0306IP	TRDR08IP
N·m 2.0	

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max	Feed Rate f_z (mm/t) Min. - **Optimum** - Max	D.O.C. (mm)	Grades
P	General Steel	180 to 280HB	150-**200**-250	0.08-**0.12**-0.18	<6	ACP200 ACP300
	Soft Steel	≤ 180HB	180-**250**-350	0.10-**0.15**-0.20	<6	ACP200 ACP300
	Die Steel	200 to 220HB	100-**150**-200	0.08-**0.12**-0.18	<4	ACP200 ACP300
M	Stainless Steel	-	160-**200**-250	0.10-**0.15**-0.20	<6	ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	<6	ACK200 ACK300
N	Non-Ferrous Metal	-	300-**500**-1000	0.10-**0.15**-0.20	<6	H1 DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

SEC-Wave Mill

WFX12000R(S) Type

Rake Radial Angle		
	Radial	−8°
	Axial	8°

10mm 90°

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

Shoulder Milling for Steel, Stainless Steel, Die Steel, Cast Iron, Non-Ferrous Alloys

Expansion

Fig 1

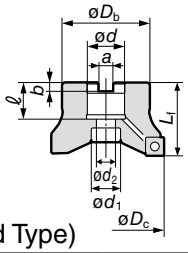


Fig 2

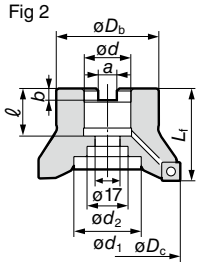


Fig 3

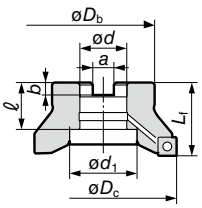


Fig 4

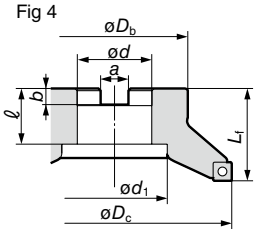
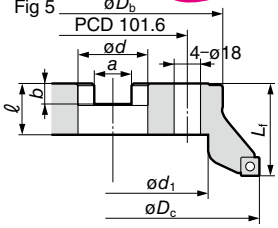


Fig 5



Body (Standard Type)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Metric	**WFX 12050RS**	●	**50**	40	40	**22**	10.4	6.3	20	18	11	3	0.2	1
	12063RS	●	**63**	50	40	**22**	10.4	6.3	20	18	11	4	0.4	1
	12080RS	●	*80	60	50	**27**	12.4	7	25	20	13.5	4	0.9	1
	12100RS	●	**100**	70	50	**32**	14.4	8.5	32	46	—	5	1.3	3
Imperial	**WFX 12080R**	●	*80	60	50	**25.4**	9.5	6	25	20	13	4	0.9	1
	12100R	●	*100	70	63	**31.75**	12.7	8	32.5	46	28	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	28	72	—	8	3.7	4
	12200R	●	**200**	150	63	**47.625**	25.4	14	35	130	—	10	6.3	5
	12250R	●	**250**	190	63	**47.625**	25.4	14	35	150	—	12	11.0	5

Inserts are not included. *Sizes ø160 mm or above do not have coolant holes.

＊Please use JIS B1176 hexagonal bolt (ϕ80: M12x30 to 35mm, ϕ100: M16x40 to 45mm) for securing ϕ80/ϕ100mm cutter to the arbour.

Identification Details

WFX 12 050 R S

(1) Cutter Series | (2) Insert Size | (3) Cutter | (4) Direction | (5) Metric Bore

Inserts

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		MS		KN		N					
	General Purpose		PM	PM	K		MS	MS			N		P			
	Roughing		PM	PM		K		MS								
Cat. No.		ACP100	ACP200 New	ACP300 New	ACK200	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Dimensions (mm) r_ε	Fig
SOMT 120408PDER-L		●	●	●	●	●	●	●	—		—		—		0.8	6
SOMT 120404PDER-G		●	●	●	●	●	●	●	—		—		—		0.4	6
120408PDER-G		●	●	●	●	●	●	●	—		—		●		0.8	6
120412PDER-G		●	●	●	●	●	●	●	—		—		—		1.2	6
120416PDER-G		●	●	●	●	●	●	●	—		—		—		1.6	6
SOMT 120408PDER-H		●	●	●	●	●	●	●	—		—		—		0.8	6
SOET 120408PDFR-S		—	—	—	—	—			●		●		—		0.8	6
XOEW 120408PDTR-W		—	—	—	—	●			—		—		●		—	7

Fig 6

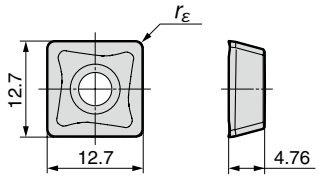
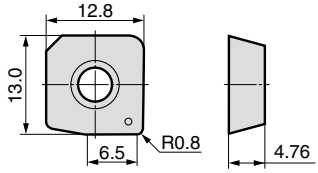
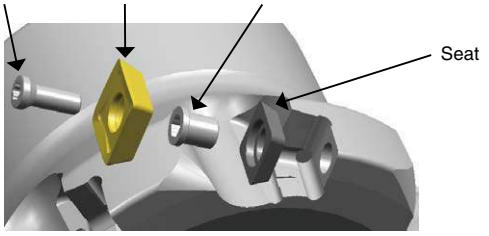
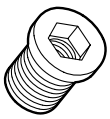
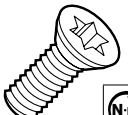
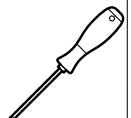
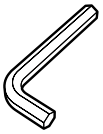


Fig 7 Wiper Insert (H75)Be careful during installation.)





Spare Parts

Seat	Seat Screw	Insert Screw	Wrench (insert)	Wrench (seat)
				
WFXS4R	BW0507F	BFTX03512IP	3.0	TRDR15IP	LH035

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed V_c (m/min) Min. - **Optimum** - Max	Feed Rate f_z (mm/t) Min. - **Optimum** - Max	D.O.C. (mm)	Grades
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.15**-0.20	<10	ACP200 ACP300
	Soft Steel	≤180HB	180-**250**-350	0.10-**0.15**-0.20	<10	ACP200 ACP300
	Die Steel	200 to 220HB	100-**150**-200	0.10-**0.15**-0.20	<6	ACP200 ACP300
M	Stainless Steel	-	160-**200**-250	0.10-**0.15**-0.20	<10	ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	<10	ACK200 ACK300
N	Non-Ferrous Alloy	-	300-**500**-1000	0.10-**0.15**-0.20	<10	H1 DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

●mark: Standard stocked item (expanded item)

WFXF12000R(S) Type

Rake Radial Angle		
Radial	−8°	
Axial	8°	

10mm 90°

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminum ◎ | S Exotic Alloy ○ | H Hardened Steel

Shoulder Milling for Steel, Stainless Steel, Die Steel, Cast Iron, Non-Ferrous Alloys

Expansion

Fig 1

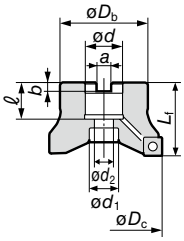


Fig 2

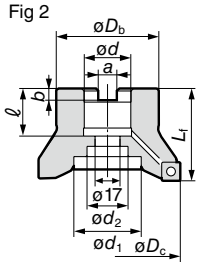


Fig 3

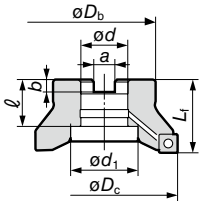


Fig 4

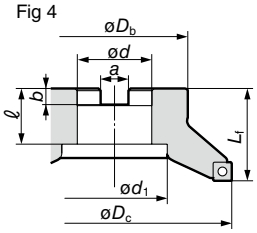
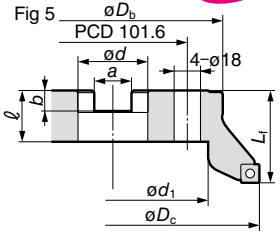


Fig 5



■ Body (Extra-Fine Pitch)

	Cat. No.	Stock	Dimensions (mm) øDc	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. of Teeth	Weight (kg)	Fig
Metric	WFXF 12050RS	●	50	40	40	22	10.4	6.3	20	18	11	4	0.2	1
	12063RS	●	63	50	40	22	10.4	6.3	20	18	11	5	0.4	1
	12080RS	●	*80	60	50	27	12.4	7	25	20	13.5	6	0.9	1
	12100RS	●	100	70	50	32	14.4	8.5	32	46	—	7	1.2	3
Imperial	WFXF 12080R	●	*80	60	50	25.4	9.5	6	25	20	13	6	0.9	1
	12100R	●	*100	70	63	31.75	12.7	8	32.5	46	28	7	1.6	2
	12125R	●	125	80	63	38.1	15.9	10	35.5	55	30	8	2.4	1
	12160R	●	160	100	63	50.8	19.1	11	28	72	—	12	3.5	4
	12200R	●	200	150	63	47.625	25.4	14	35	130	—	16	6.2	5
	12250R		250	190	63	47.625	25.4	14	35	150	—	18	10.9	5

Inserts are not included. *Sizes ø160 mm or above do not have coolant holes.

* Please use JIS B1176 hexagonal bolt (ϕ80: M12x30 to 35mm, ϕ100: M16x40 to 45mm) for securing ϕ80/ϕ100mm cutter to the arbour.

■ Identification Details

WFX 12 050 R S

(1) Cutter Series | (2) Insert Size | (3) Cutter | (4) Direction | (5) Metric Bore

■ Inserts

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		M S		K N		N					
	General Purpose		P M	P M	K		M S	M S			N		P			
	Roughing		P M	P M		K		M S								
Cat. No.		ACP100	ACP200 New	ACP300 New	ACK200	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A New		Dimensions (mm) rε	Fig
SOMT 120408PDER-L		●	●	●	●	●	●	●	—		—		—		0.8	6
SOMT 120404PDER-G		●	●	●	●	●	●	●	—		—		—		0.4	6
120408PDER-G		●	●	●	●	●	●	●	—		—		●		0.8	6
120412PDER-G		●	●	●	●	●	●	●	—		—		—		1.2	6
120416PDER-G		●	●	●	●	●	●	●	—		—		—		1.6	6
SOMT 120408PDER-H		●	●	●	●	●	●	●	—		—		—		0.8	6
SOMT 120408PDFR-S		—	—	—	—	—			●		●		—		0.8	6
XOMT 120408PDER-W		—	—	—	—	●			—		—		●		—	7

Fig 6

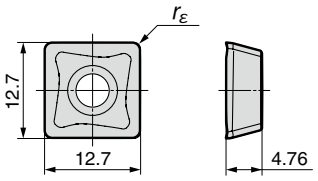
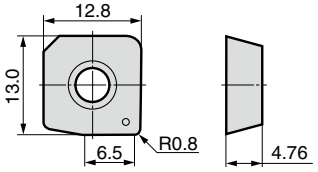
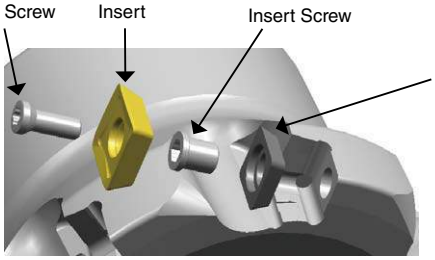
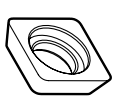
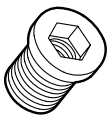
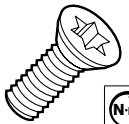
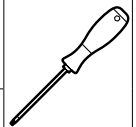
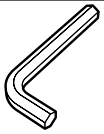


Fig 7 Wiper Insert (H75)Be careful during installation.)





■ Spare Parts

Seat	Seat Screw	Insert Screw		Wrench (insert)	Wrench (seat)
			N·m		
WFXS4R	BW0507F	BFTX03512IP	3.0	TRDR15IP	LH035

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max	Feed Rate f_z (mm/t) Min. - **Optimum** - Max	D.O.C. (mm)	Grades
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.15**-0.20	<10	ACP200 ACP300
	Soft Steel	≤180HB	180-**250**-350	0.10-**0.15**-0.20	<10	ACP200 ACP300
	Die Steel	200 to 220HB	100-**150**-200	0.10-**0.15**-0.20	<6	ACP200 ACP300
M	Stainless Steel	-	160-**200**-250	0.10-**0.15**-0.20	<10	ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	<10	ACK200 ACK300
N	Non-Ferrous Alloy	-	300-**500**-1000	0.10-**0.15**-0.20	<10	H1 DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

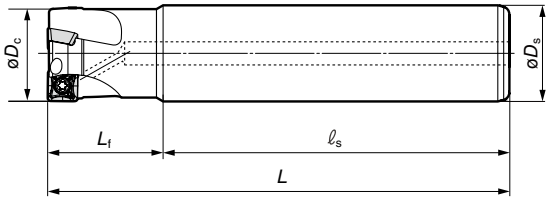
WFX(M)08000E Type

Rake Angle		
	Radial	−6°
	Axial	12°

6mm 90°

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminum ◎ | S Exotic Alloy ○ | H Hardened Steel

Shoulder Milling for Steel, Stainless Steel, Die Steel, Cast Iron, Non-Ferrous Alloys



New

Modular Type ☞ H129

Body (Standard Pitch)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth
WFX 08020E-16	●	20	16	30	80	110	2
WFX 08020E	●	20	20	30	80	110	2
08022E	●	22	20	30	90	120	2
WFX 08025E-20	●	25	20	30	90	120	2
WFX 08025E	●	25	25	30	90	120	2
08028E	●	28	25	30	90	120	2
08030E	●	30	25	30	90	120	3
WFX 08032E	●	32	32	30	90	120	3
08033E	●	33	32	30	90	120	3
08040E	●	40	32	30	90	120	3
08050E	●	50	32	30	90	120	4
08063E	●	63	32	30	90	120	5

Inserts are not included.

Body (Fine Pitch)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth
WFXM 08025E	●	25	25	30	90	120	3
WFXM 08032E	●	32	32	30	90	120	4
08040E	●	40	32	30	90	120	4
08050E	●	50	32	30	90	120	5
08063E	●	63	32	30	90	120	6

Inserts are not included.

Identification Details

WFX M 08 025 E

(1) Cutter Series | (2) Fine-Pitched | (3) Insert Size | (4) Cutter | (5) Endmill Type

Insert

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		M S		K N		N					
	General Purpose		P M	P M	K		M S	M S			N		P			
	Roughing		P M	P M		K		M S								
Cat. No.		ACP100	ACP200 New	ACP300 New	ACK200	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Dimensions (mm) r_ε	Fig
SOMT 080304PZER-L		●	●	●	●	●	●	●							0.4	4
080308PZER-L		●	●	●	●	●	●	●							0.8	4
SOMT 080304PZER-G		●	●	●	●	●	●	●							0.4	4
080308PZER-G		●	●	●	●	●	●	●							0.8	4
080312PZER-G		●	●	●	●	●	●	●							1.2	4
SOMT 080308PZER-H		●	●	●	●	●	●	●							0.8	4
080312PZER-H		●	●	●	●	●	●	●							1.2	4
SOET 080304PZER-G		●	●	●	●	●	●	●					●		0.4	4
080308PZER-G		●	●	●	●	●	●	●					●		0.8	4
080312PZER-G		●	●	●	●	●	●	●					●		1.2	4
SOET 080302PZFR-S									●		●				0.2	4
080304PZFR-S									●		●				0.4	4
080308PZFR-S									●		●				0.8	4
XOEW 080308PZTR-W						●							●		—	5

Fig 4

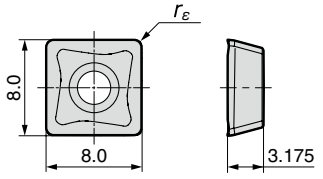
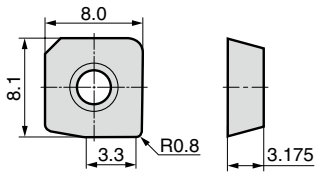
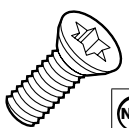
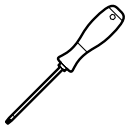


Fig 5 Wiper Insert ☞ H75(Be careful during installation.)



Parts

Insert Screw		Spanner
		
BFTX0306IP	2.0	TRDR08IP

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max	Feed Rate f_z (mm/t) Min. - **Optimum** - Max	D.O.C. (mm)	Grades
P	General Steel	180 to 280HB	150-**200**-250	0.08-**0.12**-0.18	<6	ACP200 ACP300
P	Soft Steel	≤180HB	180-**250**-350	0.10-**0.15**-0.20	<6	ACP200 ACP300
P	Die Steel	200 to 220HB	100-**150**-200	0.08-**0.12**-0.18	<4	ACP200 ACP300
M	Stainless Steel	-	160-**200**-250	0.10-**0.15**-0.20	<6	ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	<6	ACK200 ACK300
N	Non-Ferrous Metal	-	300-**500**-1000	0.10-**0.15**-0.20	<6	H1 DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

WFX(F)12000E Type

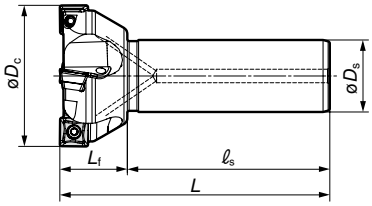
Rake Angle		
	Radial	−8°
	Axial	8°

10mm 90°

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

Shoulder Milling for Steel, Stainless Steel, Die Steel, Cast Iron, Non-Ferrous Alloys

Expansion



Body (Standard Pitch)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth
WFX 12040E	●	**40**	32	30	90	120	3
12050E	●	**50**	32	30	90	120	3
12063E	●	**63**	32	30	90	120	4
12080E	●	**80**	32	30	90	120	4

Inserts are not included. ø40 mm sizes do not have a seat.

Body (Extra-Fine Pitch)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth
WFXF 12050E	●	**50**	32	30	90	120	4
12063E	●	**63**	32	30	90	120	5
12080E	●	**80**	32	30	90	120	6

Inserts are not included.

Identification Details

WFX F 12 050 E

(1) Cutter Series | (2) Fine-Pitched | (3) Insert Size | (4) Cutter | (5) Endmill Type

Insert

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

Grade		Coated Carbide							Carbide		DLC		Cermet			
Application	High Speed/Light	P			K		M S		K N		N					
	General Purpose		P M	P M	K		M S	M S			N		P			
	Roughing		P M	P M		K		M S								
Cat. No.		ACP100	ACP200 New	ACP300 New	ACK200	ACK300 New	ACM200 New	ACM300 New	H1		DL1000		T4500A		Dimensions (mm) r_ε	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

Fig 1

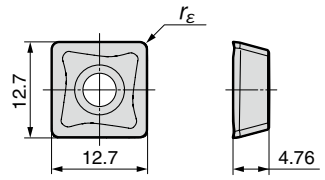
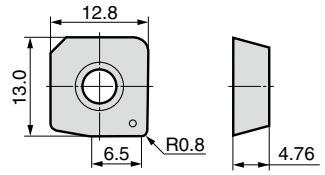
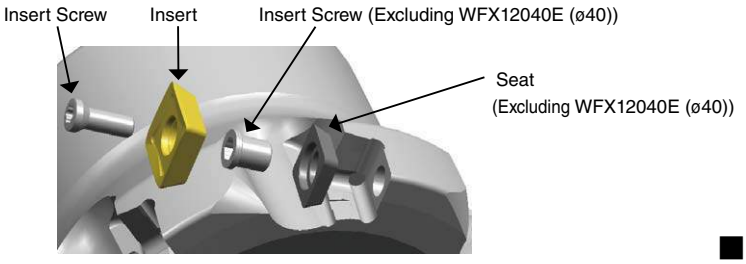
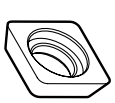
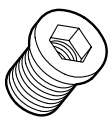
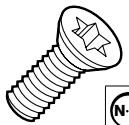
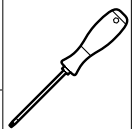
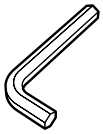


Fig 2 Wiper Insert (H13)Be careful during installation.)





Spare Parts

Seat	Seat Screw	Insert Screw		Wrench (insert)	Wrench (seat)
			N·m		
WFXS4R	BW0507F	BFTX03512IP	3.0	TRDR15IP	LH035

N·m Recommended Tightening Torque (N·m)

ø40 mm sizes do not have a seat.

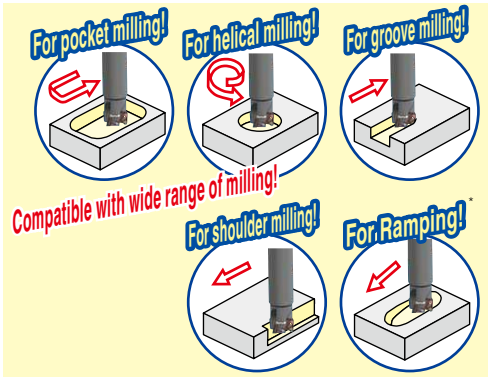
Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max	Feed Rate f_z (mm/t) Min. - **Optimum** - Max	D.O.C. (mm)	Grades
P	General Steel	180 to 280HB	150-**200**-250	0.10-**0.15**-0.20	<10	ACP200 ACP300
P	Soft Steel	≤180HB	180-**250**-350	0.10-**0.15**-0.20	<10	ACP200 ACP300
P	Die Steel	200 to 220HB	100-**150**-200	0.10-**0.15**-0.20	<6	ACP200 ACP300
M	Stainless Steel	-	160-**200**-250	0.10-**0.15**-0.20	<10	ACM300
K	Cast Iron	250HB	100-**175**-250	0.10-**0.15**-0.20	<10	ACK200 ACK300
N	Non-Ferrous Metal	-	300-**500**-1000	0.10-**0.15**-0.20	<10	H1 DL1000

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

● mark: Standard stocked item (expanded item)

WEX Type



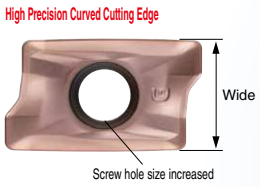
*Ramping angle depends on the cutter diameter. Please refer to the following table.

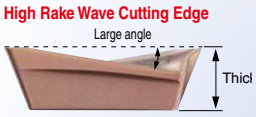
Tool Dia.	Ramp Angle	
	2000 Type	3000 Type
ø14	1°40'	
ø16	1°20'	
ø20	1°	
ø25	0°45'	1°30'
ø32	0°35'	1°
ø40	0°25'	0°45'
ø50	0°20'	0°30'
ø63	0°15'	0°20'
ø80		0°15'
From ø100		Impossible

■ Characteristics

Precision Insert with Strong Cutting Edge and Low Cutting Force Design

- Unique curved cutting edge design lowers cutting force yet improves cutting edge strength.
- Achieving high quality finish with high precision cutting edge
- Smooth cutting even for deep grooves and low rigidity machines.





Wide Variety of Inserts

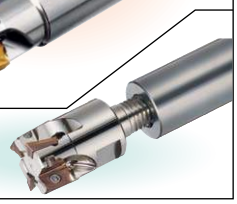
- 6 types of chipbreakers. (L, G, H, E, EH, S Types)
- 7 new milling grades available for a wide range of work materials.

(Steel Milling Grades)
ACP100,ACP200,ACP300
(Cast Iron Milling Grades)
ACK200,ACK300
(Stainless Steel・Exotic Alloy+Gradet)
ACM200 New, ACM300 New
(Aluminium Milling Grades)
DL1000,H1

Highly Durable Body

- Special surface treatment improves corrosion resistance and scratch resistance.
- Increased screw size improves clamping force and durability.
- Improved chip evacuation with air or coolant supply.

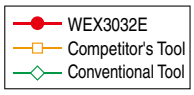
■ Product Range

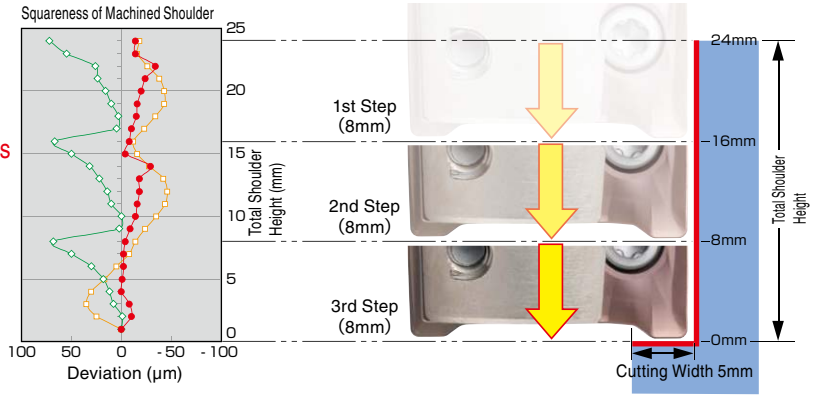
	Cat. No.	Description	External Diameter (mm) ø10 ø25 ø40 ø50 ø63 ø80 ø125	Shape
Shell Type H88	WEX 2000F	Standard Type	40–63	
	WEX 3000F	Standard Type	40–63	
	WEX 3000R	Standard Type	80–125	
	WEXF 3000R	Fine Pitch Type	80–125	
Shank Type H90	WEX 2000E	Standard Type	14–63	
	WEX 2000EL	Long Type	14–40	
	WEX 3000E	Standard Type	25–63	
	WEX 3000ES	Short Type	50–63	
	WEX 3000EL	Long Type	25–40	
	WEX 3000E-C	Coarse Pitch Type	40–63	
	WEX 3000ES-C	Short, Coarse Pitch Type	50–63	
Modular Type H130	WEX 2000M	Modular Type	16–40	
	WEX 3000M	Modular Type	25–40	

■ Cutting Performance

(1) Shoulder milling with better squareness

High accuracy cutting edges provide very small step marks
(Less than half of competitor's)

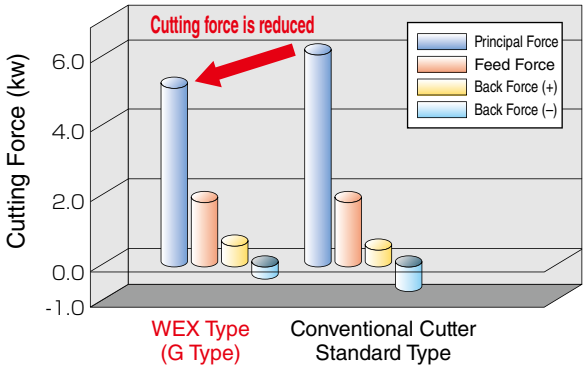




(Cutting Conditions)
Work Material : SS400
Tool : WEX3032E(ø32)
Insert : AXMT170508PEER-G
Grade : ACP200
Cutting Speed : V_c=150m/min
Feed Rate : f_z=0.15mm/t (v_f=675mm/min)
Cutting Width : a_e=5mm
Cutting Depth : a_p=8mm×3 Passes Dry

(2) Cutting Force

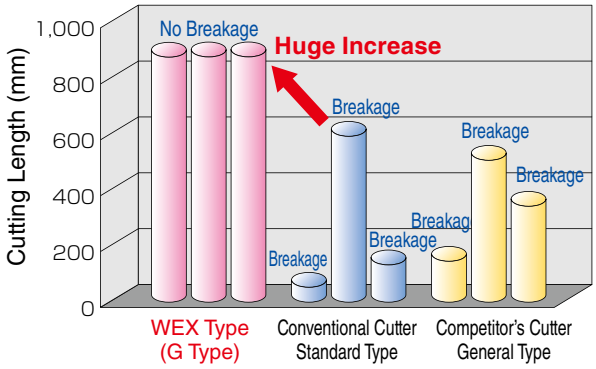
Cutting resistance (main component) is approx 15% lower than conventional cutters.



(Cutting Conditions)
Work Material : S50
Tool : WEX3032E(ø32)
Insert : AXMT170508PEER-G
Grade : ACP200
Cutting Speed : V_c=100m/min
Feed Rate : f_z=0.2mm/t (v_f=1,200mm/min)
Cutting Width : a_e=8mm
Cutting Depth : a_p=10mm Dry

(3) Fracture Resistance

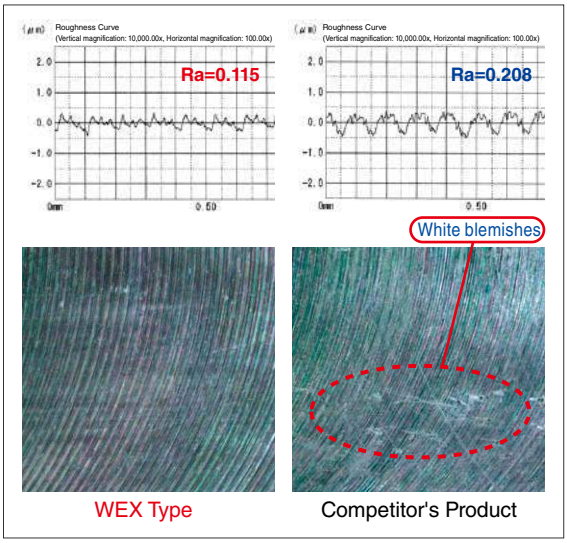
Huge increase in fracture resistance with improved cutting edge strength.



(Cutting Conditions)
Work Material : SCM440
Tool : WEX3032E(ø32)
Insert : AXMT170508PEER-G
Grade : ACP200
Cutting Speed : V_c=100m/min
Feed Rate : f_z=0.4mm/t (v_f=1,260mm/min)
Cutting Width : a_e=25mm
Cutting Depth : a_p=3mm Dry

(4) Surface Finish (Aluminum Milling)

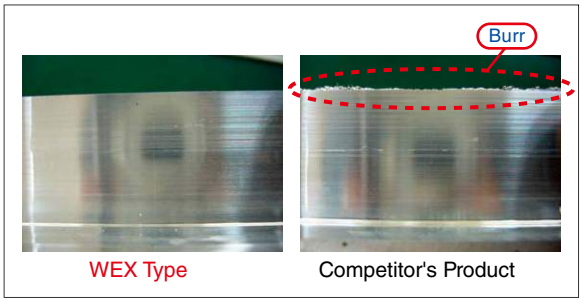
Smooth surface free of white blemishes



(Cutting Conditions)
Work Material : A5052
Tool : WEX3032E(ø32)
Insert : AXET170504PEFR-S(H1)
Cutting Speed : V_c=800m/min
Feed Rate : f_z=0.1mm/t (v_f=2,400mm/min)
Cutting Width : a_e=16mm
Cutting Depth : a_p=10mm Dry

(5) Burr on Machined Shoulder (Aluminum Milling)

High rake edge type significantly reduces burr.

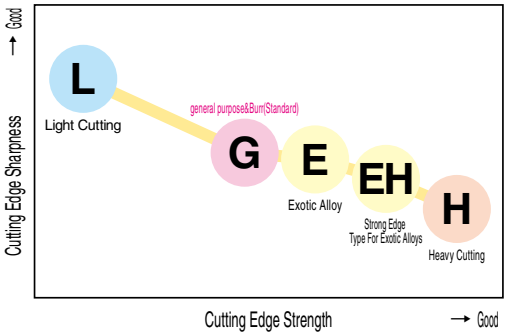


(Cutting Conditions)
Work Material : A5052
Tool : WEX3032E(ø32)
Insert : AXET170504PEFR-S(H1)
Cutting Speed : V_c=800m/min
Feed Rate : f_z=0.1mm/t (v_f=2,400mm/min)
Cutting Width : a_e=5mm
Cutting Depth : a_p=12mm Dry

WEX Type

Chipbreaker Selection

■ Chipbreaker Map

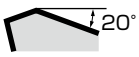
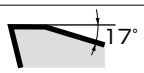
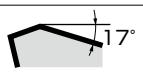
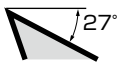
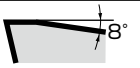
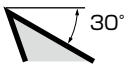


Stainless Steel · For Exotic Alloyl machining

E Type Chipbreaker

For 2000 Type
R0.4 / R1.2

For 3000 Type
R0.4 / R1.2 / R1.6 / R2.0 / R3.0

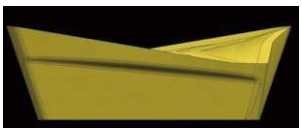
Work Material	P Steel K Cast Iron			M Stainless Steel S Exotic Alloy		N Non-Ferrous
	L Type	G Type	H Type	E Type	EHType	S Type
Breaker						
Feature	Low Cutting Force	General Purpose	Strong Edge	General-Purpose Type For Exotic Alloys	Strong Edge Type For Exotic Alloys	High Rake Type
2000 Type Insert Figure	Not Available					
3000 Type Insert Figure						
Application	Light cut, low rigidity milling and reduce burrs	**Main breaker** General purpose to interrupted milling	Roughing, heavy interrupted and hardened steel milling	Light Cutting to General-Purpose	Heavy Interrupted Machining	Non-Ferrous Metal

Stainless Steel・Exotic Alloy+Breaker E/EH Type

■ Characteristics of E/EH Type Chipbreaker

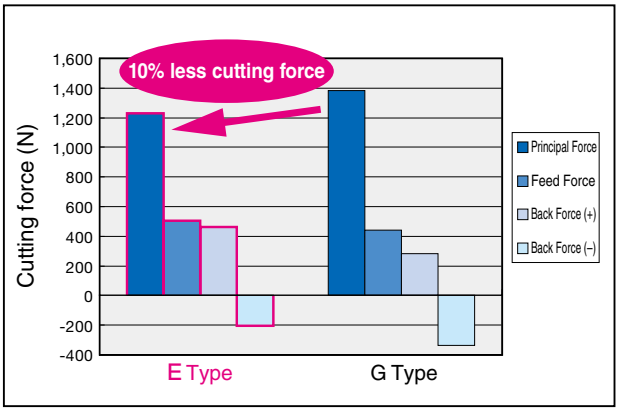
① Improved Adhesion Resistance
Smooth cutting edge design allows smooth chip flow

② Improved Cutting Performance
Strong cutting edge realized by optimizing edge treatment and rake angle


E/EH Type

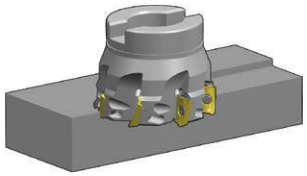

L/G Type

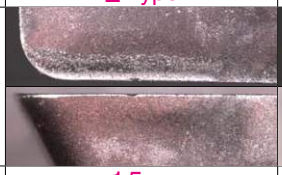
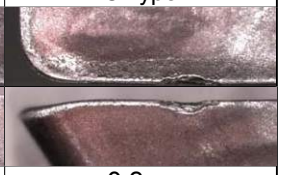
■ Performance Comparison



Cutting Conditions
Work Material: SUS304
Tool: WEX2050F
V_c=180m/min f_z=0.15mm/t a_e=20mm a_p=3mm Dry

■ Tool Life Comparison



	E Type	G Type
Damage		
Cutting Length	1.5 m	0.9 m

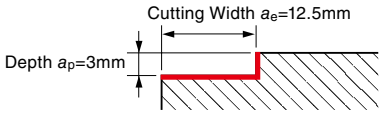
Cutting Conditions
Work Material: SUS304
Tool: WEX2050F
V_c=120m/min f_z=0.15mm/t a_e=20mm a_p=3mm Dry

■ Recommended Cutting Conditions

WEX2000 Type

Tool: WEX2025E Insert: AXMT123508PEER-G

Cutting Conditions: Depth 3mm, Cutting Width 12.5mm, Dry



ISO Classification	Work Material		Work Hardness (HB)	Chipbreaker	Grades																							
					ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
					Feed f_z (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 v_c (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	SUS403 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, Ti Alloy, etc.)		330	E																35	25		30	20				
N	Aluminium Alloy, Si < 12.6%			S																						1000	750	500
	Aluminium Alloy, Si > 12.6%			S																						250	200	170
	Copper Alloy			S																						350	330	300

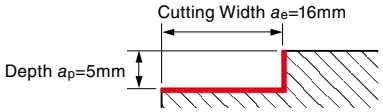
● The recommended cutting conditions may not be practical under certain operating conditions (i.e., machine, work shape, clamping system).
● For groove milling, adjust feed rate to around 70% of the above values.

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

WEX3000 Type

Tool: WEX3032E Insert: AXMT170508PEER-G

Cutting Conditions: Depth 5mm, Cutting Width 16mm, Dry



ISO Classification	Work Material		Work Hardness (HB)	Chipbreaker	Grades																							
					ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
					Feed f_z (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 v_c (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	SUS403 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, Ti Alloy, etc.)		330	E													50	30		50	30		45	25				
N	Aluminium Alloy, Si < 12.6%			S																						1000	750	500
	Aluminium Alloy, Si > 12.6%			S																						250	200	170
	Copper Alloy			S																						350	330	300

● The recommended cutting conditions may not be practical under certain operating conditions (i.e., machine, work shape, clamping system).
● For groove milling, adjust 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, cutting depth, and other factors.

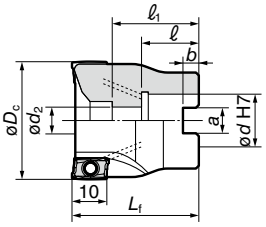
WEX 2000F Type

Rake Angle		
	Radial	16° to 18°
	Axial	23° to 25°

10mm 90°

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminum ◎ | S Exotic Alloy ◎ | H Hardened Steel

High Efficiency Machining for Steel, Stainless Steel, Cast Iron, Exotic Alloy , and Non-Ferrous Metal



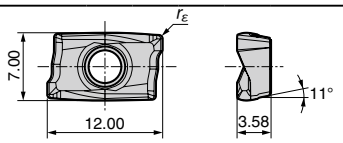
Body (Standard Type) Metric

	Cat. No.	Stock	Dimensions (mm) øDc	ød	ød2	a	b	Lf	ℓ1	ℓ	No. of Teeth	Weight (kg)
Metric	WEX 2040F	●	40	16	9	8.4	5.6	40	28	18	6	0.19
	2050F	●	50	22	11	10.4	6.3	40	26	20	7	0.29
	2063F	●	63	22	11	10.4	6.3	40	26	20	8	0.51

Inserts are not included.

Inserts

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



Grade		Coated Carbide							Carbide	DLC	
Application	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	New ACM200	New ACM300	H1	DL1000	Dimensions rε
AXMT 123504PEER-G		●	●	●	●	●			—	—	0.4
123508PEER-G		●	●	●	●	●			—	—	0.8
123512PEER-G		●	●	●	●	●			—	—	1.2
AXMT 123504PEER-H		●	●	●	●	●			—	—	0.4
123508PEER-H		●	●	●	●	●			—	—	0.8
123512PEER-H		●	●	●	●	●			—	—	1.2
AXMT 123504PEER-E							●	●	—	—	0.4
123508PEER-E				▲			●	●	—	—	0.8
123512PEER-E							●	●	—	—	1.2
AXMT 123508PEER-EH				▲			●	●	—	—	0.8
AXET 123502PEFR-S		—	—	—	—	—	—	—	●	●	0.2
123504PEFR-S		—	—	—	—	—	—	—	●	●	0.4
123508PEFR-S		—	—	—	—	—	—	—	●	●	0.8

Spare Parts

Screw		Spanner	Anti-seizure Cream
			
BFTX0306IP	2.0	TRDR08IP	SUMI-P

N·m Recommended Tightening Torque (N · m)

RecommendedCutting Conditions H87

● mark : Standard stocked item (expanded item) ▲ mark : To be replaced by new item (Please confirm stock availability)

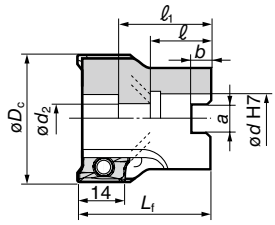
WEX 3000F/R WEXF 3000R Type

Rake Angle	
Radial	12° to 15°
Axial	29° to 24°

14mm 90°

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

High Efficiency Machining for Steel, Stainless Steel, Cast Iron, Exotic Alloy , and Non-Ferrous Metal



Body (Standard Type)

	Cat. No.	Stock	Dimensions (mm) øDc	ød	ød2	a	b	Lf	ℓ1	ℓ	No. of Teeth	Weight (kg)
Metric	**WEX 3040F**	●	**40**	**16**	9	8.4	5.6	40	28	18	4	0.16
	3050F	●	**50**	**22**	11	10.4	6.3	40	26	20	5	0.25
	3063F	●	**63**	**22**	11	10.4	6.3	40	26	20	6	0.48
Imperial	**WEX 3080R**	●	*80	**25.4**	13	9.5	6	50	31	25	4	1.06
	3100R	●	*100	**31.75**	17	12.7	8	63	39.5	32.5	5	1.99
	3125R	●	**125**	**38.1**	30	15.9	10	63	42.5	35.5	6	2.89

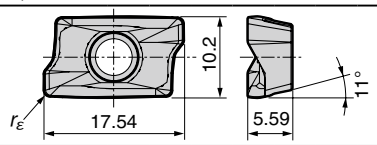
Body(Fine Pitch Type)

Imperial	**WEXF 3080R**	●	*80	**25.4**	13	9.5	6	50	31	25	7	0.98
	3100R	●	*100	**31.75**	17	12.7	8	63	39.5	32.5	8	1.91
	3125R	●	**125**	**38.1**	30	15.9	10	63	42.5	35.5	9	2.80

Inserts are not included.

*Please use JIS B1176 hexagonal bolt (ϕ80: M12x30 to 35mm, ϕ100: M16x40 to 45mm) for securing ϕ80/ϕ100 cutter to the arbour.

Inserts (Common) P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel



Grade		Coated Carbide							Carbide	DLC
Application	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 New	ACM300 New	H1	DL1000	Dimensions rε
AXMT 170508PEER-L	●	●	●	●	●			—	—	0.8
AXMT 170504PEER-G	●	●	●	●	●			—	—	0.4
170508PEER-G	●	●	●	●	●			—	—	0.8
170512PEER-G	●	●	●	●	●			—	—	1.2
170516PEER-G	●	●	●	●	●			—	—	1.6
170520PEER-G *	●	●	●	●	●			—	—	2.0
170530PEER-G *	●	●	●	●	●			—	—	3.0
AXMT 170508PEER-H	●	●	●	●	●			—	—	0.8
170512PEER-H	●	●	●	●	●			—	—	1.2
AXMT 170504PEER-E						●	●	—	—	0.4
170508PEER-E			▲			●	●	—	—	0.8
170512PEER-E						●	●	—	—	1.2
170516PEER-E						●	●	—	—	1.6
170520PEER-E *						●	●	—	—	2.0
170530PEER-E *						●	●	—	—	3.0
AXMT 170508PEER-EH			▲			●	●	—	—	0.8
AXET 170502PEFR-S	—	—	—	—	—	—	—	●	●	0.2
170504PEFR-S	—	—	—	—	—	—	—	●	●	0.4
170508PEFR-S	—	—	—	—	—	—	—	●	●	0.8

* Cutter body modification is required.

Spare Parts

Screw		Spanner	Anti-seizure Cream
			
BFTX0409IP	**3.0**	TRDR15IP	SUMI-P

Recommended Tightening Torque (N · m)

*Cutter body modification is required when attaching an R3.0 insert with a 2.0 nose radii.

Rework this edge.
Reworking guideines
For 2.0 nose radii: C1
(AXMT170520PEER)
For 3.0 nose radii: C1.5
(AXMT170530PEER)
Standard: C0.5.

RecommendedCutting Conditions H87

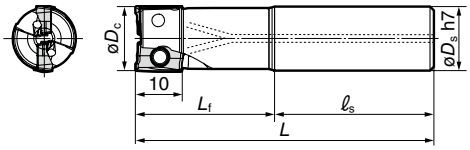
WEX 2000E/EL Type

Rake Angle		
	Radial	10° to 18°
	Axial	14° to 25°

10mm 90°

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminum ◎ | S Exotic Alloy ◎ | H Hardened Steel

High Efficiency Machining for Steel, Stainless Steel, Cast Iron, Exotic Alloy , and Non-Ferrous Metal



Body (Standard Type)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)
WEX 2014E	●	14	16	25	55	80	1	0.10
2016E	●	16	16	25	75	100	2	0.13
2018E	●	18	16	25	75	100	2	0.14
2020E	●	20	20	30	80	110	3	0.22
2022E	●	22	20	30	80	110	3	0.23
WEX 2025E	●	25	25	35	85	120	4	0.38
2028E	●	28	25	35	85	120	4	0.39
2030E	●	30	25	35	85	120	4	0.40
2032E	●	32	32	40	90	130	5	0.70
2040E	●	40	32	30	120	150	6	0.91
WEX 2050E	●	50	32	30	120	150	7	1.02
2063E	●	63	32	30	120	150	8	1.22

Inserts are not included.

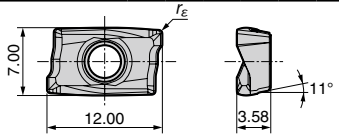
Body (Long Type)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)
WEX 2014EL	●	14	16	25	95	120	1	0.14
2016EL	●	16	16	25	120	145	2	0.19
2018EL	●	18	16	25	120	145	2	0.19
2020EL	●	20	20	40	110	150	2	0.32
2022EL	●	22	20	30	120	150	2	0.33
WEX 2025EL	●	25	25	50	120	170	2	0.55
2028EL	●	28	25	30	140	170	2	0.59
2030EL	●	30	25	30	140	170	2	0.60
2032EL	●	32	32	60	120	180	2	0.99
2040EL	●	40	32	30	150	180	2	1.12

Inserts are not included.

Inserts

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



Grade		Coated Carbide							Carbide	DLC	
Application	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	New ACM200	New ACM300	H1	DL1000	Dimensions rε
AXMT 123504PEER-G		●	●	●	●	●			—	—	0.4
123508PEER-G		●	●	●	●	●			—	—	0.8
123512PEER-G		●	●	●	●	●			—	—	1.2
AXMT 123504PEER-H		●	●	●	●	●			—	—	0.4
123508PEER-H		●	●	●	●	●			—	—	0.8
123512PEER-H		●	●	●	●	●			—	—	1.2
AXMT 123504PEER-E							●	●	—	—	0.4
123508PEER-E				▲			●	●	—	—	0.8
123512PEER-E							●	●	—	—	1.2
AXMT 123508PEER-EH				▲			●	●	—	—	0.8
AXET 123502PEFR-S		—	—	—	—	—	—	—	●	●	0.2
123504PEFR-S		—	—	—	—	—	—	—	●	●	0.4
123508PEFR-S		—	—	—	—	—	—	—	●	●	0.8

Spare Parts

Screw	Spanner	Anti-seizure Cream	Applicable Endmill
			
BFTX0305IP 2.0	TRDR08IP	SUMI-P	WEX2014E(EL)to WEX2018E(EL)
BFTX0306IP 2.0			WEX2020E(EL)to WEX2063E

N·m Recommended Tightening Torque (N·m)

RecommendedCutting Conditions H87

● mark : Standard stocked item (expanded item) ▲ mark : To be replaced by new item (Please confirm stock availability)

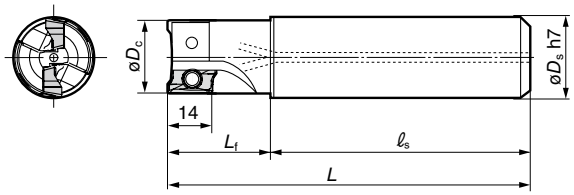
WEX 3000 E/ES/EL E-C/ES-CType

Rake Angle		
	Radial	8° to 15°
	Axial	16° to 24°

14mm 90°

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-ferrous Metal ◎ | N Aluminum ◎ | S Exotic Alloy ◎ | H Hardened Steel

High Efficiency Machining for Steel, Stainless Steel, Cast Iron, Exotic Alloy , and Non-Ferrous Metal



Body (Standard Type)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)
WEX 3025E-20	●	25	20	35	85	120	2	0.25
3025E	●	25	25	35	85	120	2	0.37
3028E	●	28	25	35	85	120	2	0.39
3030E	●	30	25	40	90	130	3	0.42
3032E-25	●	32	25	40	90	130	3	0.43
WEX 3032E	●	32	32	40	90	130	3	0.67
3035E	●	35	32	40	90	130	3	0.69
3040E	●	40	32	50	120	170	4	1.01
3050E	●	50	32	50	120	170	5	1.23
3063E	●	63	32	50	120	170	6	1.58

Body(Long Type)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Weight (kg)
WEX 3025EL	●	25	25	50	120	170	2	0.54
3028EL	●	28	25	50	120	170	2	0.56
3030EL	●	30	25	60	120	180	2	0.60
3032EL	●	32	32	60	120	180	2	0.95
3035EL	●	35	32	60	120	180	2	0.98
WEX 3040EL	●	40	32	80	140	220	2	1.38

Body(Coarse Pitch Type)

WEX 3040E-C	●	40	32	50	120	170	3	1.04
3050E-C	●	50	32	50	120	170	3	1.28
3063E-C	●	63	32	50	120	170	4	1.64

Body(Short Type)

WEX 3050ES	●	50	32	25	110	135	5	0.86
3050ES-42	●	50	42	25	110	135	5	1.36
3063ES	●	63	32	25	110	135	6	1.02
3063ES-42	●	63	42	25	110	135	6	1.52

Inserts are not included.

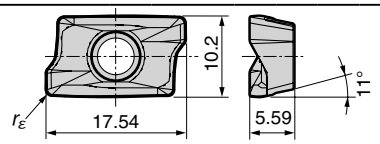
Body(Short, Coarse Pitch Type)

WEX 3050ES-C	●	50	32	25	110	135	3	0.91
3050ES-C-42	●	50	42	25	110	135	3	1.41
3063ES-C	●	63	32	25	110	135	4	1.07
3063ES-C-42	●	63	42	25	110	135	4	1.57

Inserts are not included.

Inserts (Common)

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



Grade		Coated Carbide							Carbide	DLC	
Application	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	Dimensions rε
AXMT 170508PEER-L		●	●	●	●	●			—	—	0.8
AXMT 170504PEER-G		●	●	●	●	●			—	—	0.4
170508PEER-G		●	●	●	●	●			—	—	0.8
170512PEER-G		●	●	●	●	●			—	—	1.2
170516PEER-G		●	●	●	●	●			—	—	1.6
170520PEER-G *		●	●	●	●	●			—	—	2.0
170530PEER-G *		●	●	●	●	●			—	—	3.0
AXMT 170508PEER-H		●	●	●	●	●			—	—	0.8
170512PEER-H		●	●	●	●	●			—	—	1.2
AXMT 170504PEER-E							●	●	—	—	0.4
170508PEER-E				▲			●	●	—	—	0.8
170512PEER-E							●	●	—	—	1.2
170516PEER-E							●	●	—	—	1.6
170520PEER-E *							●	●	—	—	2.0
170530PEER-E *							●	●	—	—	3.0
AXMT 170508PEER-EH				▲			●	●	—	—	0.8
AXET 170502PEFR-S		—	—	—	—	—	—	—	●	●	0.2
170504PEFR-S		—	—	—	—	—	—	—	●	●	0.4
170508PEFR-S		—	—	—	—	—	—	—	●	●	0.8

* Cutter body modification is required.

Spare Parts

Screw		Spanner	Anti-seizure Cream
			
BFTX0409IP	3.0	TRDR15IP	SUMI-P

N·m Recommended Tightening Torque (N · m)

*Cutter body modification is required when attaching an R3.0 insert with a 2.0 nose radii.

Rework this edge.
Reworking guideines
For 2.0 nose radii: C1
(AXMT170520PEER)
For 3.0 nose radii: C1.5
(AXMT170530PEER)

Standard: C0.5.

RecommendedCutting Conditions H87

WRX Type

High Efficiency Shoulder Milling of Deep Steps

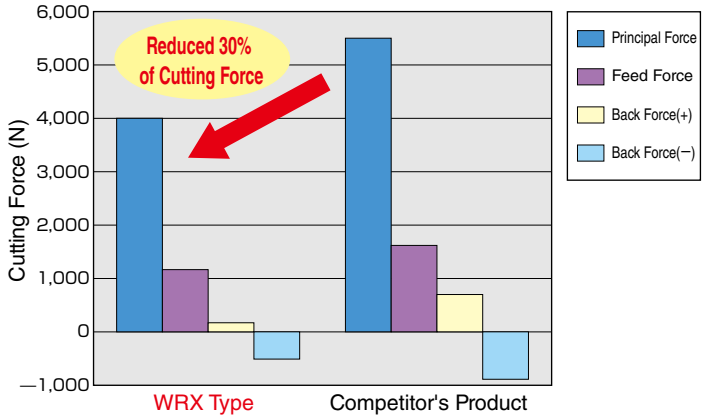
■ General Features

The SEC-WaveRepeater WRX type is an endmill that features cutting edges arranged in a wave-like configuration. Its long cutting edges are arranged in multiple stages to enable high efficiency shoulder milling of deep steps.

■ Characteristics

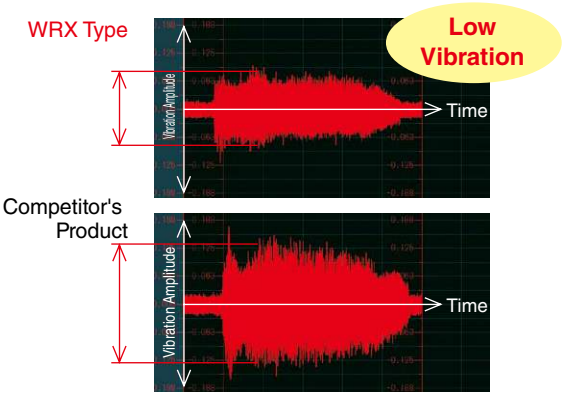
● Cutting edge positions are optimised to provide low cutting resistance and low vibration.

■ Cutting Force Comparison



(Cutting Conditions)
Work Material: S50C
Tool: WRX2025E2725
Cutting Speed: v_c=100m/min f_z=0.15mm/t a_e=10mm a_p=25mm Dry

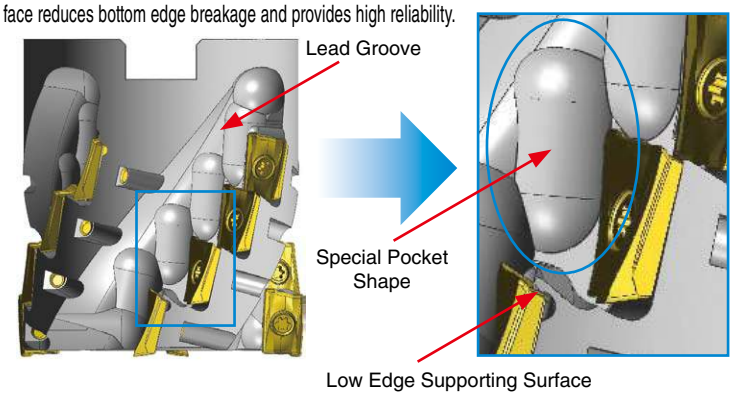
■ Vibration Comparison



(Cutting Conditions)
Work Material: S50C
Tool: WRX3080RS5332
Cutting Speed: v_c=150m/min f_z=0.20mm/t a_e=5mm a_p=40mm Dry

● Lead groove and special pocket shape provide smooth chip evacuation and high body rigidity.

● Low edge supporting face reduces bottom edge breakage and provides high reliability.

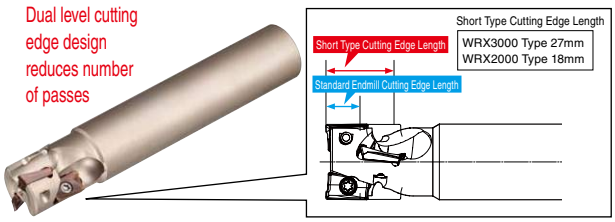


■ Product Range

Cutting Edge	Series Code	Cutting Edge Length (mm)	Cutter Diameter (mm)	Shape	Applicable Insert (*)
Standard Type	WRX2000E	27to36	ø20toø40	Shank Type	AXMT1235 Type
	WRX2000R	36	ø40toø50	Mounting Hole Type	
	WRX3000E	40to53	ø40toø50	Shank Type	AXMT1705 Type
	WRX3000R	53	ø50toø100	Mounting Hole Type	
Short Cutting Edge Type	WRX2000E	18	ø20toø40	Shank Type	AXMT1235 Type
	WRX2000R		ø40toø50	Mounting Hole Type	
	WRX3000E	27	ø40toø50	Shank Type	AXMT1705 Type
	WRX3000R		ø50toø100	Mounting Hole Type	

Short Cutting Head Series

Dual level cutting edge design reduces number of passes



* Applicable inserts are the same as those for the popular SEC-WaveMill WEX type.

■ Application Examples

WRX2000 Type

Tool: WRX2040E3642 Insert: AXMT123504PEER-G

Cutting Conditions: Depth of Cut 30mm, Cutting Width 8mm

ISO Classification	Work Material	Work Hardness (HB)	Chipbreaker	Grades																									
				ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
				Per Edge Feed Rate f_z (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
				v_c Cutting Speed (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 SUS403 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	Al Alloy Si<12.6%		S																						1000	750	500		
	Si>12.6%		S																						250	200	170		

● The recommended cutting conditions may not be practical under certain operating conditions (i.e., machine, work 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, cutting depth, and other factors.

WRX3000 Type

Tool: WRX3050E5342 Insert: AXMT170508PEER-G

Cutting Conditions: Depth of Cut 50mm, Cutting Width 10mm

ISO Classification	Work Material	Work Hardness (HB)	Chipbreaker	Grades																									
				ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
				Per Edge Feed Rate f_z (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
				v_c Cutting Speed (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 SUS403 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	Al Alloy Si<12.6%		S																						1000	750	500		
	Si>12.6%		S																						250	200	170		

● The recommended cutting conditions may not be practical under certain operating conditions (i.e., machine, work 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, cutting depth, and other factors.

WRX 2000R Type

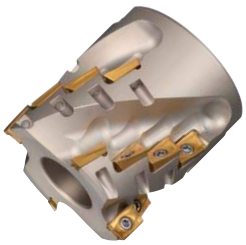
Rake Angle		
	Radial	16° to 17°
	Axial	24°

18 to 36mm 90°

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal ◎ | N Aluminum ◎ | S Exotic Alloy ◎ | H Hardened Steel

High Efficiency Machining for Steel, Stainless Steel, Cast Iron, Exotic Alloy , and Non-Ferrous Metal

Fig1



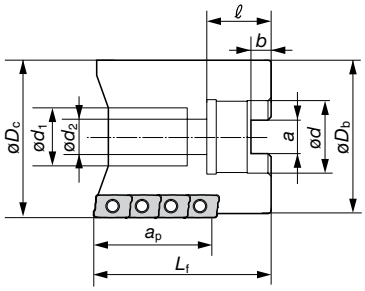
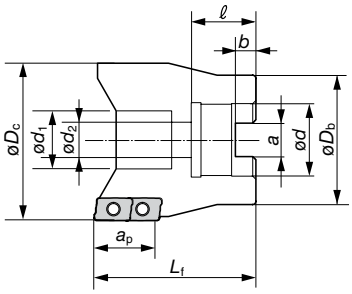


Fig2



Body (Standard Type) Metric

Cat. No.	Stock	Dimensions (mm)										Total Teeth	Steps	Effective Teeth	Weight (kg)	Fig
		øDc	ap	øDb	Lf	ød	a	b	ℓ	ød1	ød2					
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 Head) Metric

Cat. No.	Stock	Dimensions (mm)										Total Teeth	Steps	Effective Teeth	Weight (kg)	Fig
		øDc	ap	øDb	Lf	ød	a	b	ℓ	ød1	ød2					
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 not included.

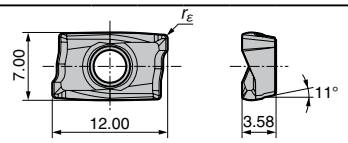
Identification Details

WRX 2 040 R S 36 16

- WRX 2: Insert Size (Insert Length 12mm)
- 040: Tool Diameter(mm)
- R: Direction
- S: Metric Bore
- 36: Cutting Edge Length (mm)
- 16: Mounting Diameter (mm)

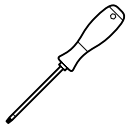
Inserts

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



Grade		Coated Carbide							Carbide	DLC	
Application	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 (New)	ACM300 (New)	H1	DL1000	Dimensions rε
AXMT 123504PEER-G		●	●	●	●	●			—	—	0.4
123508PEER-G		●	●	●	●	●			—	—	0.8
123512PEER-G		●	●	●	●	●			—	—	1.2
AXMT 123504PEER-H		●	●	●	●	●			—	—	0.4
123508PEER-H		●	●	●	●	●			—	—	0.8
123512PEER-H		●	●	●	●	●			—	—	1.2
AXMT 123504PEER-E							●	●	—	—	0.4
123508PEER-E				▲			●	●	—	—	0.8
123512PEER-E							●	●	—	—	1.2
AXMT 123508PEER-EH				▲			●	●	—	—	0.8
AXET 123502PEFR-S		—	—	—	—	—	—	—	●	●	0.2
123504PEFR-S		—	—	—	—	—	—	—	●	●	0.4
123508PEFR-S		—	—	—	—	—	—	—	●	●	0.8

Spare Parts

Spanner	Screw
	
BFTX0306IP	2.0 (N·m)	TRDR08IP

N·m Recommended Tightening Torque (N·m)

* Use peripheral inserts with nose radii of 0.8 mm or below from the second step and above.

RecommendedCutting Conditions H93

● mark : Standard stocked item (expanded item) ▲ mark : To be replaced by new item (Please confirm stock availability)

WRX 3000R Type

Rake Angle		
	Radial	13° to 15°
	Axial	22° to 24°

27 to 53mm 90°

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

High Efficiency Machining for Steel, Stainless Steel, Cast Iron, Exotic Alloy , and Non-Ferrous Metal

Fig1

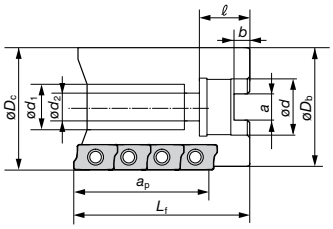


Fig2

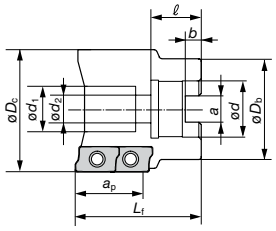
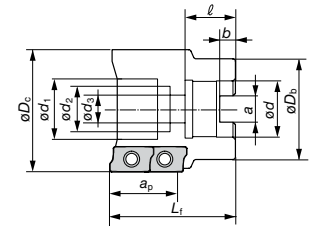


Fig3



Body (Standard Type) Metric

Cat. No.	Stock	Dimensions (mm)											Total Teeth	Steps	Effective Teeth	Weight (kg)	Fig
		ϕD_c	a_p	ϕD_b	L_f	ϕd	a	b	ℓ	ϕd_1	ϕd_2	ϕd_3					
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 Head) Metric

Cat. No.	Stock	Dimensions (mm)											Total Teeth	Steps	Effective Teeth	Weight (kg)	Fig
		ϕD_c	a_p	ϕD_b	L_f	ϕd	a	b	ℓ	ϕd_1	ϕd_2	ϕd_3					
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 Head) Imperial

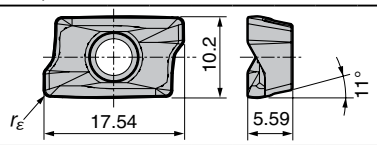
Cat. No.	Stock	Dimensions (mm)											Total Teeth	Steps	Effective Teeth	Weight (kg)	Fig
		ϕD_c	a_p	ϕD_b	L_f	ϕd	a	b	ℓ	ϕd_1	ϕd_2	ϕd_3					
WRX 3080R27254	●	*80	27	60	50	**25.4**	9.5	6	25	35	26	13	12	2	6	1.1	3
3100R27317	●	*100	27	70	63	**31.8**	12.7	8	32.5	46	28	17	14	2	7	2.0	3

Inserts are not included.Check the collet attachment size (ϕd) when selecting the cutter.

*Please use JIS B1176 hexagonal bolt (ø80: M12x30 to 35mm, ø100: M16x40 to 45mm) for securing ø80/ø100 cutter to the arbour.

Inserts (Common)

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

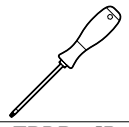


Grade		Coated Carbide							Carbide	DLC
Application	High Speed/Light	P			K		M S		K N	N
	General Purpose		P M	P M	K		M S	M S		N
	Roughing		P M	P M		K		M S		

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200 (New)	ACM300 (New)	H1	DL1000	Dimensions r_ε
AXMT 170508PEER-L	●	●	●	●	●			—	—	0.8
AXMT 170504PEER-G	●	●	●	●	●			—	—	0.4
170508PEER-G	●	●	●	●	●			—	—	0.8
170512PEER-G	●	●	●	●	●			—	—	1.2
170516PEER-G	●	●	●	●	●			—	—	1.6
170520PEER-G *	●	●	●	●	●			—	—	2.0
170530PEER-G *	●	●	●	●	●			—	—	3.0
AXMT 170508PEER-H	●	●	●	●	●			—	—	0.8
170512PEER-H	●	●	●	●	●			—	—	1.2
AXMT 170504PEER-E						●	●	—	—	0.4
170508PEER-E			▲			●	●	—	—	0.8
170512PEER-E						●	●	—	—	1.2
170516PEER-E						●	●	—	—	1.6
170520PEER-E *						●	●	—	—	2.0
170530PEER-E *						●	●	—	—	3.0
AXMT 170508PEER-EH			▲			●	●	—	—	0.8
AXET 170502PEFR-S	—	—	—	—	—	—	—	●	●	0.2
170504PEFR-S	—	—	—	—	—	—	—	●	●	0.4
170508PEFR-S	—	—	—	—	—	—	—	●	●	0.8

* Cutter body modification is required.

Spare Parts

Spanner		Screw
	N·m	
BFTX0409IP	3.0	TRDR15IP

* Use peripheral inserts with nose radii of 0.8 mm or below from the second step and above.

N·m Recommended Tightening Torque (N·m)

*Cutter body modification is required when attaching an R3.0 insert with a 2.0 nose radii.

Rework this edge.
Reworking guideines
For 2.0 nose radii: C1
(AXMT170520PEER)
For 3.0 nose radii: C1.5
(AXMT170530PEER)
Standard: C0.5.

RecommendedCutting Conditions H93

● mark : Standard stocked item (expanded item) ▲ mark : To be replaced by new item (Please confirm stock availability)

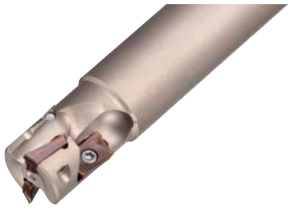
WRX 2000E Type

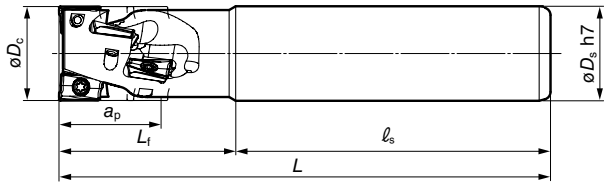
Rake Angle		
	Radial	13° to 16°
	Axial	16° to 24°

18 to 36mm 90°

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

High Efficiency Machining for Steel, Stainless Steel, Cast Iron, Exotic Alloy , and Non-Ferrous Metal





Body (Standard Type)

Cat. No.	Stock	Dimensions (mm) øDc	ap	øDs	Lf	ℓs	L	Total Teeth	Steps	Effective Teeth	Weight (kg)
WRX 2020E3620	●	20	36	20	45	85	130	4	4	1	0.3
2025E2725	●	25	27	25	45	85	130	6	3	2	0.4
2032E2732	●	32	27	32	45	85	130	9	3	3	0.7
2040E3642	●	40	36	42	45	85	130	16	4	4	1.2

Body (Body (Short Cutting Head)

WRX 2020E1820	●	20	18	20	40	80	120	4	2	2	0.3
2025E1825	●	25	18	25	45	85	130	6	2	3	0.4
2032E1832	●	32	18	32	50	90	140	8	2	4	0.8
2040E1832	●	40	18	32	40	120	160	10	2	5	1.1

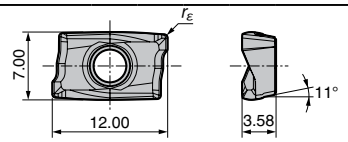
Identification Details

WRX 2 020 E 36 20

- WRX 2: Insert Size (Insert Length 12mm)
- 020: Tool Diameter (mm)
- E: Endmill
- 36: Cutting Edge Length (mm)
- 20: Shank Diameter (mm)

Inserts

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



Grade		Coated Carbide							Carbide	DLC	
Application	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 New	ACM300 New	H1	DL1000	Dimensions rε
AXMT 123504PEER-G		●	●	●	●	●			—	—	0.4
123508PEER-G		●	●	●	●	●			—	—	0.8
123512PEER-G		●	●	●	●	●			—	—	1.2
AXMT 123504PEER-H		●	●	●	●	●			—	—	0.4
123508PEER-H		●	●	●	●	●			—	—	0.8
123512PEER-H		●	●	●	●	●			—	—	1.2
AXMT 123504PEER-E							●	●	—	—	0.4
123508PEER-E				▲			●	●	—	—	0.8
123512PEER-E							●	●	—	—	1.2
AXMT 123508PEER-EH				▲			●	●	—	—	0.8
AXET 123502PEFR-S		—	—	—	—	—	—	—	●	●	0.2
123504PEFR-S		—	—	—	—	—	—	—	●	●	0.4
123508PEFR-S		—	—	—	—	—	—	—	●	●	0.8

-G: General purpose, H: Strong edge, S: For aluminium alloy

Spare Parts

Spanner	Screw	N·m
		
TRDR08IP	BFTX0306IP	2.0

N·m Recommended Tightening Torque (N·m)

* Use peripheral inserts with nose radii of 0.8 mm or below from the second step and above.

RecommendedCutting Conditions H93

● mark : Standard stocked item (expanded item) ▲ mark : To be replaced by new item (Please confirm stock availability)

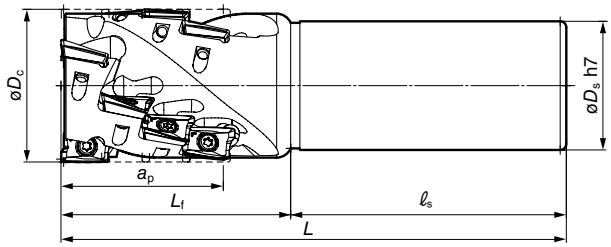
WRX 3000E Type

Rake Angle		
	Radial	12° to 13°
	Axial	20° to 22°

27 to 53mm 90°

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

High Efficiency Machining for Steel, Stainless Steel, Cast Iron, Exotic Alloy , and Non-Ferrous Metal



Body (Standard Type)

Cat. No.	Stock	Dimensions (mm) øDc	ap	øDs	Lf	ℓs	L	Total Teeth	Steps	Effective Teeth	Weight (kg)
WRX 3040E4042	●	40	40	42	65	85	150	9	3	3	1.3
3050E5342	●	50	53	42	75	90	165	12	4	3	1.8

Body (Short Cutting Head)

WRX 3040E2732	●	40	27	32	60	120	180	6	2	3	1.2
3050E2732	●	50	27	32	60	120	180	8	2	4	1.4

Milling Cutter Body Inserts are not included.

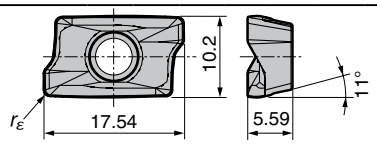
Identification Details

WRX 3 040 E 40 42

- WRX 3: Insert Size (Insert Length 17mm)
- 040: Tool Diameter (mm)
- E: Endmill
- 40: Cutting Edge Length (mm)
- 42: Shank Diameter (mm)

Inserts (Common)

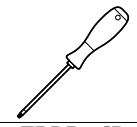
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel



Grade		Coated Carbide							Carbide	DLC	
Application	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	New ACM200	New ACM300	H1	DL1000	Dimensions rε
AXMT 170508PEER-L		●	●	●	●	●			—	—	0.8
AXMT 170504PEER-G		●	●	●	●	●			—	—	0.4
170508PEER-G		●	●	●	●	●			—	—	0.8
170512PEER-G		●	●	●	●	●			—	—	1.2
170516PEER-G		●	●	●	●	●			—	—	1.6
170520PEER-G *		●	●	●	●	●			—	—	2.0
170530PEER-G *		●	●	●	●	●			—	—	3.0
AXMT 170508PEER-H		●	●	●	●	●			—	—	0.8
170512PEER-H		●	●	●	●	●			—	—	1.2
AXMT 170504PEER-E							●	●	—	—	0.4
170508PEER-E				▲			●	●	—	—	0.8
170512PEER-E							●	●	—	—	1.2
170516PEER-E							●	●	—	—	1.6
170520PEER-E *							●	●	—	—	2.0
170530PEER-E *							●	●	—	—	3.0
AXMT 170508PEER-EH				▲			●	●	—	—	0.8
AXET 170502PEFR-S		—	—	—	—	—	—	—	●	●	0.2
170504PEFR-S		—	—	—	—	—	—	—	●	●	0.4
170508PEFR-S		—	—	—	—	—	—	—	●	●	0.8

*Cutter body modification is required.

Spare Parts

Spanner		Screw
	N·m	
BFTX0409IP	3.0	TRDR15IP

* Use peripheral inserts with nose radii of 0.8 mm or below from the second step and above.

N·m Recommended Tightening Torque (N·m)

*Cutter body modification is required when attaching an R3.0 insert with a 2.0 nose radii.

Rework this edge.
Reworking guideines
For 2.0 nose radii: C1
(AXMT170520PEER)
For 3.0 nose radii: C1.5
(AXMT170530PEER)
Standard: C0.5.

RecommendedCutting Conditions H93

● mark : Standard stocked item (expanded item) ▲ mark : To be replaced by new item (Please confirm stock availability)

CHG 4000Type

Rake Angle		
	Radial	+4°
	Axial	+15°

16mm 90°

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

Shoulder Milling for Steel, Stainless Steel, Non-Ferrous & Cast Iron

Fig 1

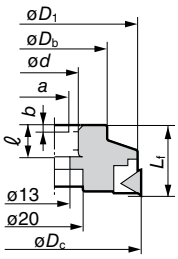


Fig 2

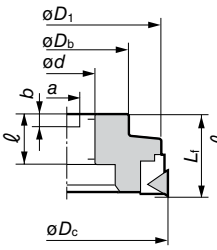


Fig 3

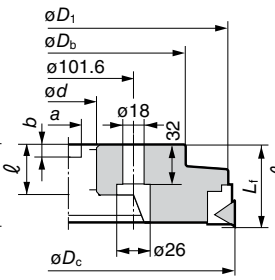
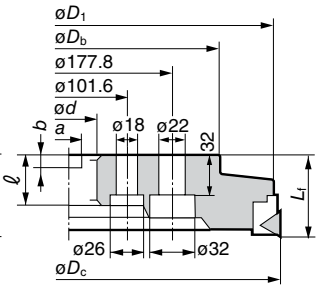


Fig 4



Body Imperial

Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
CHG 4080R	●	*80	78	60	50	**25.4**	9.5	6	25	4	1.3	1
4100R	●	**100**	96	70	63	**31.75**	12.5	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
CHG 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 not included.

*Please use hexagonal bolt (JISB1176) M12 x 30-35 mm for securing φ80 mm Cutter to the arbour.

Inserts

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

Grade		Coated Carbide							Carbide			Cermet	SUMIDIA			
Application	High Speed/Light	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 *										●	●		●	—	▲	5-A
NF-TEEN 43R		—	—	—	—	—	—		—	—	—	—	—	●	▲	5-A
TEEN 43TR		●	●	●					●			●	—	—	—	6(5)-B
TEKN 43R					●	●	●			●			—	—	—	6(5)-A
43TR		●	●	●					●			●	—	—	—	6(5)-B

Fig 5

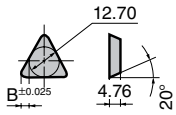
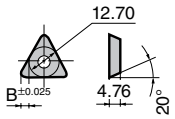


Fig 6 ACP/ACK Series Grades



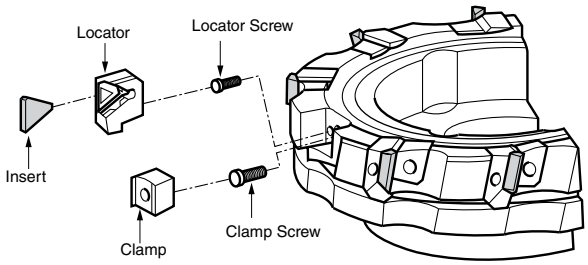
Type A

Type B

*TEEN43R can be made-to-order in grade DL1000.

· Upper side and wiper edge of H1 have mirrored finish.

· Some E class precision inserts have different shapes.



Spare Parts

Applicable Cutters	Locator	Clamp	Clamp Screw	Locator Screw	Spanners
CHG 4080R to CHG 4125R	LCH4R	CHWR	FBX0811	FBH0512	TH030 TH040
CHG 4160R to CHG 4315R			FBX0817		

* TH030: for locator screw TH040: for clamp screw

Clamp Screw	Size	N·m
	M8	8.0

Locator Screw	Size	N·m
	M5	5.0

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	General Steel	180 to 280HB	80-**115**-150	0.10-**0.18**-0.25	ACP200
P	Soft 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	—	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	—	300-**650**-1000	0.10-**0.20**-0.30	DA1000 H1

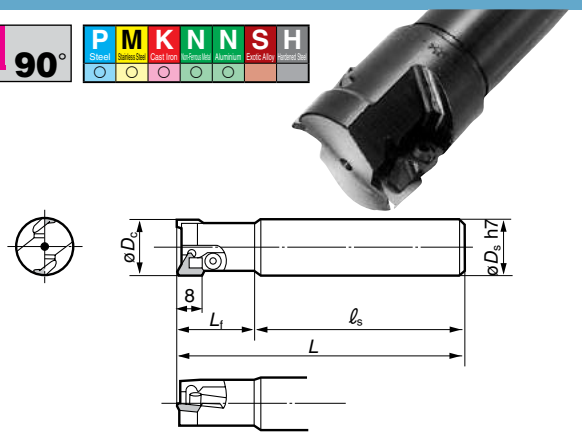
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

▲ mark : To be replaced by new item (Please confirm stock availability)

SEC-Multi Use Endmills

CHE 2000Type

8mm 90° | P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel



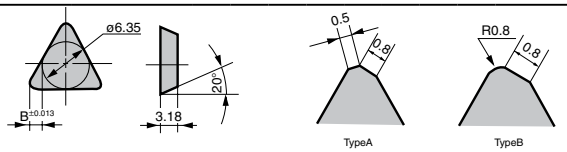
Body

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Axial Rake	Radial Rake
CHE 2016R	●	**16**	16	25	75	100	1	+6°	–3°
2018R	●	**18**	20	30	80	110	1	+8°	–2°
CHE 2020R	●	**20**	20	30	80	110	2	+10°	–2°
2022R	●	**22**	20	30	80	110	2	+12°	–1°
2025R	●	**25**	25	35	85	120	2	+15°	–1°
2028R	●	**28**	25	35	85	120	2	+15°	0°

Inserts are not included.

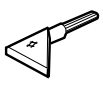
Inserts

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



Grade		Coated Carbide		Carbide			Cermet	SUMIDIA	
Application	High Speed/Light					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
NF-TEEN 22R		—		—	—	—	—	●	▲	A
TECN 22R					●	●		—	—	A
22TR				●				—	—	B
TEKN 22R					●			—	—	A
22TR				●			●	—	—	B

Spare Parts

Clamp	Screw		Ring	Spanner
		N·m		
CCH4R	BHE0407	1.8	ER03	TH025

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

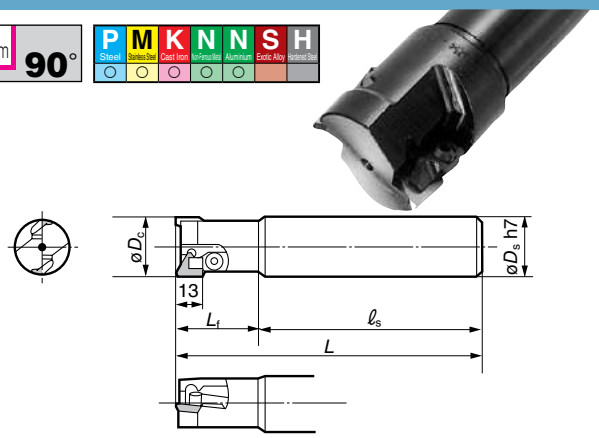
ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	Low Carbon Steel	180 to 280HB	50- **75** -100	0.03-**0.06**-0.10	A30N
	Alloy Steel	180 to 280HB	50- **75** -80	0.03-**0.05**-0.06	A30N
K	Cast Iron	250HB	40- **70** -100	0.03-**0.10**-0.15	G10E
N	Non-ferrous Metal	—	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, cutting depth, and other factors.

SEC-Multi Use Endmills

CHE 3000Type

13mm 90° | P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel



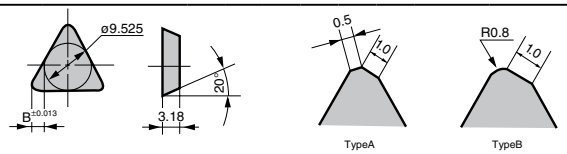
Body

Cat. No.	Stock	Dimensions (mm) øDc	øDs	Lf	ℓs	L	No. of Teeth	Axial Rake	Radial Rake
CHE 3030R	●	**30**	32	45	115	160	2	+15°	–3°
3032R	●	**32**	32	45	115	160	2	+15°	–2°
3036R	●	**36**	32	45	115	160	2	+15°	–1°
3040R	●	**40**	32	45	115	160	2	+15°	0°

Inserts are not included.

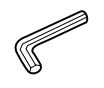
Inserts

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



Grade		Coated Carbide		Carbide			Cermet	SUMIDIA	
Application	High Speed/Light		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
NF-TEEN 32R		—	—	—	—	—	—	●	▲	A
TECN 32R					●	●		—	—	A
32TR				●				—	—	B
TEKN 32R			●		●			—	—	A
32TR		●		●			●	—	—	B

Spare Parts

Clamp	Screw		Ring	Spanner
		N·m		
CCH5R	BHE0510	2.7	ER04	LH030

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	Low 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
N	Non-ferrous Metal	—	60-**130**-200	0.04-**0.12**-0.20	DA1000 H1

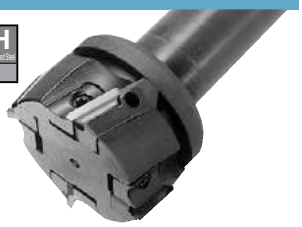
Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

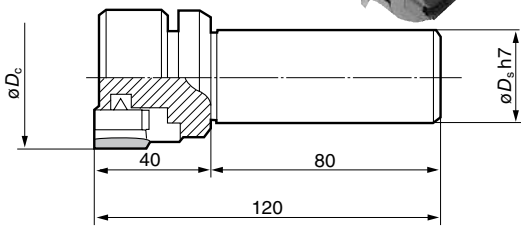
▲mark :To be replaced by new item (Please confirm stock availability)

CHE 4000 Type

16mm 90°

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





Body

Cat. No.	Stock	Dimensions (mm) øDc	Dimensions (mm) øDs	No. of Teeth	Axial Rake	Radial Rake	Approach Angle
CHE 4050R	●	**50**	32	3	+15°	+2°	0°
CHE 4063R	●	**63**	32	4	+15°	+3°	0°
4080R	●	**80**	32	4	+15°	+4°	0°
4080RS42		**80**	42	4	+15°	+4°	0°
CHE 4100R		**100**	32	5	+15°	+4°	0°
4100RS42		**100**	42	5	+15°	+4°	0°

Inserts are not included.

Inserts

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

Fig 1

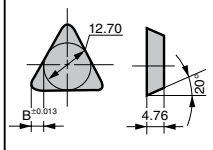
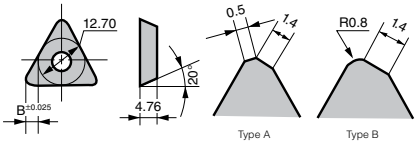


Fig 2
(For ACP/ACK Series Grades)



Grade		Coated Carbide					Carbide		Cermet	SUMIDIA	
Application	High Speed/Light	P			K					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	A30N	G10E	T250A	DA1000	DA2200	Fig
NF-TEEN 43R		—	—	—	—	—	—	—	—	●	▲	1-A
TEEN 43R								●		—	▲	1-A
43TR		●	●	●			●		●	—	—	2(1)-B
TEKN 43R					●	●		●		—	—	2(1)-A
43TR		●	●	●			●		●	—	—	2(1)-B

H1, DA150, and DL1000 grades are also available for TEEN43R

Spare Parts

Locator	Clamp	Clamp Screw	Size	N·m	Locator Screw	Size	N·m	Spanner	Applicable Endmills
									CHE4050R CHE4063R
LCE4R	CEWR	WB8R-16T	**M8**	8.0	FBH0512	**M5**	5.0	TT27	
									CHE4080R CHE4100R CHE4080RS42 CHE4100RS42
LCH4R	CHWR	FBX0811	**M5**	5.0	FBH0512	**M5**	5.0	TH040	

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	Low 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 Metal	—	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, cutting depth, and other factors.

▲ mark : To be replaced by new item (Please confirm stock availability)

CPG 4000 Type

Rake Angle		
	Radial	0°
	Axial	+6°

18mm 90°

P (Steel) ○ M (Stainless Steel) ○ K (Cast Iron) ○ N (Non-Ferrous Metal) N (Aluminum) S (Exotic Alloy) H (Hardened Steel)

Shoulder Milling for Steel, Stainless Steel & Cast Iron

Fig 1

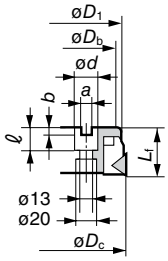


Fig 2

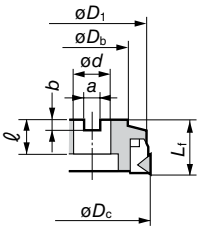
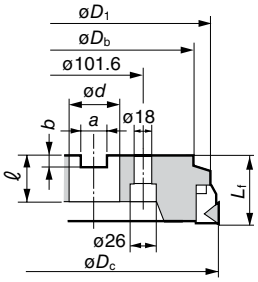


Fig 3



Body Imperial

Cat. No. (R)	Stock	Cat. No. (L)	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	No. of Teeth	Weight (kg)	Fig
CPG 4080R	●	**CPG 4080L**		*80	77	60	50	**25.4**	9.5	6	25	5	1.2	1
4100R	●	**4100L**		**100**	98	75	60	**31.75**	12.7	8	32	6	2.0	2
4125R	●	**4125L**		**125**	121	75	60	**38.1**	15.9	10	38	8	3.3	2
4160R	●	**4160L**		**160**	155	100	60	**50.8**	19.1	11	38	10	5.5	2
4200R	●	**4200L**		**200**	194	130	60	**47.625**	25.4	13.5	38	12	8.6	3
CPG 4250R		**CPG 4250L**		**250**	243	200	70	**47.625**	25.4	13.5	52	14	17.9	3
4315R		**4315L**		**315**	308	240	70	**47.625**	25.4	13.5	52	18	25.5	3

Inserts are not included.

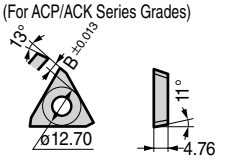
*Please use hexagonal bolt (JISB1176) M12 x 30-35 mm for securing φ80 mm Cutter to the arbour.

Inserts

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

Grade		Coated Carbide						Carbide				Cermet				
Application	High Speed/Light	P			K		M					P	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	T1200A	T130A	T250A	Fig
TPCH 43R					●	●	●				●					4(5)
43L											●					5
43TR		●	●	●					●	●		●	▲		●	4(5)
43TL									●							5
TPMN 432								●			●		▲	●		6
433								●			●					6

Fig 4 (For ACP/ACK Series Grades)



(Close-up of Edge for Fig. 4 & 5)

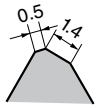


Fig 5

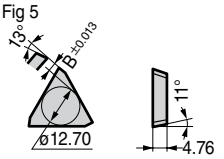
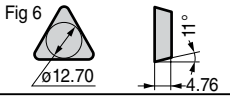
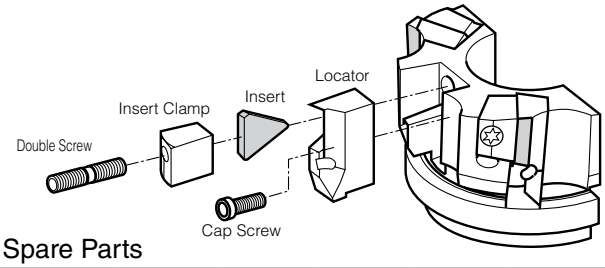


Fig 6





Spare Parts

Applicable Cutters	Locator	Insert Clamp	Double Screw	Cap Screw	Spanner
CPG4080R	LCP40R	PTW40R	WB8-22T	BX0508	TT27 LH040
CPG4100R to CPG4125R	LCP40R	PTW41R	WB8-22T	BX0510	TT27 LH040
CPG4160R to CPG4500R	LCP40R	PTW41R	WB8-30T	BX0510	TT27 LH040
CPG4080L	LCP40L	PTW40L	WB8-22T	BX0508	TT27 LH040
CPG4100L to CPG4125L	LCP40L	PTW41L	WB8-22T	BX0510	TT27 LH040
CPG4160L to CPG4500L	LCP40L	PTW41L	WB8-30T	BX0510	TT27 LH040

TT27-Double Screw Spanner, LH040-Cap Screw Spanner

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	General Steel	180 to 280HB	80-**110**-140	0.10-**0.18**-0.25	ACP200
P	Soft 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, cutting depth, and other factors.

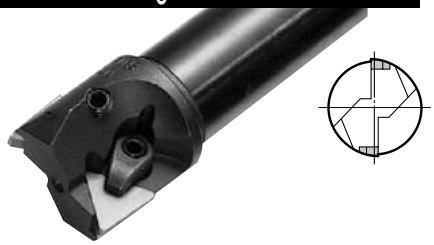
▲ mark : To be replaced by new item (Please confirm stock availability)

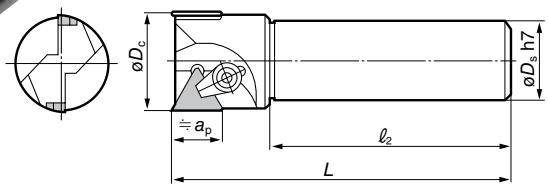
FMS Type

8 to 19mm 90°

P Steel | M Stainless Steel | K Cast Iron | N Non-ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

Shoulder Milling for Steel & Cast Iron





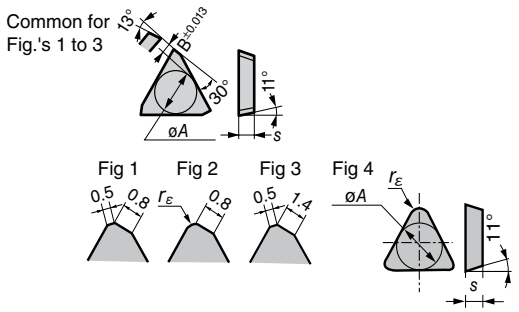
Body

Cat. No.	Stock	Dimensions (mm) øDc	L	øDs	ap	ℓ2	No. of Teeth	Axial Rake	Radial Rake	Applicable Insert
FMS 216	●	**16**	70	16	8	50	1	+3°	– 6°	TPKN 22TR
220	●	**20**	100	20	8	75	2	+3°	– 4°	
225	●	**25**	110	25	8	80	2	+7°	– 4°	
FMS 330	●	**30**	160	32	13	120	2	+7°	– 4°	TPKN 32TR
332	●	**32**	160	32	13	120	2	+7°	– 4°	
335	●	**35**	160	32	13	120	2	+7°	– 4°	
FMS 440	●	**40**	160	32	19	120	2	+7°	– 4°	TPCH 43TR
450	●	**50**	160	32	19	120	2	+7°	– 4°	
460	●	**60**	160	32	19	120	3	+7°	– 4°	
440B		**40**	160	42	19	120	2	+7°	– 4°	

Inserts are not included.

Inserts

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



Grade		Coated Carbide					Carbide			Cermet			Dimensions (mm)		rε	Fig	Applicable Endmill
Application		ACP100	ACP200	ACP300	ACK200	ACK300	A30N	A30	G10E	T1500A	T1200A	T250A	A	s			
High Speed/Light		P			K					P	P						
General Purpose			P M	P M	K		P		K			P					
Roughing			P M	P M		K											
TPKN 22TR							●					●	6.35	3.18	0.8	2	FMS 200
22R								●					6.35	3.18	—	1	
TPMN 222								●	●				6.35	3.18	0.8	4	
TPKN 32TR							●					●	9.525	3.18	0.8	2	FMS 300
32R								●					9.525	3.18	—	1	
TPMN 322								●	●	●	▲		9.525	3.18	0.8	4	
TPCH 43TR		●	●	●			●			●	▲	●	12.70	4.76	—	3	FMS 400
43R					●	●			●				12.70	4.76	—	3	
TPMN 432								●	●	●	▲		12.70	4.76	0.8	4	
433								●	●				12.70	4.76	1.2	4	

H10E grade is also avaliable for TPCH43TR.
EH10Z and EH20Z grades are also available for TPCH43R.

Recommended Cutting Conditions

Diameter ø16 to ø25 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	Low 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
N	Non-ferrous Metal	—	40- **90** -150	0.03- **0.10** -0.15	G10E

Diameter ø30 to ø35 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	Low 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
N	Non-ferrous Metal	—	60- **130** -200	0.04- **0.12** -0.20	G10E

Diameter ø40 to ø60 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	Low 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
N	Non-ferrous Metal	—	80- **140** -200	0.05- **0.15** -0.25	G10E

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

Spare Parts

Clamp	Double Screw			Shim	Spring Pin	Spanner	Applicable Endmill
		サイズ	(N·m)				
CCM5BSL	WB5-10 WB5-12	**M5**	5.0	—	—	TH025	FMS 200
CCM6BL	WB6-16	**M6**	5.0	—	—	LH030	FMS 300
CCM8UL	WB8-20	**M8**	8.0	STPL42	SPP308	LH040	FMS 400

(N·m) Recommended Tightening Torque (N·m)

▲ mark : To be replaced by new item (Please confirm stock availability)

WBMR Type

General Features

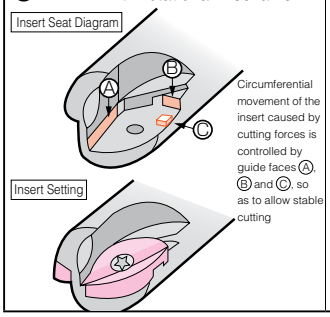
Indexable ballnose endmill series for 3-dimensional roughing to finish copy milling of die molds and machine parts.
Roughing series WBMR type is avaliable from ø20 to 50mm.
Finishing series WBMF type is avaliable from ø10 to 30mm.

3-D Rough Copy Milling

WBMR2000 Type / 2000L Type (ø20 to 50mm)

- Wave-shaped, high rake insert design that promotes a sharp cutting edge and low cutting force.
- Economical M-class insert with strong cutting edge.
- Stopper guides prevent insert from slipping during machining.
- Only one insert type required for large diameter cutters (ø40 and ø50), easier tool management.

● WBMR Anti-Rotational Mechanism

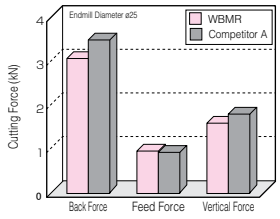


WBMR2000
(ø20 to ø50mm)

WBMR2000L
(ø20 to ø50mm)

Performance

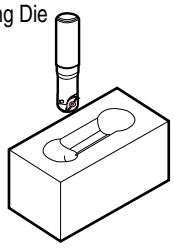
●Cutting Force



Work Material: S50C
Cutting Conditions
(Shoulder Milling, Down Cut)
v_c=200m/min
f_z=0.15mm/t
Axial Cutting Depth 5mm
Radial Cutting Depth 5mm

Application Examples

●Cold Molding Die
(SKD11)



<Evaluation>
Flank wear after continous cutting for seven hours was less than competitor's product. Stable cutting was observed.

WBMR2200S (ø20)
Grade ACZ350
Cutting Conditions
n=2200min^{-1}
v_f=500mm/min
D.O.C. 0.3 to 2mm
Non-water Soluble Cutting Oil

Spare Parts

Endmill Cat. No. ☐ indicates S/M/L type	Parts Name	Short Edge Type	Long Edge Type (-☐L)	
		Main Insert	Main Insert	Main Insert
WBMR2200☐(L)	Screw	BFTX0307N (N·m) 2.0		
	Wrench	TRX10		
WBMR2250☐(L)	Screw	BFTX0409N (N·m) 3.0		
	Wrench	TRD15		
WBMR2300☐(L)	Screw	BFTX0511N (N·m) 5.0		BFTX0407N (N·m) 3.0
	Wrench	TRD20		TRD15
WBMR2400☐(L)	Screw	BFTX0619N (N·m) 7.5		BFTX0409N (N·m) 3.0
	Wrench	TRD25		TRD15
WBMR2500☐(L) WBMR2500☐(L)-C	Screw	BFTX0619N (N·m) 7.5		BFTX0409N (N·m) 3.0
	Wrench	TRD25		TRD15

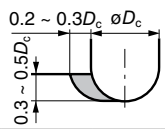
(N·m) Recommended Tightening Torque (N·m)

Anti-seizure cream SUMI-P included in the package.

Recommended Cutting Conditions

(A) Tip blade only

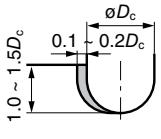
ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	Low Carbon Steel	180 to 280HB	100-**150**-200	0.10-**0.20**-0.30	ACP200
	Alloy Steel	180 to 280HB	70-**100**-120	0.10-**0.20**-0.30	ACP200
M	Stainless Steel, Die Steel	—	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, cutting depth, and other factors.

(B) Tip blade and peripheral blade

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z (mm/t) Min. - **Optimum** - Max.	Grade
P	Low Carbon Steel	180 to 280HB	80-**120**-150	0.10-**0.20**-0.30	ACP200
	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, cutting depth, and other factors.

SEC-WaveBall (Roughing Short Edge Type)

WBMR 2000 Type

Rake Angle	Radial	—
	Axial	−10°

20 to 47 mm

P Steel ◎ | M Stainless Steel ◎ | K Cast Iron ◎ | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy ○ | H Hardened Steel ○

Fig 1

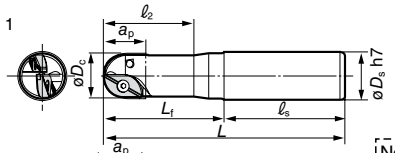
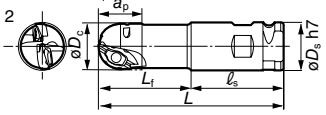


Fig 2



Note: Fig. 2 shows combination shank diagram (2500□-C).

Body

Cat. No.	Stock	Dimensions (mm)							Fig
		$\varnothing D_c$	$\varnothing D_s$	a_p	L_f	ℓ_s	ℓ_2	L	
WBMR 2200S	●	**20**	25	20	60	80	40	140	1
2200M	●	**20**	25	20	60	140	40	200	1
2200L	●	**20**	25	20	80	170	40	250	1
WBMR 2250S	●	**25**	32	23	70	80	50	150	1
2250M	●	**25**	32	23	73	147	50	220	1
2250L	●	**25**	32	23	100	200	50	300	1
WBMR 2300S	●	**30**	32	28	80	80	60	160	1
2300M	●	**30**	32	28	85	155	60	240	1
2300L	●	**30**	32	28	120	230	60	350	1
WBMR 2400S	●	**40**	42	35	100	100	—	200	1
2400M	●	**40**	42	35	180	100	—	280	1
2400L	●	**40**	42	35	250	100	—	350	1
WBMR 2500S	●	**50**	42	47	100	100	—	200	1
2500M	●	**50**	42	47	180	100	—	280	1
2500L	●	**50**	42	47	250	100	—	350	1
WBMR 2500S-C	●	**50**	50.8	47	100	100	—	200	2
2500M-C	●	**50**	50.8	47	180	100	—	280	2
2500L-C	●	**50**	50.8	47	250	100	—	350	2

Inserts are not included.

SEC-WaveBall (Roughing Long Edge Type)

WBMR 2000L Type

Rake Angle	Radial	—
	Axial	−10°

30 to 69 mm

P 鋼 ◎ | M ステン ○ | K 鋳鉄 ◎ | N 非鉄 | N アルミ | S 難削材 | H 高硬度材

Fig 3

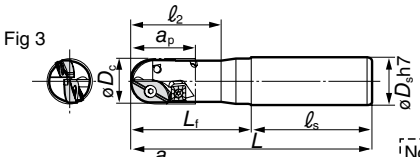
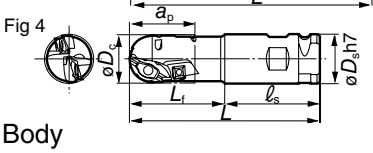


Fig 4



Note: Fig. 2 shows combination shank diagram (2500□-C).

Body

Cat. No.	Stock	Dimensions (mm)							Fig
		$\varnothing D_c$	$\varnothing D_s$	a_p	L_f	ℓ_s	ℓ_2	L	
WBMR 2200SL	●	**20**	25	30	60	80	40	140	3
2200ML	●	**20**	25	30	60	140	40	200	3
2200LL	●	**20**	25	30	80	170	40	250	3
WBMR 2250SL	●	**25**	32	38	70	80	50	150	3
2250ML	●	**25**	32	38	73	147	50	220	3
2250LL	●	**25**	32	38	100	200	50	300	3
WBMR 2300SL	●	**30**	32	42	80	80	60	160	3
2300ML	●	**30**	32	42	85	155	60	240	3
2300LL	●	**30**	32	42	120	230	60	350	3
WBMR 2400SL	●	**40**	42	50	100	100	—	200	3
2400ML	●	**40**	42	50	180	100	—	280	3
2400LL	●	**40**	42	50	250	100	—	350	3
WBMR 2500SL	●	**50**	42	69	100	100	—	200	3
2500ML	●	**50**	42	69	180	100	—	280	3
2500LL	●	**50**	42	69	250	100	—	350	3
WBMR 2500SL-C	●	**50**	50.8	69	100	100	—	200	4
2500ML-C	●	**50**	50.8	69	180	100	—	280	4
2500LL-C	●	**50**	50.8	69	250	100	—	350	4

Inserts are not included.

Inserts (Common)

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

Fig 5

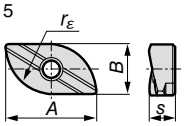


Fig 6

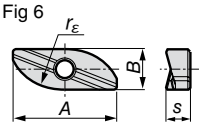


Fig 7

Fig 8

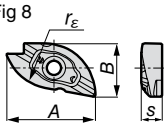
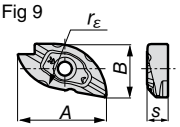


Fig 9



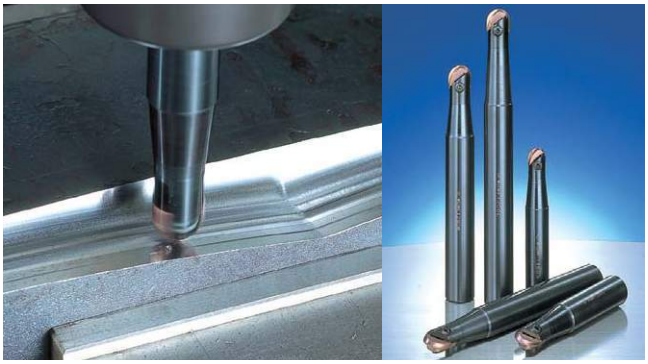
Grade		Coated Carbide				
Application	High Speed/Light	P			K	
	General Purpose		PM	PM	K	
	Roughing		PM	PM		K

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	Dimensions (mm) A	B	s	r_ε	Fig	Applicable Endmill	Remarks
ZNMT 1804100-C		●	●		●	18.00	9.76	4.76	10	5	WBMR 2200	· Main inserts are Fig. 5 & 6. · Additional insert Fig. 7 for 2200□L
2004100-S		●	●		●	20.00	7.50	4.37	10	6		
SPMT 070308		●	●		●	7.94	—	3.18	—	7		
ZNMT 2205125-C		●	●		●	22.50	12.20	5.70	12.5	5	WBMR 2250	· Main inserts are Fig. 5 & 6. · Additional insert Fig. 7 for 2250□L
2305125-S		●	●		●	23.00	9.38	5.56	12.5	6		
SPMT 09T308		●	●		●	9.53	—	3.97	—	7		
ZNMT 2706150-C		●	●		●	27.00	14.64	6.75	15	5	WBMR 2300	· Main inserts are Fig. 5 & 6. · Additional insert Fig. 7 for 2300□L
2806150-S		●	●		●	28.00	11.25	6.35	15	6		
SPMT 09T308		●	●		●	9.53	—	3.97	—	7		
ZNMT 3608200		●	●		●	36.00	19.5	8.65	20	8	WBMR 2400	· Main inserts are Fig. 8 x 2pcs. · Additional insert Fig. 7 for 2400□L
SPMT 09T308		●	●		●	9.53	—	3.97	—	7		
ZNMT 4310250		●	●		●	43.00	25.7	10.15	25	8	WBMR 2500	· Main inserts use Fig. 8 x 2pcs / Fig. 9 (nicked) x 2pcs. · Additional insert Fig. 7 for 2500□L
4310250-N		●	●		●	43.00	25.7	10.15	25	9		
SPMT 120408						12.70	—	4.76	—	7		

■ Spare Parts, ■ Recommended Cutting Conditions Listed On H103

SEC-WaveBall

WBMF Type



General Features

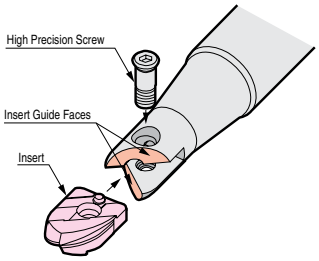
Indexable ballnose endmill series for 3-dimensional roughing to finish copy milling of die molds and machine parts. Roughing series WBMR type is avaliable from ø20 to 50mm. Finishing series WBMF type is avaliable from ø10 to 30mm.

3-D Finish Copy Milling

WBMF1000 Type (ø10 to 30mm)

- Simple but precise clamping design.
- Original large screw design.
- Sharp cutting edge that produces good finishing.
- Excellent wear resistance with Super ZX Coat.

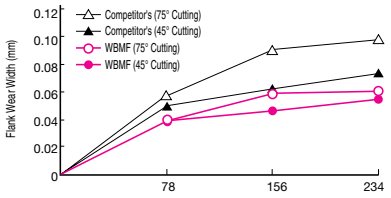
● WBMF Assembly



WBMF1000

Performance

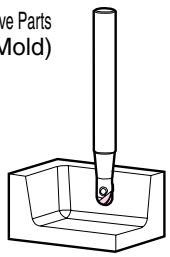
● Insert Life



<Results>
WBMF out-performs competitor's products inmost processes including plan profiling with better wear resistance.
Work Material: S50C
Process: Plan Profiling (45°, 75°)
Cutting Conditions
n=2,000min^{-1}
v_f=2,000mm/min
a_p=0.3mm
p_t=0.6mm
Dry

Application Examples

●Mold for Automotive Parts (Injection Mold)



<Evaluation>
Much better finishing as compared to competitor's, polishing time required is reduced by half.
WBMF1000 Type
Work Material: S55C
Process: Contouring
Cutting Conditions
n=2,500min^{-1}
v_f=800mm/min
a_p=0.7mm
Overhang=150mm
Wet

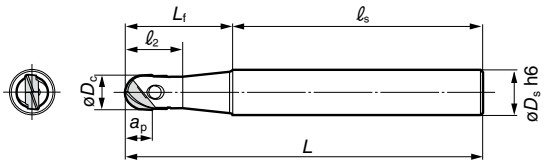
SEC-WaveBall for Finishing

WBMF 1000 Type

Rake Angle		
	Radial	–
	Axial	0°

0.1 to 0.4mm

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



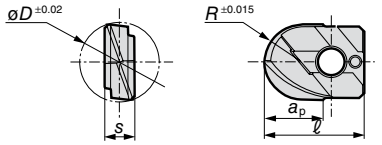
Body

Cat. No.	Stock	Dimensions (mm)						
		$øD_c$	$øD_s$	a_p	L_f	ℓ_s	ℓ_2	L
WBMF 1100S	●	**10**	16	9	30	70	17	100
1100M	●	**10**	16	9	35	95	17	130
1100L	●	**10**	16	9	50	130	17	180
WBMF 1120S	●	**12**	16	10.5	40	70	19.5	110
1120M	●	**12**	16	10.5	40	110	19.5	150
1120L	●	**12**	16	10.5	60	140	19.5	200
WBMF 1160S	●	**16**	20	12	50	80	25.5	130
1160M	●	**16**	20	12	50	130	25.5	180
1160L	●	**16**	20	12	70	150	25.5	220
WBMF 1200S	●	**20**	25	15	60	80	32	140
1200M	●	**20**	25	15	60	140	32	200
1200L	●	**20**	25	15	80	170	32	250
WBMF 1250S	●	**25**	32	18.5	70	80	36	150
1250M	●	**25**	32	18.5	73	147	36	220
1250L	●	**25**	32	18.5	100	200	36	300
WBMF 1300S	●	**30**	32	22.5	80	80	43	160
1300M	●	**30**	32	22.5	85	155	43	240
1300L	●	**30**	32	22.5	120	230	43	350

Inserts are not included.

Inserts

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



Grade		Coated Carbide
Application	High Speed/Light	P
	General Purpose	
	Roughing	

Cat. No.	ACZ120	Dimensions (mm)					Applicable Endmill
		$øD$	ℓ	a_p	a	R	
ZPGU 1551050	●	10	15.6	9	5.1	5.0	WBMF1100
1856060	●	12	18	10.5	5.6	6.0	WBMF1120
2061080	●	16	20.5	12	6.1	8.0	WBMF1160
2471100	●	20	24.5	15	7.1	10.0	WBMF1200
2876125	●	25	28.5	18.5	7.6	12.5	WBMF1250
3486150	●	30	34.4	22.5	8.6	15.0	WBMF1300

Spare Parts

Precision Screw	N·m	Spanner	Applicable Endmill
BFTG0408F	3.0	TRD15	WBMF1100
BFTG0409F	3.0	TRD15	WBMF1120
BFTG0513F	5.0	TRD20	WBMF1160
BFTG0617F	7.5	TRD25	WBMF1200
BFTG0621F	7.5	TRD25	WBMF1250
BFTG0825F	7.5	TRD25	WBMF1300

N·m Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Low 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, cutting depth, and other factors.

SEC-T Slot Endmills

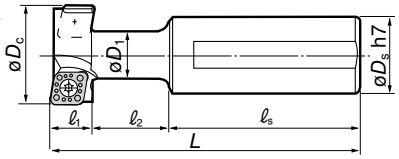
TSE Type

Rake Angle		
	Radial	0°
	Axial	0°

9 to 22mm 90°

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

T Slot Milling

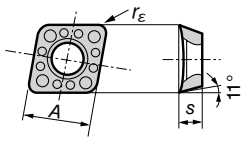


Body

Cat. No.	Stock	Dimensions (mm)							No. of Teeth
		øDc	øD1	øDs	ℓ1	ℓ2	ℓs	L	
TSE 2125	●	21	10.5	25	9	20	80	109	2
2525	●	25	12.5	25	11	21	80	112	2
3232	●	32	16.5	32	14	26	80	120	2
4032	●	40	20.5	32	18	32	80	130	2
TSE 5032	●	50	26.5	32	22	38	80	140	4

Inserts are not included.

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



Grade		Coated Carbide	Carbide	
Application	High Speed/Light			
	General Purpose	PM	PK	K
	Roughing			

Cat. No.	AC630M	A30	G10E	Dimensions (mm)			Applicable Endmill
				A	s	rε	
CPMT 060204N-US	●	●	●	6.35	2.38	0.4	TSE 2125
080308N-US	●	●	●	7.938	3.18	0.8	TSE 2525
09T308N-US	●	●	●	9.525	3.97	0.8	TSE 3232
CPMH120408N-US	●	●	●	12.7	4.76	0.8	TSE 4032,5032

Spare Parts

Screw	N·m	Spanner	Applicable Endmill
BFTX02506N	1.5	TRX08	TSE2125
BFTX0307N	2.0	TRX10	TSE2525
BFTX0407N	3.0	TRX15	TSE3232
BFN0511T	5.0	TRX20	TSE4032 TSE5032

N·m Recommended Tightening Torque (N · m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed V_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
P	Low 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, cutting depth, and other factors.

SEC-Slitting Cutter

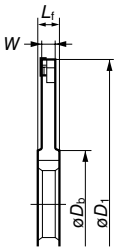
TSM Type

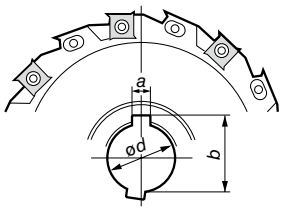
Rake Angle		
	Radial	−12°
	Axial	−2°

4 to 8mm 88°30'

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

Slotting for Steel & Cast Iron



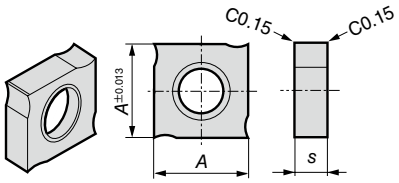


Body

Cat. No.	Dimensions (mm)							No. of Teeth	Weight (kg)
	øD1	øDb	W	Lf	ød	a	b		
TSM 1004	100	48	4	8	31.75	7.92	35.2	10	0.15
1005	100	48	5	8	31.75	7.92	35.2	10	0.20
1006	100	48	6	8	31.75	7.92	35.2	10	0.30
TSM 1254	125	58	4	8	31.75	7.92	35.2	12	0.35
1255	125	58	5	8	31.75	7.92	35.2	12	0.40
1256	125	58	6	8	31.75	7.92	35.2	12	0.45
1258	125	58	8	10	31.75	7.92	35.2	12	0.60
TSM 1604	160	58	4	8	38.10	9.52	42.3	16	0.50
1605	160	58	5	8	38.10	9.52	42.3	16	0.60
1606	160	58	6	8	38.10	9.52	42.3	16	0.70
1608	160	58	8	10	38.10	9.52	42.3	16	0.95

Inserts are not included.
* All the above items are made-to-order.

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



Grade		Carbide
Application	High Speed/Light	
	General Purpose	PK
	Roughing	

Cat. No.	A30	Dimensions (mm)		Applicable Cutters
		A	s	
SNHG 121		12.7	2.2	TSM1004 / TSM1254 / TSM1604
122		12.7	2.7	TSM1005 / TSM1255 / TSM1605
123		12.7	3.2	TSM1006 / TSM1256 / TSM1606
124		12.7	4.3	TSM1258 / TSM1608

Spare Parts

Applicable Cutters	Spanner Support	Screw	N·m	Spanner
TSM1004	TP43	BFNX0303	2.0	TRX10
TSM1254				
TSM1604				
TSM1005	TP53	BFNX0304	2.0	TRX10
TSM1255				
TSM1605				
TSM1006	TP64	BFNX0405	3.5	TRD20
TSM1256				
TSM1606				
TSM1258	TP84	BFNX0407	3.5	TRD20
TSM1608				

N·m Recommended Tightening Torque (N · m)

SEC-Chamfering Endmills

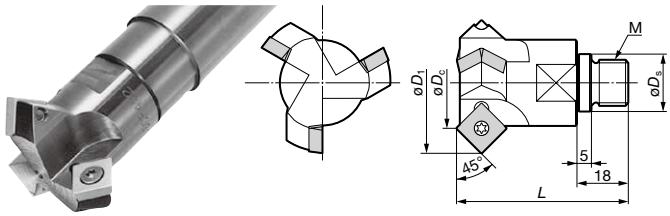
SCP Type

Rake Angle		
	Radial	0°
	Axial	0°

45°

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

Countersinking



Illustrations show SCP432.

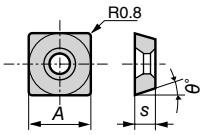
Body

Cat. No.	Stock	Dimensions (mm) øDc	øD1	L	M	øDs	No. of Teeth	Diameter to be Chamfered
SCP 308	●	**8**	20.1	50	**M12**	14	1	ø 8.5 to 19.7
419		**19**	35.6	56	**M12**	14	2	ø19.5 to 35.1
432	●	**32**	48.6	60	**M16**	20	3	ø32.5 to 48.1

Inserts are not included.

Inserts

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



Grade		Coated Carbide		Carbide					
Application	High Speed/Light								
	General Purpose	P M			P	K			
	Roughing	P M							

Cat. No.	ACP200		A30N	G10E	Dimensions A	s	θ°	Applicable Endmill
SDMA 322				●	9.525	3.18	15°	SCP 308
322T			●		9.525	3.18	15°	
SPMA 432				●	12.70	4.76	11°	SCP 419 /SCP 432
432T			●		12.70	4.76	11°	

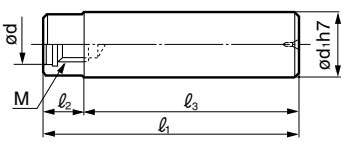
Spare Parts

Screw		Spanner	Applicable Endmill
	N·m		
BFTX 0407N	2.0	TRX 10	SCP 308
BFTX 0511N	5.0	TRX 20	SCP 419, SCP 432

N·m Recommended Tightening Torque (N · m)

Arbour

Units: (mm)



Cat. No.	Stock	Dimensions ød	ød1	M	ℓ1	ℓ2	ℓ3	Applicable Endmill
SCA 20	●	14	20	**M12**	105	20	85	SCP308 SCP419
32		20	32	**M16**	130	20	110	SCP432

SEC-Chamfering Endmills

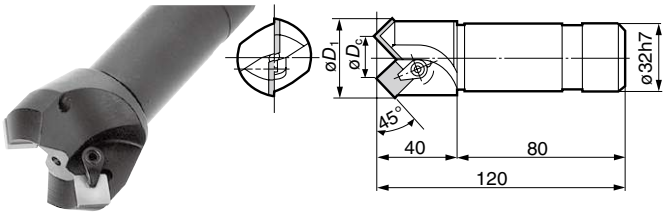
SMC Type

Rake Angle		
	Radial	0°
	Axial	0°

45°

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

Countersinking



Illustrations show SMC420.

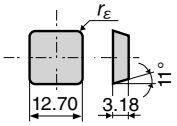
Body

Cat. No.	Stock	Dimensions (mm) øDc	øD1	No. of Teeth	Diameter to be Chamfered
SMC 407	●	**7**	24.3	1	ø11.0 to ø23.8
420	●	**20**	37.3	2	ø21.2 to ø36.8
435	●	**35**	52.3	2	ø36.2 to ø51.8

Inserts are not included.

Inserts

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



Grade		Coated Carbide		Carbide			Cermet		
Application	High Speed/Light	K					P	P	
	General Purpose	K		P	P K	K			P
	Roughing		K						

Cat. No.	ACK200	ACK300		ST20E	A30	G10E	T1500A	T1200A	T250A	Dimensions r_ε
SPMN 422				●	●	●	●	▲	●	0.8
423	●	●			●	●	●	▲		1.2
SPG 422				●	●	●	●	▲		0.8

Spare Parts

Clamp	Double Screw		Spanner
	Size	N·m	
CCM6BR	WB6-16	**M6**	5.0	LH030

N·m Recommended Tightening Torque (N · m)

Usage

(1) Single Side	(2) Double Side	(3) Hole Chamfering	(4) Stepping	(5) Milling	
				①	②

HF Type

■ General Features

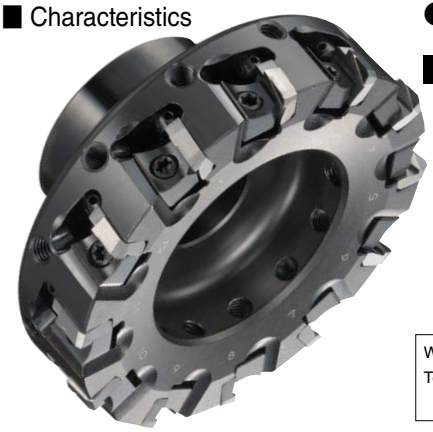
The HF Type high-efficiency aluminum cutter employs unique insert design to eliminate burrs and to achieve machining without burrs.

Work Material

- Aluminum and aluminum alloys
- Other non-ferrous metal

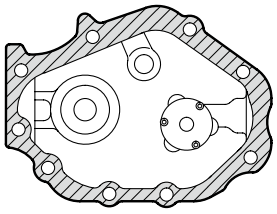
(Not suited for cast iron or steel.)

■ Characteristics

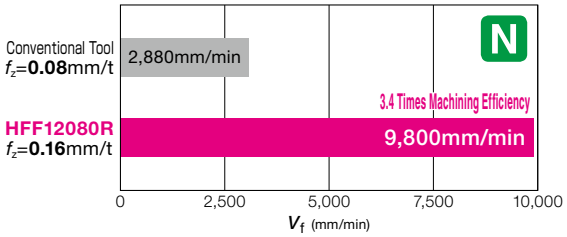


● Achieves high-efficiency milling with vf of over 20,000mm/min thanks to its multi-edge design (3 edges per inch).

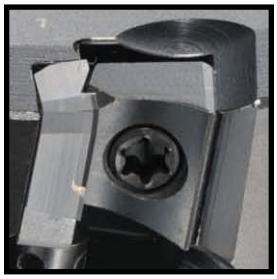
High Feed, High-efficiency Milling by Multi-edge Design



Work : Aluminum Case (Frame Milling)
Tool : **HFF12080R-25.4** (ø80 10 Flutes), Conventional (ø80 6 Flutes)



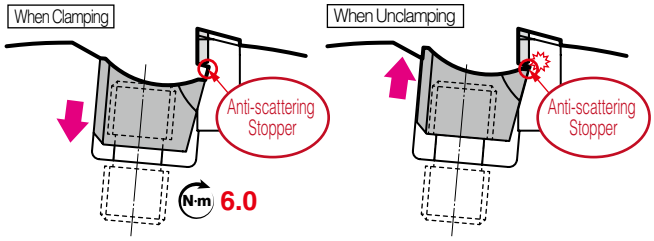
Cutter (mm)	s max (min⁻¹)	v_c (m/min)	f_z (mm/t)	Max. Number of Edges (Edge)	V_f (mm/min)
ø80	11,000	2,763	to 0.2	10	to 22,000
ø100	9,500	2,983	to 0.2	12	to 22,800
ø125	7,500	2,944	to 0.2	15	to 22,500

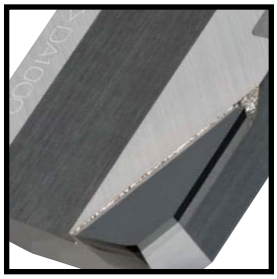


● The wedge clamp with anti-scattering mechanism ensures safety and operability.

Shape and structure to prevent scattering outside. Scattering by centrifugal force is prevented even when loosened by vibration.

Ensure that the maximum allowable spindle speed (s max) specified for each cutter diameter is not exceeded. Failing to do so is very dangerous. (*See the table on the upper right.)

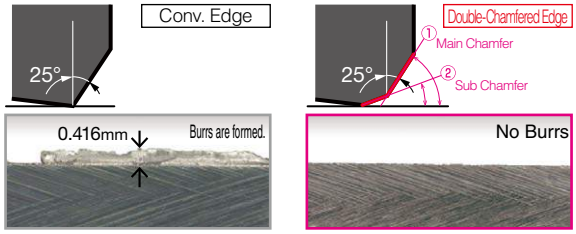




● Reduces burrs by using a double-chamfered cutting edge.

Drastically reduces burrs by preventing the plastic deformation that causes burrs.

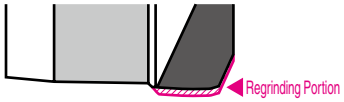
Work Material : **A6061** Blanks
Cutting Conditions : v_c=**3,142**m/min, f_z=**0.10**mm/t, a_p=**0.5**mm, Dry

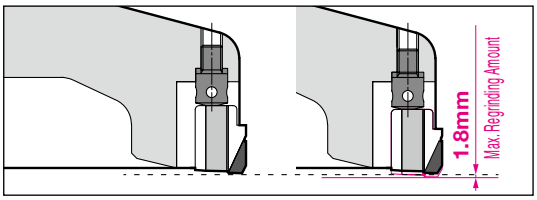


● Reduces running costs by drastically increasing the insert regrinding amount (to 1.8mm).

Assuming the amount of regrinding to be 0.2mm, an edge can be used up to 10 times.

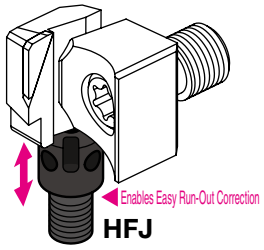
(* Given the condition of normal wear with ap of 1.4mm or less)

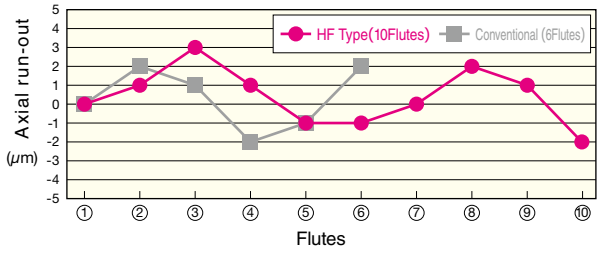




The regrinding amount has been drastically increased compared to conventional screw-lock types.

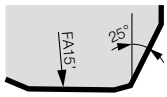
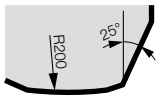
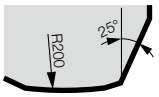
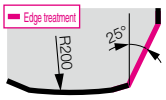
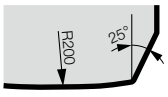
● Achieves a run-out precision of 5μm or less by employing an easy fine-tuning mechanism.

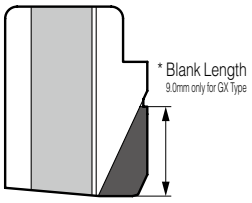




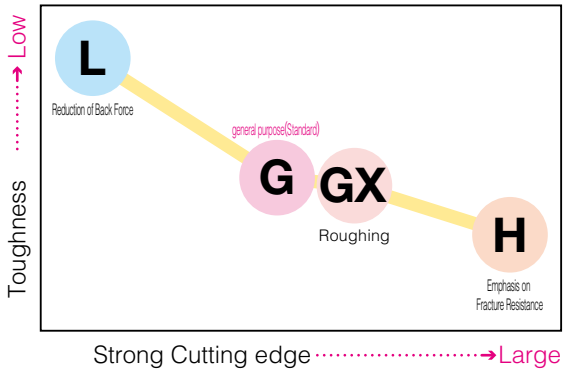
HF Type

Edge Selection Guide

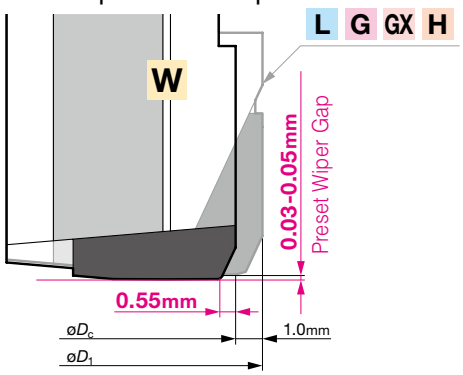
Work Material	N				
Type	L	G	GX	H	W
Cutting Edge Insert Figure					
Characteristics	Low cutting force	Standard	Long Edge	High Strength	Wiper
Application	Reduction of Back Force	general purpose	Roughing	Emphasis on Fracture Resistance	
Blank Length (*)	6.0mm	6.0mm	9.0mm	6.0mm	



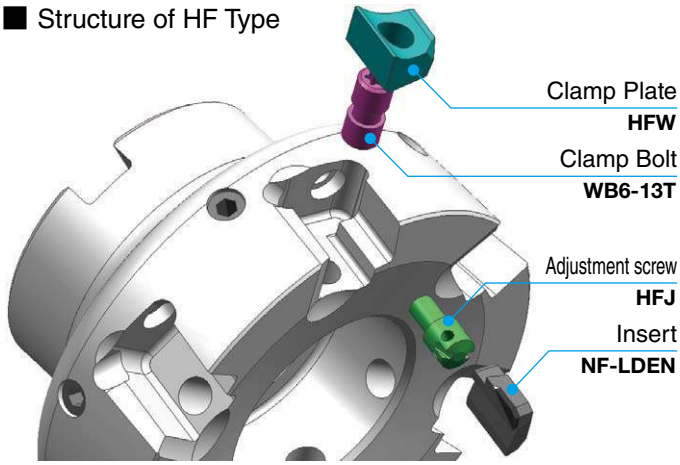
Guideline for Edge Selection



Amount of Wiper Insert Gap



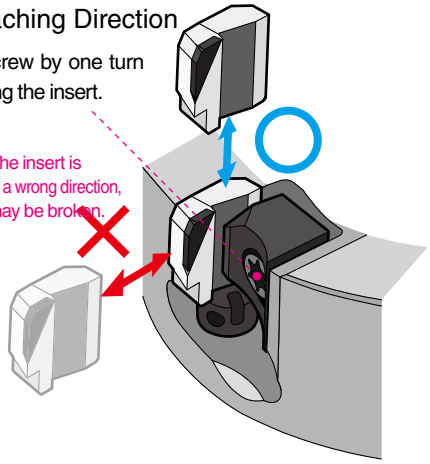
Structure of HF Type



Insert Attaching Direction

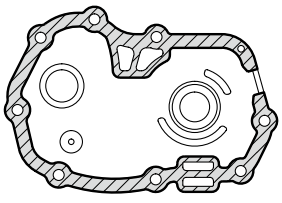
Loosen the screw by one turn before removing the insert.

⚠ Be aware that if the insert is forcibly removed in a wrong direction, the equipment may be broken.

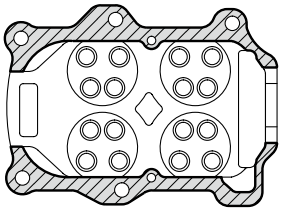


Application Examples

● Work : Crankcase Cover		SEH Product	Competitor's Product
Work Material : **Al**	Tool	**HFF12080R**	ø80
	Grade	**DA1000**	PCD
	No. of Teeth	10	8
	V_c (m/min)	2,510	2,510
	S (min^{-1})	10,000	10,000
	V_f (mm/min)	8,000	6,400
	f_z (mm/t)	0.08	0.08
	a_p (mm)	1.2	1.2
	Coolant	Wet	Wet
	Results	Improves machining efficiency 1.25 times. Excellent surface roughness of Ra=1.0μm or less.	



● Work : Engine Component		SEH Product	Competitor's Product
Work Material : **Al**	Tool	**HFF12100R**	ø100
	Grade	**DA1000**	PCD
	No. of Teeth	12	8
	V_c (m/min)	2,000	2,000
	S (min^{-1})	6,370	6,370
	V_f (mm/min)	4,585	3,060
	f_z (mm/t)	0.06	0.06
	a_p (mm)	0.8	0.8
	Coolant	Wet	Wet
	Results	Improves machining efficiency 1.5 times. 1.5 times longer tool life (Increases the number of units machined from 3000 to 4000.)	



HF Type

Rake Angle		
	Radial	+4°
	Axial	+10°

3mm 90°

P Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous Metal	N Aluminum	S Exotic Alloy	H Hardened Steel
×	×	×	○	◎	×	×

Fig 1

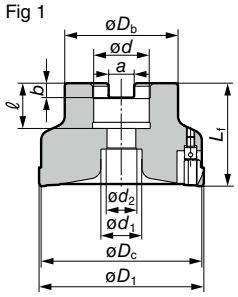


Fig 2

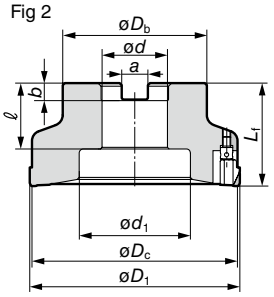
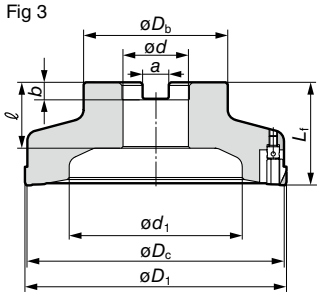


Fig 3



■ Body (Course Pitch : 2 Flutes/Inch)

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. 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
Imperial	**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

Inserts are not included.

■ Insert

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

Grade		SUMIDIA	
Application	High Speed/Light	N	
	General Purpose	N	
	Roughing	N	

Units (mm)

Cat. No.	DA1000		Cutting Edge Length	Unique wiper edge	Application	Fig
NF-LDEN 12T3ZDFR-L	●		6	Straight	general purpose	4
12T3ZDFR-G	●		6	Arc	general purpose	4
12T3ZDTR-H	●		6	Arc	Strong edge	4
12T3ZDFR-GX			9	Arc	Long Edge	5
12T3ZDFR-W			—	Arc	Wiper	6

Fig 4

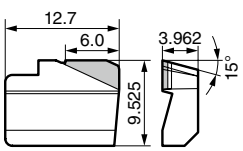


Fig 5

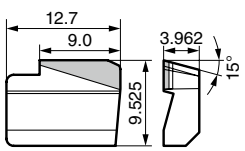
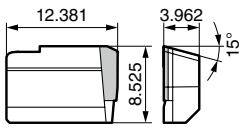


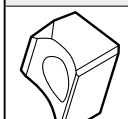
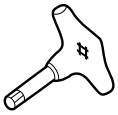
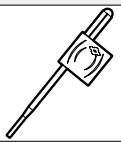
Fig 6

Wiper Insert



■ Parts

(Optional)

Clamp Plate	Clamp Bolt		Adjustment screw	Adjusting Wrench	Spanners	Assembling Wrench
						 (Sold Separately)
HFW	WB6-13T	6.0	HFJ	TTX20	RFT	HFVT

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

Si content of 12.6% or less.

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
N	Aluminium Alloy	—	2000- **2500** -3000	0.05- **0.13** -0.20	DA1000

Si content of over 12.6%

N	Aluminium 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, cutting depth, and other factors.

■ Identification Details

HF M 12 080 R S -22

(1) Cutter Series
(2) M : Fine Pitched F : Extra-Fine Pitched
(3) Insert Size
(4) Cutter
(5) Direction
(6) Metric Bore
(7) Oil Hole

HF Type

Rake Angle		
	Radial	+4°
	Axial	+10°

3mm 90°

P Steel	M Stainless Steel	K Cast Iron	N Non-Ferrous Metal	N Aluminum	S Exotic Alloy	H Hardened Steel
×	×	×	○	◎	×	×

Fig 1

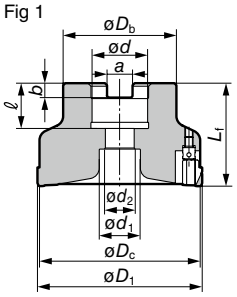


Fig 2

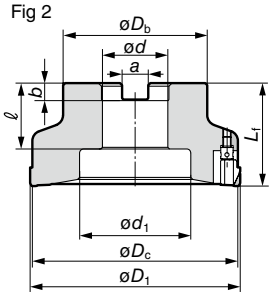
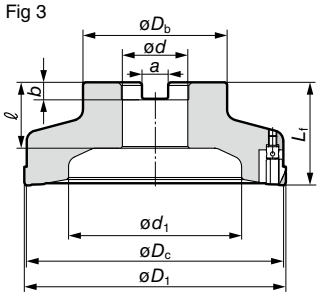


Fig 3



■ Body (Fine : 3 Flutes/Inch)

	Cat. No.	Stock	Dimensions (mm) øDc	øD1	øDb	Lf	ød	a	b	ℓ	ød1	ød2	No. 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
Imperial	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

Inserts are not included.

■ Insert

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

Grade		SUMIDIA	
Application	High Speed/Light	N	
	General Purpose	N	
	Roughing	N	

Cat. No.	DA1000		SUMIDIA Cutting Edge Length	Unique wiper edge	Application	Fig
NF-LDEN 12T3ZDFR-L	●		6	Straight	general purpose	4
12T3ZDFR-G	●		6	Arc	general purpose	4
12T3ZDTR-H	●		6	Arc	Strong edge	4
12T3ZDFR-GX			9	Arc	Long Edge	5
12T3ZDFR-W			—	Arc	Wiper	6

Fig 4

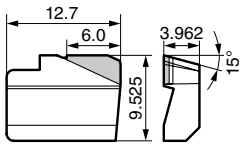


Fig 5

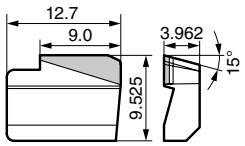
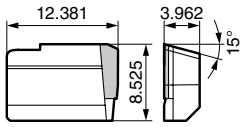


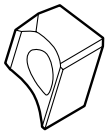
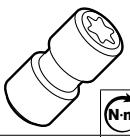
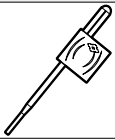
Fig 6

Wiper Insert



■ Parts

(Optional)

Clamp Plate	Clamp Bolt		Adjustment screw	Adjusting Wrench	Spanners	Assembling Wrench
		N·m				 (Sold Separately)
HFW	WB6-13T	6.0	HFJ	TTX20	RFT	HFVT

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

Si content of 12.6% or less.

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
N	Aluminium Alloy	—	2000- **2500** -3000	0.05- **0.13** -0.20	DA1000

Si content of over 12.6%

N	Aluminium 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, cutting depth, and other factors.

■ Identification Details

HF F 12 080 R S -22

(1) Cutter Series
(2) M : Fine Pitched F : Extra-Fine Pitched
(3) Insert Size
(4) Cutter
(5) Direction
(6) Metric Bore
(7) Oil Hole

RF Type

General Features

The RF type cutter has a special light weight Aluminium body, designed for high speed, high efficiency roughing to finish milling of Aluminium and other non-ferrous metals.

Work Material

- Aluminium and aluminium alloy
- Other non-ferrous metal

(Not suited for cast iron or steel)

Characteristics

- **From Roughing to Finishing Processes :** Roughing : Economical carbide insert / High-precision finishing with SUMIDIA
- **Strong and Light Cutter Body :** Special Aluminium body /40% lighter than steel cutters / Hard-anodized plated body / Improved efficiency in higher rotational speeds, lower spindle loads and shorter tool change time
- **Safe Design :** Anti-centrifugal force design to prevent inserts from dislodging from cutter (Speeds must be within max. recommended conditions) /Non-wedge design to prevent deformation
- **Easy Run-out Adjustment :** External setting gauge is used for easy tool presetting / High precision cutter construction, units fitted are within 10 μm even before setting

Application Examples

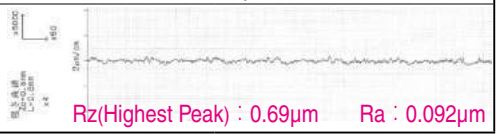
Work (Work Material)	Cutter Insert (Grade)	Cutting Conditions v_c = Cutting Speed (m/min) v_f = Feed Rate (mm/min) a_p = Depth of Cut (mm)	Results
Case (ADC12)	RF4160R SUMIDIA Blade (DA2200)	v_c = 3,000 v_f = 5,730 a_p = 0.10	Surface Finish: Ra=0.2μm Output: 30,000 units 30x tool life of carbide tool
Contact Surface of Transmission Case (ADC12)	RF4125R SUMIDIA Insert (DA1000)	v_c = 3,000 v_f = 7,640 a_p = 1.5	Surface Finish: Ra=0.3μm Output: 20,000 units
Contact Surface of Cylinder Head (AC4C)	RF4250R Carbide Insert (H1)	v_c = 2,000 v_f = 7,535 a_p = 3.5	Rough Cutting Output: 10,000 units

Maximum Allowable Spindle Speed

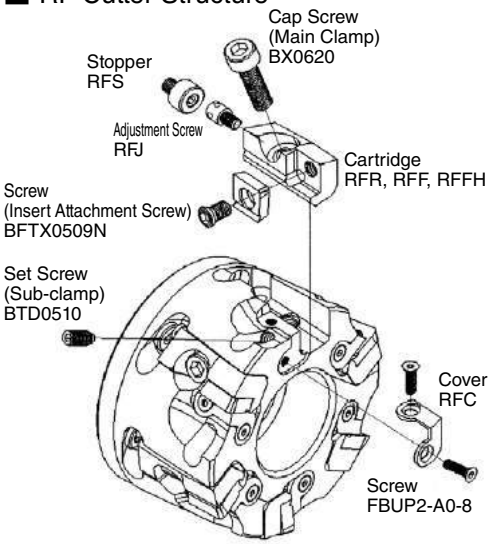
Cat. No.	n max (min $^{-1}$)
RF4080R	17,000
RF4100R	15,900
RF4125R	13,500
RF4160R	11,000
RF4200R	9,000
RF4250R	7,600
RF4315R	6,000

Surface Finish

- Process: Finish Milling
- M/C: Machining Centre
- Arbour: HSK63A
- Work: Si 10 to 12% Al Alloy
- Cutter: RF4100R 6 Teeth (1 Wiper)
- Grade: SUMIDIA (DA1000)
- v_c = 4,990m/min
- n = 15,900min-1
- v_f = 11,400mm/min
- f_z = 0.12mm/t
- a_p = 0.5mm、Wiper a_p = 0.03mm
- Dry



RF Cutter Structure



Recommended Cutting Conditions

Si content of 12.6% or less

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
N	Aluminium Alloy	—	2000-**3500**-5000	0.05-**0.13**-0.20	DA1000 DA2200
		—	1000-**1750**-2500	0.05-**0.13**-0.20	H1

Si content of 12.6% or less

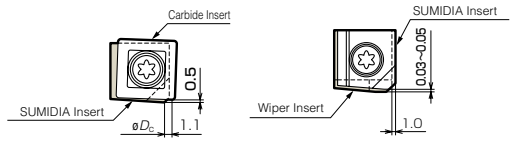
N	Aluminium Alloy	—	400-**600**-800	0.05-**0.13**-0.20	DA1000 DA2200
		—	200-**300**-400	0.05-**0.13**-0.20	H1

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

Insert Setup

For setting of Carbide inserts with SUMIDIA inserts/ blade

- Roughing and finishing in the same process
- When using wiper edge



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 even inserts with different regrinding amount on the same cutter.
- Carbide and SUMIDIA inserts must be arrange in an alternate manner.
- Ensure proper balancing by fixing SUMIDIA inserts of blades on opposite positions of the cutter.

High Speed Aluminum Cutter

RF 4000 Type

High-speed Finishing for Non-Ferrous Metal

RF4080R only

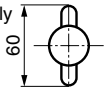


Fig 1

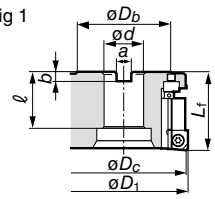
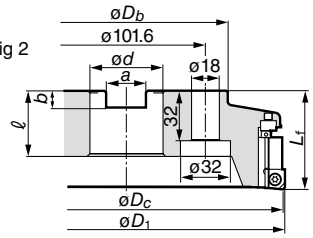


Fig 2



Body Imperial

Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Weight (kg)	Fig
		øD_c	øD_1	øD_b	L_f	ød	a	b	ℓ			
RF 4080R	●	**80**	82	60	50	**25.40**	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	**38.10**	15.9	10	38	8	1.6	1
4160R	●	**160**	162	100	63	**50.80**	19.1	11	38	10	2.6	1
RF 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

* Please use a collar bolt for securing the cutter to the arbour.

Inserts / Cartridges

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

Grade		Carbide	DLC-Coat	SUMIDIA		SUMICRYSTAL
Application	High Speed/Light	N	N	N	N	N
	General Purpose	N	N	N	N	
	Roughing	N	N	N	N	

Refer to page M44 for details of SUMICRYSTAL.

Cat. No.	H1	DL1000	DA1000	DA2200	SC10	Fig	Cartridge Cat. No.	Stock	Fig
SDET 1204ZDFR	●	●	—	—	—	3	RFR	●	8
NF-SNEW 1204ADFR	—	—	●	▲	—	4	RFF	●	9
120404ADFR-H	—	—	●	—	—	5	RFF(Others) * RFFH(RF4080R)	●	9
1204ADFR-W	—	—	●	▲	—	6	RFF	●	9
SNEW 1204ADFR-WS	—	—	—	—	●	7	RFF	●	9

Cartridge

Fig 8

(RFR)

Fig 9

(RFF)

* When using large depth of cut (a_p = 3mm or longer) with RF4080R, use RFFH unit. (RFF is possible for normal cutting.)

* Wiper inserts are indicated by a -W or -WS suffix. -H indicates deep cutting (a_p) insert

Fig 3

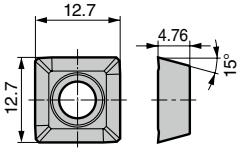


Fig 4

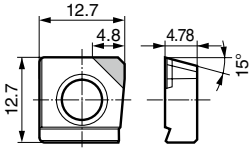


Fig 5

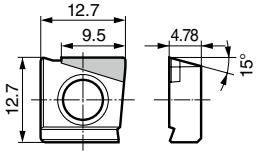


Fig 6 Surfing Insert

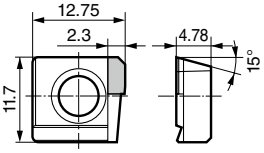
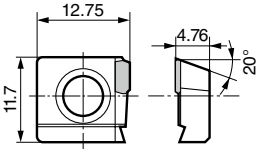
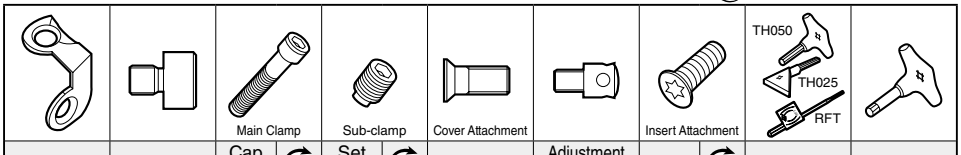


Fig 7 Surfing Insert



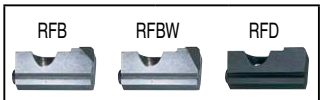
Spare Parts

N·m Recommended Tightening Torque (N·m)



Cover	Stopper	Main Clamp: Cap Screw	N·m	Sub-clamp: Set Screw	N·m	Cover Attachment: Screw	Adjustment Screw	Insert Attachment: Screw	N·m	Spanners	Spanners
RFC	RFS	BX 0620	10.0	BTD 0510	3.0	FBUP2 -A0-8	RFJ	BFTX 0509N	6.0	TH050 TH025 RFT	TTX20

Blades / Dummy Blades



Description	Cat. No.	SUMIDIA DA2200
SUMIDIA Blade	RFB	●
SUMIDIA Wiper Blade	RFBW	●
Dummy Blade	RFD	●(Steel)

* Protect the body as well as maintain balance by using dummy blades for unused teeth.

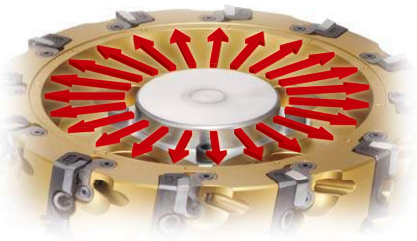
Internal Coolant Attachments

Use an internal coolant holder or a standard clamp bolt with coolant hole when using internal coolant. Typical examples are given in the table below. For standards, contact each manufacturer directly.

Body Cat. No.	Internal Coolant Holder	Standard Clamp Bolt with Coolant Hole (Ex.) MST Corporation	Big Daishowa Seiki Co. Ltd.
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	—	—

Internal Coolant Holder
RF-CLT (Standard stocked item)

Standard Clamp Bolt with Coolant Hole
[Representative example] MBC-M12 to M24 (Sold Separately)



Direction of Coolant Supply

External Setting Parts

Cartridge design allows inserts to be mounted away from the machine with high precision.

Setting Gauge
RF-SET (Sold separately, Standard stocked item)

Clamp Jig
RF-JIG (Sold separately, Standard stocked item)

SRF Type

General Features

Small diameter milling cutter SRF type is most suited for high-speed aluminium machining on small machines.

Characteristics

- **Best Suited For Small Machines**
  Especially reliable on BT30 class small machines.
- **From Roughing To Finishing Processes Utilising SUMIDIA DA1000**
  Insert with a side edge of 5mm.
- **Economical NF-type Inserts**
  NF-type SUMIDIA DA1000 inserts lower tooling costs.
- **High Speed Cutting With SUMIDIA**
  Maximum spindle speeds of up to n = 20,000min^{-1}
  (Actual spindle speeds must be set within the rotational limits of your machine and arbour.)
- **Simple design for insert run-out**
  Simple insert mounting design for easy yet precise tool adjustments.

Application Examples

Work (Work Material)	Cutter Insert (Grade)	Cutting Conditions n = Spindle Speed (min^{-1}) v_f = Feed Rate (mm/min) a_p = Depth of Cut (mm)	Results
Cam Case (ADC12)	SRF50R NF-SNEW09T3ADTR (DA1000)	n =6,000 v_f =2,400 a_p=0.5	12,000 pcs produced with no problems.
Computer Case (ADC12)	SRF50R NF-SNEW09T3ADTR (DA1000)	n =15,000 v_f =7,500 a_p=0.2	Improved efficiency of endmill operation by 2.5 times.
Differential Case (ADC12)	SRF63R NF-SNEW09T3ADTR (DA1000)	n =8,000 v_f =4,000 a_p=0.5	No obstructions on tool magazine when mounting ø63mm cutter on small machines.

Recommended Cutting Conditions

Si content of 13% or less.

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min.- **Optimum** -Max.	Feed Rate f_z (mm/t) Min.- **Optimum** -Max.	Grade
N	Aluminium Alloy	—	2,000- **3,000** -4,000	0.05- **0.13** -0.20	DA1000

Si content of over 13%

N	Aluminium 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, cutting depth, and other factors.

SRF Type

Rake Angle		
	Radial	−2° to +4°
	Axial	+6°

5mm 90°

P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | N Aluminum | S Exotic Alloy | H Hardened Steel

High-speed Finishing for Non-Ferrous Metal

Fig 1

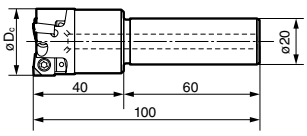


Fig 2

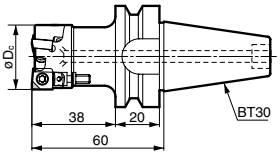


Fig 3

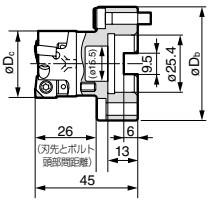
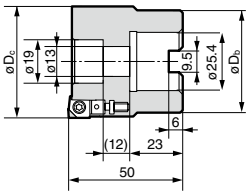


Fig 4

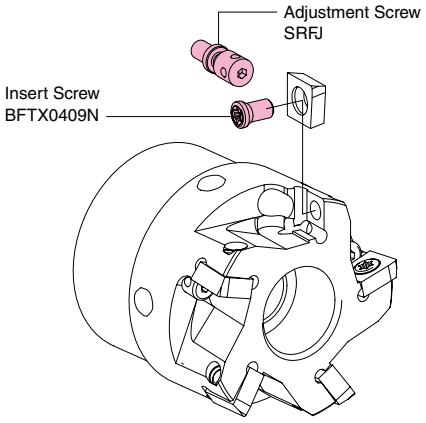


Body Imperial

Cat. No.	Stock	øD_c(mm)	øD_c(mm)	No. of Teeth	Fig.	Weight (kg)
SRF 30R-ST	●	**30**	—	3	1	0.34
40R-ST	●	**40**	—	4	1	0.50
SRF 30R-BT30	●	**30**	—	3	2	0.57
40R-BT30	●	**40**	—	4	2	0.72
SRF 30R	●	**30**	**50.0**	3	3	0.27
40R	●	**40**	**50.0**	4	3	0.35
50R	●	**50**	**46.5**	5	4	0.59
63R	●	**63**	**45.0**	6	4	0.67

Inserts are not included.

Please use hexagonal bolt (JISB1176) M12 x 30-35 mm for securing ϕ50 and ϕ63 cutter to the arbour.



Inserts

Wiper Insert

Fig 5

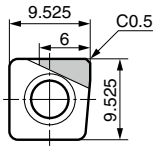


Fig 6

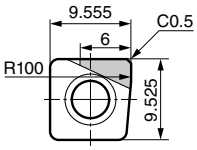
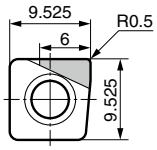
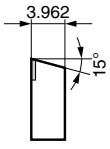


Fig 7



Side View (Same For All)

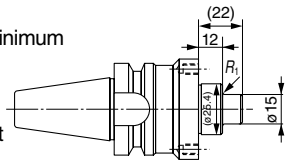


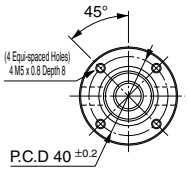
P Steel | M Stainless Steel | K Cast Iron | N Non-Ferrous Metal | S Exotic Alloy | H Hardened Steel

Grade		SUMIDIA	
Application	High Speed/Light	N	N
	General Purpose	N	N
	Roughing	N	N

Cat. No.	DA1000	DA2200	Fig	Cutting Edge
NF-SNEW 09T3ADTR	●	▲	5	Standard
09T3ADTR-U	●	▲	6	Wiper
09T3ADTR-R	●	▲	7	Nose Radius

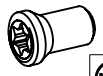
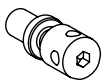
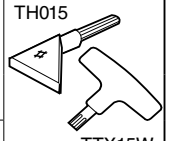
- Standard inserts and wiper inserts can be used on the same cutter body.
- Inserts with nose radius can reduce the clattering. These cannot be used with wiper inserts.
- Inserts can be reground 3 times (up to minimum IC diameter 9.225mm).
- Do not mix new and reground inserts, or even inserts with different regrind amount on the same cutter.
- When using reground inserts, it is advisable to re-confirm insert height and cutting diameter with a tool pre-setter.
- Arbour for SRF30R, SRF40RS





When using SRF30R and SRF40R cutters, there is a requirement to modify the arbour as shown above.
(1. Reduce part of the arbour's adaptor shaft from ø25.4mm to ø15mm.
2. Add 4 tap holes for (M5) cap screws.) Please use a hexagonal bolt M5 x 20 mm for securing the body.

Spare Parts

Insert Screw	Adjustment Screw	Spanners
		 TH015
BFTX0409N (N·m) 4.0	SRFJ	TTX15W

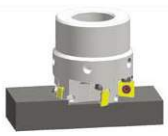
(N·m) Recommended Tightening Torque (N·m)

Maximum Depth Of Cut Guide (SRF50R, 5 Teeth)

The table below contains guidelines on the maximum depth of cut determined from internal tests. ' ○ ' marks indicate the possible application range. Actual cutting conditions should be set based on actual machine and work characteristics.

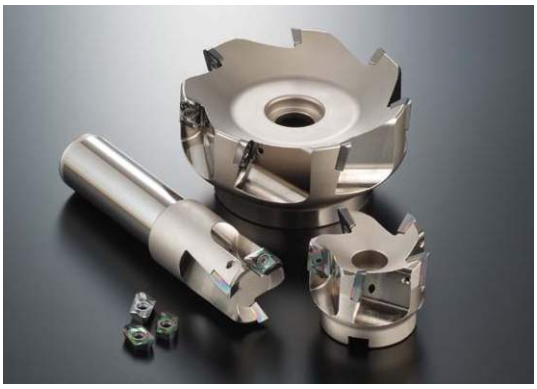
Depth of Cut a_p(mm) \ Feed Rate	Feed Rate v_f (mm/min)		
	2,500	4,000	5,000
	Feed Rate Per Tooth f_z (mm/t)		
	0.05	0.08	0.10
0.5	○	○	○
1.0	○	○	○
1.5	○	○	○
2.0	○	○	○
2.5	○	○	○
3.0	○	○	○
3.5	○	○	—
4.0	○	—	—
4.5	○	—	—
5.0	○	—	—

Cutting Conditions
Cutter: SRF50R
Insert: NF-SNEW 09T3ADTR (DA1000)
n = 10,000min^{-1}
Arbour: BT30 FMA25.4-45
Work: A-5052
Width: 35mm at depth of cut indicated above



▲mark :To be replaced by new item (Please confirm stock availability)

WAX Type



General Features

SEC-WaveMill WAX type is a high speed and high efficiency cutter capable of rough milling to finishing of Non-Ferrous Metals such as Aluminium alloy.

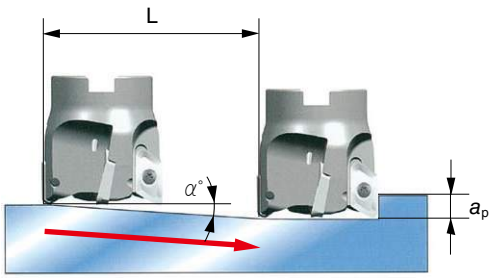
Characteristics

- For Ramping (Slant Milling)
- For Helical Milling
- Safety Design
  Prevents dislodging of inserts caused by centrifugal forces.
- Coolant Supply
  Coolant holes are a standard feature for the whole series.
- Excellent Adhesion Resistance
  - Top rake face of the insert is lapped finish.
  - DLC Coat inserts are available for improved adhesion resistance.

Ramping (Slant Milling)

Maximum ramping angle (α° max.) depends on cutter diameter.
Minimum milling length (L min) is the ramping distance required to reach the maximum cutting depth (a_p max) at the maximum ramping angle of that cutter.
Minimum milling length (L) for any depth can be calculated by the equation below:

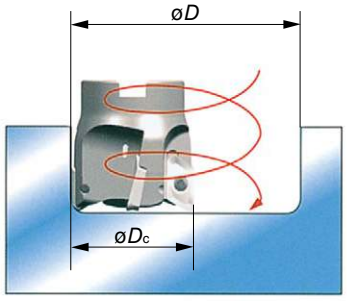
$$L = \frac{a_p}{\tan \alpha^\circ} \text{ (mm)}$$



Ramping (Slant Milling) Angles

Cutter Diameter øDc(mm)	Max. Ramping Angle α° max	
	WAX3000 Type	WAX4000 Type
20	28°	
25	17°	26°
32	12°	18°30'
40	9°	13°
50	7°	9°30'
63	5°	7°
80	3°	5°
100	3°	4°
125	2°	3°

Helical Milling



Helical Milling Diameter

Cutter Diameter øDc(mm)	WAX3000 Type		WAX4000 Type	
	Minimum Diameter	Maximum Diameter	Minimum Diameter	Maximum Diameter
20	22	33		
25	29	43	27	43
32	43	57	38	57
40	59	73	54	73
50	79	93	74	93
63	105	119	100	119
80	139	153	134	153
100	179	193	174	193
125	229	243	224	243

Maximum Allowable Spindle Speed

Cutter Diameter øDc(mm)	WAX3000 Type		WAX4000 Type	
	n max(min-1)	vc(m/min)	n max(min-1)	vc(m/min)
20	14,000	880		
25	29,000	2,200	11,000	860
32	25,000	2,500	9,000	900
40	23,000	2,900	20,000	2,500
50	20,000	3,100	18,000	2,800
63	18,000	3,500	16,000	3,100
80	16,000	4,000	14,000	3,500
100	14,000	4,400	12,000	3,700
125	13,000	5,100	11,000	4,300

The n max speeds are set to prevent the inserts from dislodging by centrifugal forces.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed vc (m/min) Min.- **Optimum** -Max.	Feed Rate fz (mm/t) Min.- **Optimum** -Max.	Grade
N	Aluminium Alloy	—	600-**900**-1200	0.05-**0.15**-0.25	DL1000

Note: The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

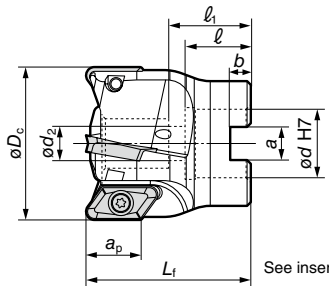
SEC-WaveMill

WAX 3000 Type

Rake Angle		
	Radial	6°
	Axial	19° to 25°

16 to 18mm 90°

P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	N Aluminum	S Exotic Alloy	H Hardened Steel
×	×	×	○	◎	×	×



See insert table for "a_p".

Body (For inserts with nose radius 3.2mm and below)

	Cat. No.	Stock	Dimensions (mm) øDc	ød	Lf	ød2	a	b	ℓ	ℓ1	No. of Teeth	Weight (kg)
Metric	WAX 3050-3.2	●	50	22	50	11	10.4	6.3	21	26	4	0.34
	3063-3.2	●	63	22	50	11	10.4	6.3	21	26	5	0.6
Imperial	WAX 3080-3.2	●	80	25.4	50	14	9.5	6	25	31	5	1.0
	3100-3.2	●	100	31.75	63	17	12.7	8	32	39	6	2.2
	3125-3.2	●	125	38.1	63	21	15.9	10	35	40	7	3.5

Body (For inserts with nose radius 4.0mm and above)

	Cat. No.	Stock	Dimensions (mm) øDc	ød	Lf	ød2	a	b	ℓ	ℓ1	No. of Teeth	Weight (kg)
Metric	WAX 3050-4.0	●	50	22	50	11	10.4	6.3	21	26	4	0.34
	3063-4.0	●	63	22	50	11	10.4	6.3	21	26	4	0.6
Imperial	WAX 3080-4.0	●	80	25.4	50	14	9.5	6	25	31	5	1.0
	3100-4.0	●	100	31.75	63	17	12.7	8	32	39	6	2.2
	3125-4.0	●	125	38.1	63	21	15.9	10	35	40	7	3.5

Inserts are not included.

Spare Parts (3000 Type common)

Screw		Spanner	Anti-seizure Cream	Applicable Endmill
	N·m			
BFTX0408	3.0	TRD15	SUMI-P	WAX3000 Type WAX3000E / EL Type

N·m Recommended Tightening Torque (N·m)

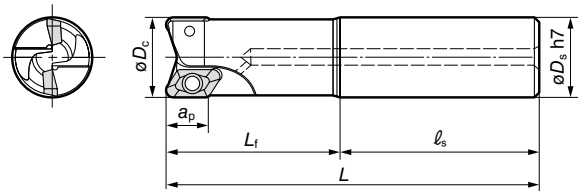
SEC-WaveMill

WAX 3000E/3000EL Type

Rake Angle		
	Radial	6°
	Axial	19° to 25°

16 to 18mm 90°

P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	N Aluminum	S Exotic Alloy	H Hardened Steel
×	×	×	○	◎	×	×



See insert table for "a_p".

Body (For inserts with nose radius 3.2mm and below)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	L	Lf	ℓs	No. of Teeth	Weight (kg)
WAX 3020E -3.2	●	20	20	130	60	70	1	0.25
WAX 3025E -3.2	●	25	25	140	60	80	2	0.42
3025EL-3.2	●	25	25	200	60	140	2	0.63
3032E -3.2	●	32	32	150	70	80	2	0.75
3032EL-3.2	●	32	32	220	70	150	2	1.2
WAX 3040E -3.2	●	40	32	160	70	90	3	1.0
3040EL-3.2	●	40	32	220	70	150	3	1.4

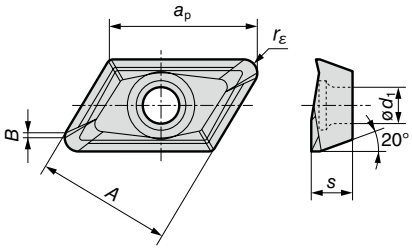
Body (For inserts with nose radius 4.0mm and above)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	L	Lf	ℓs	No. of Teeth	Weight (kg)
WAX 3020E -4.0	●	20	20	130	60	70	1	0.25
WAX 3025E -4.0	●	25	25	140	60	80	2	0.42
3025EL-4.0	●	25	25	200	60	140	2	0.63
3032E -4.0	●	32	32	150	70	80	2	0.75
3032EL-4.0	●	32	32	220	70	150	2	1.2
WAX 3040E -4.0	●	40	32	160	70	90	3	1.0
3040EL-4.0	●	40	32	220	70	150	3	1.4

Inserts are not included.

Inserts (3000 Type common)

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



Grade		Carbide	DLC
Application	High Speed/Light	K N	N
	General Purpose		N
	Roughing		

Cat. No.	H1	DL1000	Dimensions (mm) ap	A	B	rε	s	ød1
AECT 160404PEFRA	●	●	18	16.4	1.4	0.4	5	4.4
160408PEFRA	●	●	18	16.4	1.0	0.8	5	4.4
160412PEFRA	●	●	18	16.4	0.6	1.2	5	4.4
160416PEFRA	●	●	17.5	16.4	0.5	1.6	5	4.4
160420PEFRA	●	●	17.5	16.4	0.5	2.0	5	4.4
160430PEFRA	●	●	17	16.4	0.7	3.0	5	4.4
160432PEFRA	●	●	17	16.4	0.5	3.2	5	4.4
AECT 160440PEFRA	●	●	16.5	16.4	0.5	4.0	5	4.4
160450PEFRA	●	●	16	16.4	0.4	5.0	5	4.4

r_ε=4.0 or greater are for use with bodies that have a -4.0 cat. no. suffix.

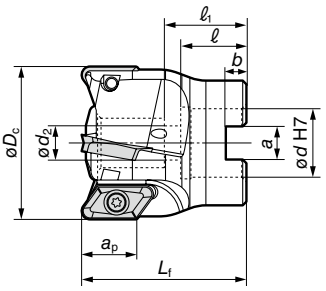
SEC-WaveMill

WAX 4000 Type

Rake Angle: Radial 6° / Axial 19° to 25°

22 to 24mm — 90°

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



See insert table for "a_p".

Body (For inserts with nose radius 3.2mm and below)

	Cat. No.	Stock	Dimensions (mm) øDc	ød	Lf	ød2	a	b	ℓ	ℓ1	No. of Teeth	Weight (kg)
Metric	WAX 4050-3.2	●	50	16	50	9	8.4	5.6	18	23	2	0.37
	4063-3.2	●	63	22	50	11	10.4	6.3	21	26	3	0.54
Imperial	WAX 4080-3.2	●	80	25.4	50	14	9.5	6	25	31	4	0.81
	4100-3.2	●	100	31.75	63	17	12.7	8	32	39	5	1.7
	4125-3.2	●	125	38.1	63	21	15.9	10	35	40	6	2.6

Body (For inserts with nose radius 4.0mm and below)

	Cat. No.	Stock	Dimensions (mm) øDc	ød	Lf	ød2	a	b	ℓ	ℓ1	No. of Teeth	Weight (kg)
Metric	WAX 4050-4.0	●	50	16	50	9	8.4	5.6	18	23	2	0.37
	4063-4.0	●	63	22	50	11	10.4	6.3	21	26	3	0.54
Imperial	WAX 4080-4.0	●	80	25.4	50	14	9.5	6	25	31	4	0.81
	4100-4.0	●	100	31.75	63	17	12.7	8	32	39	5	1.7
	4125-4.0	●	125	38.1	63	21	15.9	10	35	40	6	2.6

Inserts are not included.

Spare Parts (4000 Type common)

Screw		Spanner	Anti-seizure Cream	Applicable Endmill
	N·m			
BFTX0509N	5.0	TRD20	SUMI-P	ø25 to ø32
BFTX0511N	5.0	TRD20	SUMI-P	ø40 to ø125

N·m Recommended Tightening Torque (N·m)

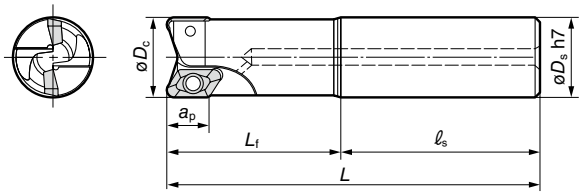
SEC-WaveMill

WAX 4000E/4000EL Type

Rake Angle: Radial 6° / Axial 19° to 25°

22 to 24mm — 90°

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



See insert table for "a_p".

Body (For inserts with nose radius 3.2mm and below)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	L	Lf	ℓs	No. of Teeth	Weight (kg)
WAX 4025E -3.2	●	25	25	140	60	80	1	0.41
4025EL-3.2	●	25	25	200	60	140	1	0.63
4032E -3.2	●	32	32	150	70	80	1	0.72
4032EL-3.2	●	32	32	220	70	150	1	1.2
WAX 4040E -3.2	●	40	32	160	70	90	2	0.88
4040EL-3.2	●	40	32	220	70	150	2	1.2

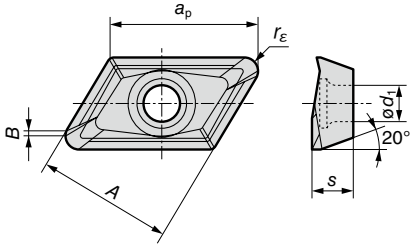
Body (For inserts with nose radius 4.0mm and below)

Cat. No.	Stock	Dimensions (mm) øDc	øDs	L	Lf	ℓs	No. of Teeth	Weight (kg)
WAX 4025E -4.0	●	25	25	140	60	80	1	0.41
4025EL-4.0	●	25	25	200	60	140	1	0.63
4032E -4.0	●	32	32	150	70	80	1	0.72
4032EL-4.0	●	32	32	220	70	150	1	1.2
WAX 4040E -4.0	●	40	32	160	70	90	2	0.88
4040EL-4.0	●	40	32	220	70	150	2	1.2

Inserts are not included.

Inserts (4000 Type common)

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



Grade		Carbide	DLC
Application	High Speed/Light	K N	N
	General Purpose		N
	Roughing		

Cat. No	H1	DL1000	Dimensions (mm) ap	A	B	rε	s	ød1
AECT 220604PEFRA	●	●	24	21.8	1.5	0.4	6.35	6.0
220608PEFRA	●	●	24	21.8	1.2	0.8	6.35	6.0
220612PEFRA	●	●	24	21.8	0.8	1.2	6.35	6.0
220616PEFRA	●	●	24	21.8	0.4	1.6	6.35	6.0
220620PEFRA	●	●	24	21.8	0.5	2.0	6.35	6.0
220630PEFRA	●	●	23	21.8	0.6	3.0	6.35	6.0
220632PEFRA	●	●	23	21.8	0.4	3.2	6.35	6.0
AECT 220640PEFRA	●	●	22	21.8	1.2	4.0	6.35	6.0
220650PEFRA	●	●	22	21.8	0.4	5.0	6.35	6.0

r_ε =4.0 or greater are for use with bodies that have a -4.0 cat. no. suffix.

BN Finish Mill EASY FMU FMU-E Type

Rake Angle		
	Radial	+2°
	Axial	+8°

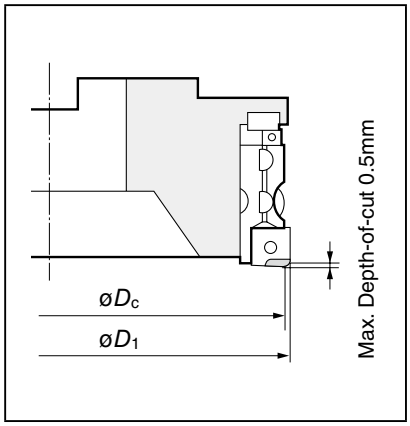
0.5mm 90°

P (Steel) M (Stainless Steel) K (Cast Iron) N (Non-Ferrous Metal) N (Aluminum) S (Exotic Alloy) H (Hardened Steel)

* Refer to L114 for technical information.

High-speed Finishing for Cast Iron

Max. D.O.C.



Assembly

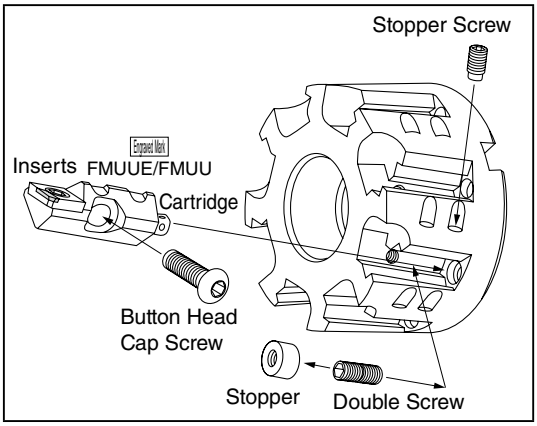


Fig 1

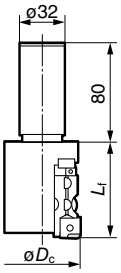


Fig 2

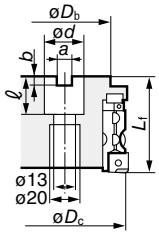


Fig 3

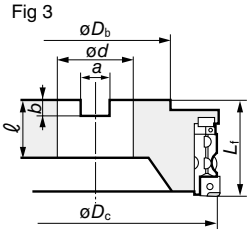


Fig 4

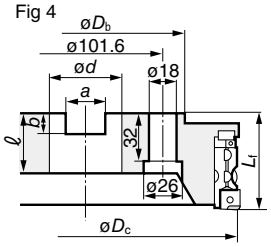
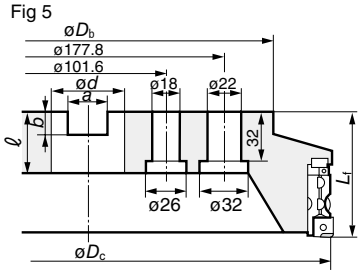


Fig 5



Body Imperial

Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Weight (kg)	Fig
		øDc	øD1	øDb	Lf	ød	a	b	ℓ			
FMU 4040ER	●	**37**	40	—	63	—	—	—	—	2	1.0	1
4050ER	●	**47**	50	—	63	—	—	—	—	3	1.2	1
4063ER	●	**60**	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	75	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

Fig 6

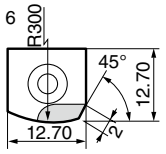
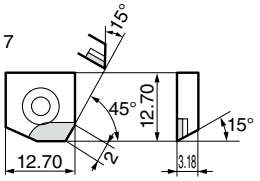


Fig 7



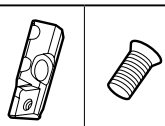
Grade		SUMIBORON	
Application	High Speed/Light	K	K
	General Purpose	K	K
	Roughing		

Cat. No	BN7000	BN700	Fig
SNEW1203ADTR	●	●	6
1203ADTR-S	●	●	7

* S denotes low cutting force insert.

Parts for Cartridge

Inserts are not included.





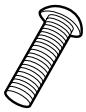
Cartridge	Screw	Adjustment Screw	O-ring	Spanner	Spanner	Recommended Tightening Torque (N·m)
FMUU(E)*	BFTX0509N	FMUJ	P3	TTX20	TH015	**5.0**

* FMU4040ER, FMU4050ER and FMU4063ERS use FMUUE type cartridges.
* FMUU and FMUUE are pre-assembled with screws and adjustment screws (with O-rings attached).

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - Optimum - Max.	Feed Rate f_z (mm/t) Min. - Optimum - Max.	Grade
K	Grey Cast Iron	250HB	800-**1400**-2000	0.10-**0.20**-0.30	BN7000(Dry)

Spare Parts

Button Head Cap Screw	Stopper Screw	Stopper	Double Screw	Spanner	Spanner	Spanner
				 (For Cartridges)	 (For Stopper Screws)	 (For Stoppers)
BH0620*	BTD0609	FMUE	WB5-10	TH040	LH030	LH025

* Button head cap screw for FMU4040ER, 4050ER and 4063ER is BH0615.
* Anti-seizure cream SUMI-P included in the package.

Setting Gauge

FMU-SET (Sold Separately)

RM Type

Rake Angle		
	Radial	−6° 45'
	Axial	−5° 45'

3mm 75°

P Steel	M Stainless Steel	K Cast Iron	N Non-ferrous Metal	N Aluminum	S Exotic Alloy	H Hardened Steel
×	×	◎	×	×	×	×

High Speed and High Efficiency Milling for Cast Iron

- **High Speed, High Efficiency Milling of Grey Cast Iron**
  - Utilising solid SUMIBORON BNS800 for high speed cutting of v_c = 1,500m/min.
  - High speed roughing of up to d=3.0mm.
  - Wiper insert for high speed finishing.
- **Low Cost**
  - Cost effective 8 cornered inserts.
  - Insert regrinding possible.
- **Simple Design for Insert Run-out**
  - Direct insert mounting design.
  - Insert run-out can be easily adjusted.

Fig 1

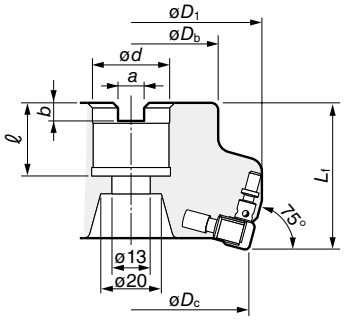
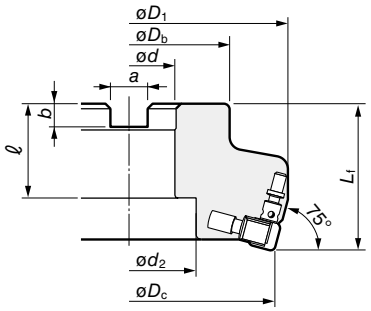


Fig 2



Body Imperial

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Max. Rotation	Weight (kg)	Fig
		øDc	øD1	øDb	ød2	Lf	ød	a	b	ℓ				
RM 3080R		**80**	90	60	—	50	**25.40**	9.5	6	25	6	9,000	1.6	1
RM 3100R		**100**	110	70	46	50	**31.75**	12.7	8	32	8	8,000	2.1	2
3125R		**125**	135	80	59	63	**38.10**	15.9	10	38	10	7,000	3.9	2
3160R		**160**	170	100	80	63	**50.80**	19.1	11	38	12	6,000	5.9	2

Inserts are not included.

Inserts

Fig 3

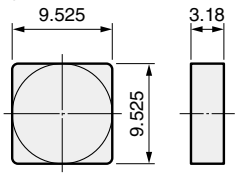
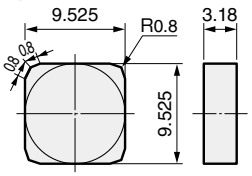
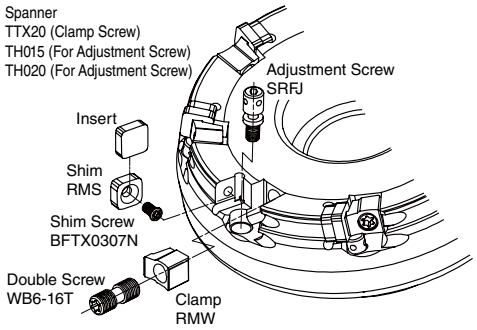


Fig 4 Surfing Insert



	Grade	SUMIBORON	
Application	High Speed/Light	K	
	General Purpose	K	
	Roughing	K	
Cat. No.		BNS800	Fig
SNGN 090308		●	3
090312		●	3
SNEN 090308W		●	4



Spare Parts

Clamp	Double Screw	Shim	Shim Screw
RMW	WB6-16T	RMS	BFTX0307N (N·m) 2.0
Adjustment Screw	Spanner (For Clamp)	Spanner (For Adjustment Screw)	Spanner (For Adjustment Screw)
SRFJ	TTX20	TH015	TH020

(N·m) Recommended Tightening Torque (N·m)

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min) Min. - **Optimum** - Max.	Feed Rate f_z(mm/t) Min. - **Optimum** - Max.	Grade
K	Grey Cast Iron	250HB	800- **1150** -1500	0.05- **0.13** -0.20	BNS800 (Dry)

Note The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth, and other factors.

⚠ CAUTION

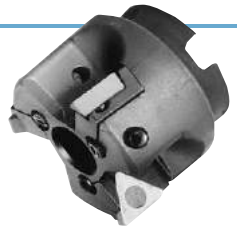
- Do not mix standard and wiper inserts on same cutter.
- Do not mix new and reground inserts on same cutter.
- Inserts can only be reground once (inscribed circle dimension must be at least 9.125mm)

For hardened steel machining use the SEC ACE Mill DNF Type.

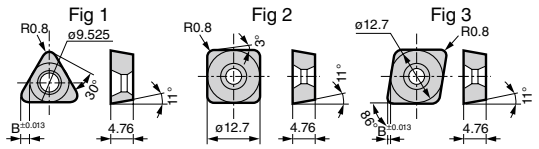
Milling Cutter Body…☞ Page H46 Insert…☞Page L96

SEC-Shell Endmill
PM Type

* Production of this cutter body is on a made-to-order basis only.

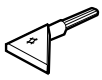


■ Inserts P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel (Unit: mm)



Grade		Cermet	Carbide			
Application	High Speed/Light					
	General Purpose	P	P	K		
	Roughing					
Cat. No.		T250A	A30N	G10E	Fig	Applicable Endmill
TPKA 33TR		▲	▲		1	PM 50T
33R				▲	1	PM 60T
SPKA 43TR		—	▲		2	PM 50S
43R		—		▲	2	PM 60S
MPKA 43TR		—	▲		3	PM 50M
43R		—		▲	3	PM 60M

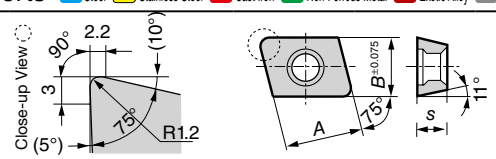
■ Spare Parts

Locator	Pin	Clamping Bolt	Locator Screw	Washer	Spanner
					
LPMTR LPMSR LPMMR	SR134B	BTD0508	BH0304	PW30	TH025

SEC-Multi Use Endmill
HKE Type

* Production of this cutter body is on a made-to-order basis only.

■ Inserts P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel



Grade		Coated Carbide	Carbide				
Application	High Speed/Light						
	General Purpose	PM	P				
	Roughing	PM					
Cat. No.		ACP200	A30N	Dimensions (mm) A	B	s	Applicable Endmill
EPMW 433T			●	12.70	9.525	4.76	HKE1025
433			●	12.70	9.525	4.76	HKE2030
543T			●	15.875	12.70	6.35	HKE2040
543			●	15.875	12.70	6.35	HKE2050

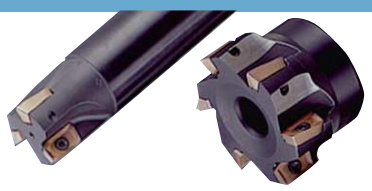
■ Spare Parts

Parts Screw		Spanner	Applicable Endmill
	N·m		
BFTX0409N	3.0	TRX15	HKE1025,HKE2030
BFTX0511N	5.0	TRX20	HKE1040,HKE2050

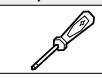
N·m Recommended Tightening Torque (N·m)

SEC-Shell Endmill
WEM Type

* Production of this cutter body is on a made-to-order basis only.

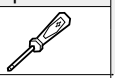


■ Spare Parts (WEM 2000E/E-C/EL/EL-C Type)

Screw		Spanner	Applicable Endmill Diameter (øD)
	N·m		
BFTX02505N	1.5	TRD08	ø18mm or less
BFTX02506N	1.5		ø20mm or more

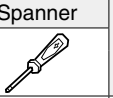
N·m Recommended Tightening Torque (N·m)

■ Spare Parts (WEM 2000F Type)

Screw		Spanner	Applicable Endmill
	N·m		
BFTX02506N	1.5	TRD08	WEM2000F

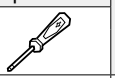
N·m Recommended Tightening Torque (N·m)

■ Spare Parts (WEM 3000E/E-C/EL/EL-C/EXLH/EXLH-C Type)

Screw		Spanner	Applicable Endmill
	N·m		
BFTX03584	3.0	TRD15	WEM3000E/EL
BFTX03588	3.0		WEM3000E-C

N·m Recommended Tightening Torque (N·m)

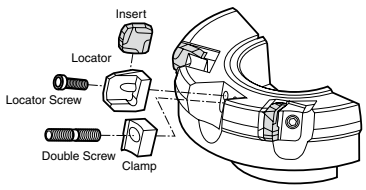
■ Spare Parts (WEM 3000F/F-C Type)

Screw		Spanner	Applicable Endmill
	N·m		
BFTX03584	3.0	TRD15	WEM3000F
BFTX03588	3.0		WEM3000F-C

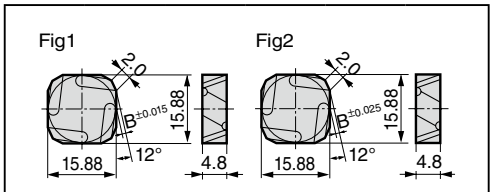
N·m Recommended Tightening Torque (N·m)

PGM5000 Type

* Production of this cutter body is on a made-to-order basis only.



■ Inserts



Grade		Carbide					
Application	High Speed/Light						
	General Purpose	P	K	K			
	Roughing						
Cat. No.		A30N	H10E	G10E			Fig
CSP53R		●	●	●			1
53L		●					1
CSPH53R		●					2
53L							2

* EH20Z (Coated Carbide) grade can also be produced.

■ Spare Parts

Applicable Cutters	Locator	Clamp	Double Screw	Locator Screw	Spanner
PGM5080R to PGM5315R	PGMKR	PGMWR	WB8-20	FBH0512	TH030 TH040
PGM5080L to PGM5315L	PGMKL	PGMWL			

▲mark : To be replaced by new item (Please confirm stock availability)

Inserts and Parts for Discontinued Series

SEC-Metal Slash Mill

MS 1400 Type

*Production of this cutter body is on a made-to-order basis only.

■ Inserts

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

Grade		Coated Carbide						
Application	High Speed/Light	P			K		P	
	General Purpose		PM	PM	K			
	Roughing		PM	PM		K		
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	CS3000	Fig
SDMW 1406ZDTR		▲	▲		▲	▲	▲	1
SDEW 1406ZDTR		▲	▲		▲	▲	▲	2

Fig 1

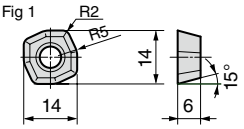
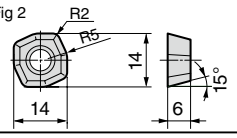
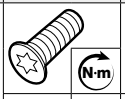
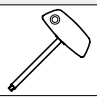
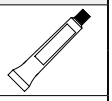


Fig 2



■ Spare Parts

Applicable Cutters	Insert Screw	Spanner	Anti-seize Cream
MS 1400 Type			
	BFTX0513N 5.0	TRT820	SUMI-P

N·m Recommended Tightening Torque (N·m)

SEC-Linear Mills

PF 5000 Type

*Production of this cutter body is on a made-to-order basis only.

■ Inserts

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

Grade		Cermet			Carbide			Ceramic			
Application	High Speed/Light	P	P		K			K			
	General Purpose										
	Roughing										
Cat. No.		T1500A	T1200A		H10E			NB90M			Fig
SNEN 535W		▲	▲								3
SNEF 53W					●						4
53WT		▲	▲								4

Fig 3

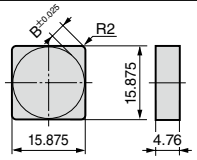
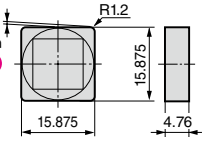


Fig 4 Wiper Insert



* W, WT: Wiper edge

■ Spare Parts

Applicable Cutters	Clamp	Double Screw	Seat	Adjusting Clamp	Slide Pin	Spring	Button Head Screw	Spanner
PF5100 ~ PF5250	PFC	WB6-20	PFB	PFW	PFP	PFS	BH0408	TH030

▲ mark : To be replaced by new item (Please confirm stock availability)

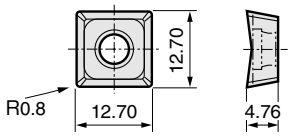
SEC-WaveMills

WFM 4000E/E-C Type

*Production of this cutter body is on a made-to-order basis only.

Inserts

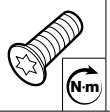
P Steel M Stainless Steel K Cast Iron N Non-Ferrous Metal S Exotic Alloy H Hardened Steel



Grade		Coated Carbide					Carbide		Cermet
Application	High Speed/Light	P			K				
	General Purpose		PM	PM	K		P	K	P
	Roughing		PM	PM		K			
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	A30N	G10E	T250A
XDMT 120408PDEN-G		▲	▲	▲	▲	▲			
120408PDER-S			▲	▲		▲			
120408PDEN-H			▲	▲		▲			
120408PDEN							▲	▲	▲

-G: General purpose, -S: Sharp edge, -H: Strong edge

Spare Parts

Screw		Seat	Set Screw	Spanner	Spanner	Applicable Endmills
						
BFTX0409N	3.0	—	—	TRD15	—	WFM4040E
BFTX0414	3.0	WFMS4R	BT0506	TRD15	LH025	WFM4050E
BFTX0414	3.0	WFMS4R	BT0506	TRD15	LH025	WFM4063E-C
BFTX0414	3.0	WFMS4R	BT0506	TRD15	LH025	WFM4063E
BFTX0414	3.0	WFMS4R	BT0506	TRD15	LH025	WFM4080E

N·m Recommended Tightening Torque (N·m)

Anti-seizure cream SUMI-P included in the package.

SEC-WaveMills

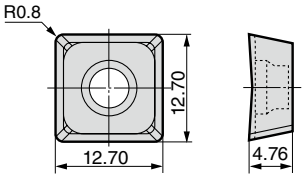
WFM4000/WFMF4000 Type

*Production of this cutter body is on a made-to-order basis only.

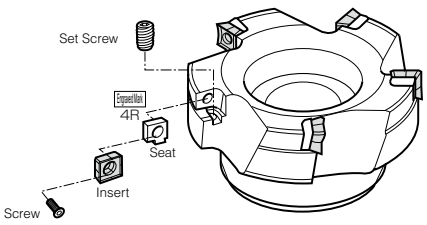
Inserts

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

Grade		Coated Carbide								Carbide			Cermet		
Application	High Speed/Light	P			K										
	General Purpose		PM	PM	K					P	K		P		
	Roughing		PM	PM		K									
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300				A30N	G10E		T250A		
XDMT 120408PDEN										▲	▲		▲		
120408PDER-S			▲	▲		▲									
120408PDEN-H			▲	▲		▲									
120408PDEN-G		▲	▲	▲	▲	▲									



-S: Sharp edge, -H: Strong edge, -G: General purpose



Spare Parts

Applicable Cutters	Seat	Screw	N·m	Set Screw	Spanner	Spanner
WFM(F) 4000R	WFMS4R	BFTX 0414	3.0	BT0506	TRD15	TH025
WFM(F) 4000L	WFMS4L					

N·m Recommended Tightening Torque (N·m)

Inserts and Parts for Discontinued Series

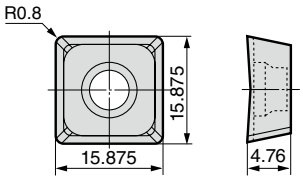
SEC-WaveMills
WFM5000/WFMF5000 Type

*Production of this cutter body is on a made-to-order basis only.

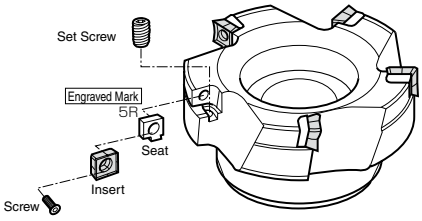
Inserts

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

Grade		Coated Carbide								Carbide			Cermet		
Application	High Speed/Light	P			K										
	General Purpose		PM	PM	K					P	K		P		
	Roughing		PM	PM		K									
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300				A30N	G10E		T250A		
XDMT 150408PDEN										▲	▲		▲		
150408PDEN-H			▲	▲		▲									
150408PDEN-G		▲	▲	▲	▲	▲									



-G: General purpose, -H: Strong edge



Spare Parts

Applicable Cutters	Seat	Screw	(N·m)	Set Screw	Spanner	Spanner
WFM(F) 5000R	WFMS5R	BFTX 0515N	5.0	BT0506	TRD20	TH025
WFM(F) 5000L	WFMS5L					

(N·m) Recommended Tightening Torque (N·m)

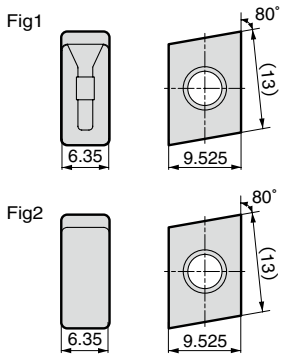
SEC-Shoulder Milling Cutters
CNP(F)13000 Type

*Production of this cutter body is on a made-to-order basis only.

Inserts

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

Grade		Coated Carbide															
Application	High Speed/Light	P			K												
	General Purpose		PM	PM	K												
	Roughing		PM	PM		K											
Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300											Fig
CNMU 130608N-G			▲	▲	▲	▲											1
130608N-H			▲	▲	▲	▲											1
CNMQ 130608N						▲											2
130616N						▲											2
130608N						▲											2



-G: General purpose, -H: Strong edge

Spare Parts

Applicable Cutters	Screw	Spanner	Anti-seizure Cream
CNP(F)13000	(N·m)		
	BFTX0412N 3.0	TTX15W	SUMI-P

(N·m) Recommended Tightening Torque (N·m)

SIDE-CUTTER CONFIGURATIONS

Possible Side-Cutter Sizes

Grooving Width w (mm)	16 to 24
Cutter Diameter øD_c (mm)	Above ø80

* These are made-to-order, please consult our sales representatives for more information

▲mark : To be replaced by new item (Please confirm stock availability)