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Milling Cutters

(Indexable Endmills) H1 to H124

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Milling Cutters
(Special Purpose)...H133

Stock Indications and Symbols

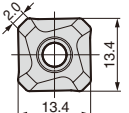
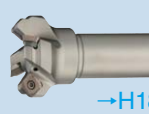
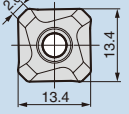
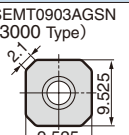
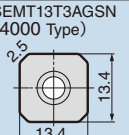
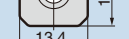
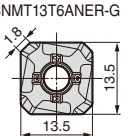
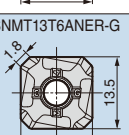
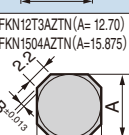
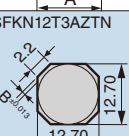
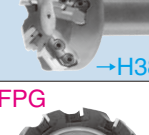
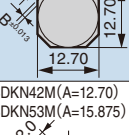
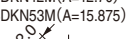
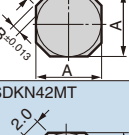
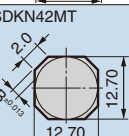
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- mark: To be replaced by a new item featured on the same page
- ▲ mark: To be replaced by new item
(Please confirm stock availability)

- * 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

H1

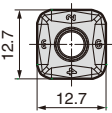
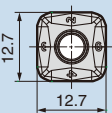
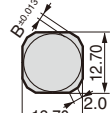
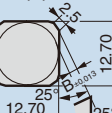
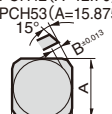
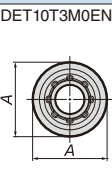
Milling Cutter/Indexable Endmill Selection Guide

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

Application Type	Cutting Edge 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				
																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		
				Ref. Page			Axial Radial	General Purpose Finishing High Feed																	
Face Milling		ø40 to ø250	-	WGX  →H18	WGX13000R(S) WGXM13000R(S) WGXF13000R(S)	SEMT13T3AGSR-G 	20° to 22° -20° to -24°	◎									◎	◎	◎	◎	◎	◎		H18	
		ø32 to ø63	ø32	WGX-EW  →H18	WGX13000EW	SEMT13T3AGSR-G 	20° to 22° -20° to -24°	◎									◎	◎	◎	◎	◎	◎		H18	
		ø32 to ø100	-	WGC  →H26	WGC3000 WGC3000RS	SEMT0903AGSN (3000 Type) 	20° -10° to -19°	◎									◎	◎	◎	◎	◎	◎		H26	
		ø40 to ø200	-		WGC(F)4000 WGC(F)4000RS	SEMT0903AGSN (3000 Type) 	20° to 22° -20° to -24°	◎										◎	◎	◎	◎	◎	◎		
		ø20 to ø63	ø20 to ø32	WGC-EW  →H27	WGC3000EW	SEMT13T3AGSN (4000 Type) 	20° -10° to -19°	◎										◎	◎	◎	◎	◎	◎		H27
		ø32 to ø63	ø32		WGC4000EW	SEMT13T3AGSN (4000 Type) 	20° to 22° -20° to -24°	◎										◎	◎	◎	◎	◎	◎		
		ø40 to ø250	-	DGC  →H28	DGC13000R(S) DGC13000R(S) DGC13000R(S)	SNMT13T6ANER-G 	-5° -10°	◎										◎	◎	◎	◎	◎	◎		H28
		ø40 to ø63	ø32	DGC-EW  →H28	DGC13000EW	SNMT13T6ANER-G 	-5° -10°	◎										◎	◎	◎	◎	◎	◎		H28
																									
		ø80 to ø250	-	UFO  →H36	UFO4000	SFKN12T3AZTN (A=12.70) SFKN1504AZTN (A=15.875) 	27° -7°	○										○	○	○	○	○	○		H36
		ø100 to ø250	-		UFO5000	SFKN12T3AZTN (A=12.70) SFKN1504AZTN (A=15.875) 	27° -7°	○											○	○	○	○	○	○	
		ø50 to ø80	ø32 to ø42	UFO-E  →H38	UFO4000E	SFKN12T3AZTN 	27° -7°	○										○	○	○	○	○	○		H38
		ø80 to ø315	-	FPG  →H39	FPG4000	SDKN42M (A=12.70) SDKN53M (A=15.875) 	15° -4°	○										○	○	○	○	○	○		H39
		ø100 to ø200	-		FPG5000	SDKN42M (A=12.70) SDKN53M (A=15.875) 	15° -4°	○											○	○	○	○	○	○	
		ø50 to ø80	ø32 to ø42	FPE  →H40	FPE4000	SDKN42MT 	15° -3°	○										○	○	○	○	○	○		H40
	ø80 to ø200	-	EHG  →H41	EHG4000	SEKN42MT (A=12.70) SEKN53MT (A=15.875) 	20° -3°	○										○	○	○	○	○	○		H41	
	ø(80) to ø(200)	-		EHG5000	SEKN42MT (A=12.70) SEKN53MT (A=15.875) 	20° -3°	○											○	○	○	○	○	○		

Milling Cutter/Indexable Endmill Selection Guide

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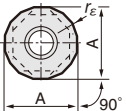
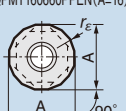
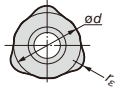
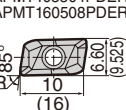
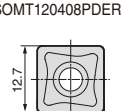
Application Type	Cutting Edge Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle		Application											Work Material						Ref. Page
									Face Milling	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	P	M	K	N	S	H				
																	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	
Face Milling		ø80 to ø250	-	DNX  →H42	DNX12000 DNXF12000	SNMT1205ZNEN 	-5°	-6°	○									○		◎					H42	
	 	ø80 to ø160	-	DNH(S)  →H42	DNH12000 DNHS12000	SNMT1205ZNEN 	-5°	-6°		○							○		◎					H42		
		ø80 to ø200	-	DNF  →H46	DNF4000	CSNH43M 	-5°	-6°	○			○					○		◎	×	×	×		H46		
		ø80 to ø315	-	APG  →H47	APG4000	SDC(H)42TR 	18°	-2°	○			○					○	○	○	◎	◎		×	H47		
	 	ø80 to ø200 ø100 to ø315	-	DPG  →H48	DPG4000 DPGF4000 DPG5000	SPCH42 (A=12.70) SPCH53 (A=15.875) 	8°	0°		○							○	○	○	○	○			H48		
		ø80 to ø160	-	GRC  →H50	GRC6000	RGEN2004SN-S 	25°	10°	○			○						○	○	◎	◎		◎	○	H50	
Radius Milling		ø12 to ø20	ø10 to ø25	BRC-ES  →H51, L118	BRC-ES	RDHX0701M0T 	0°	0°		◎							×	×	×	◎ (FC)			◎	H51 L118		
		ø42 to ø66	-	BRC-R  →H51, L118	BRC-R	RDHX1003M0T 	0°	0°		◎							×	×	×	◎ (FC)			◎	H51 L118		
	  	ø40 to ø52 ø40 to ø100 ø63 to ø160	-	RSX  →H52	RSX10000 RSXF10000 RSX12000 RSXF12000 RSX16000 RSXF16000	RDET10T3M0EN 	10°	-5°																H52		
	 	ø25 to ø32 ø32	ø25 to ø32 ø32	RSX-ES  →H52	RSX10000ES RSXF10000ES RSX12000ES RSXF12000ES	RDET10T3M0EN 	10°	-5°		◎									◎			◎		H52		

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Milling Cutters

Face Milling
Radius
Multi-Purpose
Shoulder Milling
R/Copying
Groove/T-Slot
Chamfering
Aluminium/Light Alloys
High-Speed Cast Iron

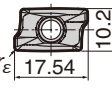
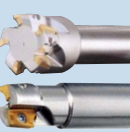
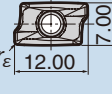
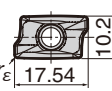
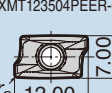
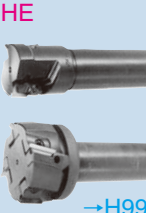
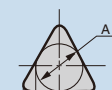
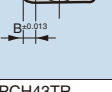
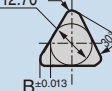
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Application Type	Cutting Edge Angle and Max. Depth of Cut (mm)	Diameter (mm)	Shank Diameter (mm)	Description	Series	Insert Cat. No. and Diagram	Rake Angle		Application											Work Material						Ref. Page			
									Face Milling							Shoulder Milling				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	
							Axial	Radial	General Purpose	Finishing	High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	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		ø40 to ø80	-	 →H59	WRCX12000 WRCXF12000	QPMT120440PPEN (A=12) QPMT160660PPEN (A=16) QPMT200670PPEN (A=20)	-3°	0°	◎					○	◎	◎				◎	◎	◎				○	○	H59	
		ø63 to ø100	-		WRCX16000 WRCXF16000		-3°	0°	◎					○	◎	◎				◎	◎	◎		◎		○	○	H59	
		ø125 to ø160	-		WRCX20000		-3°	0°	◎					○	◎	◎				◎	◎	◎				○	○	H59	
		ø20 to ø25	ø20 to ø25	 →H59	WRCX08000E	QPMT080330PPEN (A=8) QPMT107335PPEN (A=10) QPMT160660PPEN (A=16)	-3°	0°											◎	◎	◎	◎				○	○	H59	
		ø25 to ø32	ø25 to ø32		WRCX10000E		-3°	0°	◎					○	◎	◎				◎	◎	◎	◎		◎		○	○	H59
		ø40 to ø50	ø32		WRCX16000E		-3°	0°																					
Multi-functional Milling		ø40 to ø100	-	 →H64	MSX08000R MSX12000R MSX14000R	WDMT060330ZDTR (d=6.35) WDMT080440ZDTR (d=8.5) WDMT120440ZDTR (d=12) WDMT140660ZDTR (d=14)	8°	-3° to -8°			◎				○	○				◎	◎	◎	◎				○	H64	
		ø16 to ø63	ø16 to ø42		MSX06000E MSX08000E MSX12000E		8°	-3° to -8°				◎				○	○				◎	◎	◎	◎				○	H64
		ø20 to ø30	ø20 to ø25		WMM2000E/EL WMM2000ELH	APMT103504PDER APMT160508PDER	7° to 11°	15° to 16°	◎						◎	◎	◎	◎				◎	◎	◎	◎				H68
		ø32 to ø40	ø32	 →H68	WMM3000E/EL WMM3000ELH		7° to 11°	17° to 19°																					
Semi-Shoulder Milling		ø80 to ø200	-		 →H70	PWC4000 PWCF4000	LNMX160608PNSN-G	-5°	-15°	○			◎	○	○							◎							H70
		ø80 to ø250	-			PWS4000 PWSF4000	LNMX170808PNSR-G	-6°	-15°	○				◎	◎	○						◎	○	○	○				
Shoulder Milling		ø40 to ø100	-	 →H74	WFX08000R (S) WFXM08000R (S) WFXF08000R (S)	SOMT080304PZER	12°	-6°												◎	◎	◎	◎				○	H74	
		ø50 to ø250	-		WFX12000R (S) WFXF12000R (S)		8°	-8°						◎	○														
		ø20 to ø63	ø16 to ø32		WFX08000E WFXM08000E	SOMT120408PDER	12°	-6°													◎	◎	◎	◎				○	H74
		ø40 to ø80	ø32	 →H74	WFX12000E WFXF12000E		8°	-8°						◎	○														

Milling Cutter/Indexable Endmill Selection Guide

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

Application Type	Cutting Edge 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	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
									General Purpose	Finishing																
Shoulder Milling																										
	ø40 to ø63	-	 →H84	WEX2000F	(3000 Type) AXMT170508PEER-G	23° to 25°	16° to 18°																			H84
		ø40 to ø125		-	WEX3000F WEX3000R WEXF3000R	 r _ε 17.54	19° to 24°	12° to 15°																		
	ø14 to ø63	ø16 to ø32	 →H84	WEX2000E WEX2000EL	(2000 Type) AXMT123504PEER-G	14° to 25°	10° to 18°	○		◎	◎	◎				◎	◎	◎	◎	◎	◎	◎			H92	
		ø25 to ø63		ø20 to ø42	WEX3000E(-C) WEX3000ES(-C) WEX3000EL	 r _ε 12.00	16° to 24°	8° to 5°																		
	ø40 to ø50	-	 →H92	WRX2000R	(3000 Type) AXMT170508PEER-G	24° to 22°	16° to 17°	○		◎	◎	◎				◎	◎	◎	◎	◎	◎	◎			H92	
		ø50 to ø100		-	WRX3000R	 r _ε 17.54	22° to 24°	13° to 15°																		
	ø20 to ø40	ø20 to ø42	 →H92	WRX2000E	(2000 Type) AXMT123504PEER-G	16° to 20°	13° to 16°	○		◎	◎	◎				◎	◎	◎	◎	◎	◎	◎			H98	
		ø40 to ø50		ø32 to ø42	WRX3000E	 r _ε 12.00	20° to 22°	12° to 13°																		
	ø80 to ø200	-	 →H98	CHG4000	TEKN43TR	15°	4°			○	○					◎	○	○	○	◎					H99	
	ø16 to ø28	ø16 to ø25	 →H99	CHE2000	TECN22R(A=6.35) TECN32R(A=9.525) TEEN43R(A=12.70)	6° to 15°	-3° to 0°									○	○	○	○	○	○					
	ø30 to ø40	ø32		CHE3000	 B _ε 0.013	15°	-3° to 0°			○	○															
	ø50 to ø80	ø32 to ø42		CHE4000	 B _ε 0.013	15°	2° to 4°																			
	ø80 to ø200	-	 →H101	CPG4000	TPCH43TR	6°	0°			○	○					○	○	○	○						H102	
	ø16 to ø60	ø16 to ø42	FMS	TPCH43TR	 B _ε 0.013	3° to 7°	-4° to -6°			○	○					○	○	○	○							
	R10 (ø20) to R25 (ø50)	ø25 to ø50.8	 →H103	WBMR2000 WBMR2000L	ZNMT1804100-C	-10°	—					◎	◎			◎	◎	◎	◎			○	○		H103	
		R5 (ø10) to R15 (ø30)		ø16 to ø32	WBMF1000	ZPGU1551050	0°	—					◎	◎			◎	◎	◎	◎			○			

H

Milling Cutters

Face Milling

Radius

Multi-Purpose

Shoulder Milling

R/Copying

Groove/T-Slot

Chamfering

Aluminium/Light Alloys

High-Speed Cast Iron

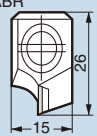
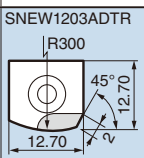
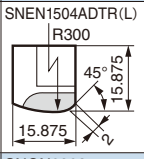
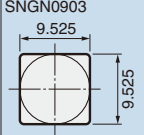
Milling Cutter/Indexable Endmill Selection Guide

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

Application Type	Cutting Edge 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			
																				P	M	K	N	S		H		
									Face Milling	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	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				
Axial	Radial	General Purpose	Finishing	High Feed																								
Radius Milling, 3D Profiling		R8 (ø16) to R25 (ø50)	ø20 to ø50	BES	BES	BEST160S(L) 	0°	0°																				
Groove Milling		ø100 to ø160	-	TSM	TSM	SNHG121 	-2°	-12°																				
T Slot		ø21 to ø50	ø25 to ø32	TSE	TSE	CPMT060204N-US 	0°	0°																				
Chamfering		ø8 to ø32	ø14 to ø20	SCP	SCP	SDMA322 	0°	0°																				
		ø7 to ø35	ø32	SMC	SMC	SPMN422 	0°	0°																				
Milling of Non-Ferrous Metal		ø80 to ø125	-	HF	HFM12000 HFF12000	NF-LDEN12T3ZDFR 																						
		ø80 to ø200	-	RF	RF4000	NF-SNEW1204ADFR 	10°	4°																				
		ø30 to ø63	ø20	SRF	SRF	NF-SNEW09T3ADTR 	6°	-2° to 4°																				
		ø50 to ø125	-	WAX	WAX3000	(3000 Type) AECT160404PEFRA 	19° to 25°	6°																				
		ø125 to ø200	-	WAX	WAX4000	(4000 Type) AECT220604PEFRA 	19° to 25°	6°																				
		ø20 to ø40	ø20 to ø32	WAX-E	WAX3000E WAX3000EL	(4000 Type) AECT220604PEFRA 	19° to 25°	6°																				
	ø25 to ø40	ø25 to ø32	WAX-E	WAX4000E WAX4000EL	(4000 Type) AECT220604PEFRA 	19° to 25°	6°																					

Milling Cutter/Indexable Endmill Selection Guide

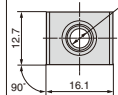
◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Cutting Edge 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				
																	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		
Milling of Non-Ferrous Metal		ø80 to ø200	-	 →M34	FAM		13°	4°	○	○								×	×	×	×	○	○		×	M34
		ø80 to ø100	-	 →M34	SAM		10°	6°	○	○		○						×	×	×	×	○	○		×	M34
		ø50 to ø80	ø32	 →M35	SAM-E		10°	0° to 2°	○	○		○							×	×	×	×	○	○		×
High Speed Milling of Cast Iron		ø37 to ø200	-	 →H119, L114	FMU FMU-E		8°	2°		◎								×	×	×	◎ (FC)	×	×	×	×	H119 L114
		ø80 to ø160	-	 →L116	FM FMF		8°	2°		◎								×	×	×	◎ (FC)	×	×	×	×	L116
		ø80 to ø160	-	 →H120, L113	RM		-5° 45'	-6° 45'	○	◎									×	×	×	◎ (FC)	×	×	×	×

Milling Cutter (Special Purpose) Selection Guide

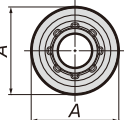
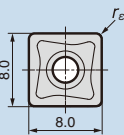
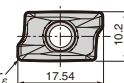
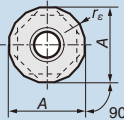
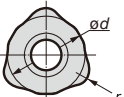
◎: Best ○: Good ✕: Unsuitable Blank: Not recommended

Application Type	Cutting Edge 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
																			P	M	K	N	S	H	
							Axial	Radial	General Purpose	Face Milling	High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	General Steel/Carbon Steel/Alloy Steel	Tempered Steel/Die Steel	Stainless Steel	Cast Iron/Ductile Cast Iron	Non-Ferrous Metal	Aluminium Alloy	

High Feed Cutting		ø80 to ø315	-	 →H134	GRV16000		-5°	-14° to -6°																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</
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Modular Tool Selection Guide

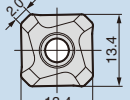
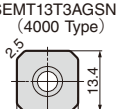
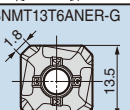
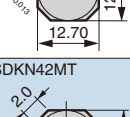
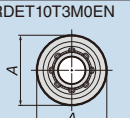
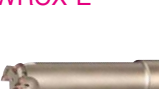
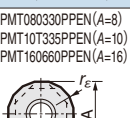
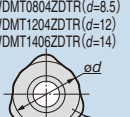
◎: Best ○: Good ×: Unsuitable Blank: Not recommended

Application Type	Cutting edge 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					
																			P	M	K	N	S		H				
									Face Milling	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	General Steel/Carbon Steel/Alloy Steel	Tempered Steel/De Steel	Stainless Steel	Cast Iron/Ductile Cast Iron	Non-Ferrous Metal	Aluminium Alloy	Ti Alloy/Heat Resistant Alloy		Hardened Steel 45 to 55 HRC				
				Ref. Page			Axial	Radial	General Purpose	Finishing	High Feed																		
Radius Milling		ø25 to ø32	ø23 to ø32	 →H128	RSX10000M		10°	-5° to -8°	⊙																				
		ø32 to ø40	ø28 to ø32		RSXF10000M																								
					RSX12000M																								
					RSXF12000M																								
Shoulder Milling		ø20 to ø40	ø18 to ø32	 →H129	WFX08000M		12°	-6°	○																				
Shoulder Milling		ø16 to ø40	ø15 to ø32	 →H130	WEX2000M		14° to 25°	10° to 18°	○																				
		ø25 to ø40	ø23 to ø32		WEX3000M																								
Radius Milling		ø20 to ø25	ø18 to ø25	 →H131	WRCX08000M		-3°	0°	⊙																				
		ø25 to ø32	ø23 to ø32		WRCX10000M																								
		ø40	ø28 to ø32		WRCX12000M																								
Multi-functional Milling		ø16 to ø25	ø15 to ø25	 →H132	MSX06000M		8°	-3° to -8°	⊙																				
		ø25 to ø35	ø23 to ø32		MSX08000M																								
		ø32 to ø40	ø28 to ø32		MSX12000M																								

(*) Shank diameters in the above table are the sizes of corresponding arbors.
Refer to H127 for details.

Indexable Endmill Selection Guide

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

Application Type	Cutting Edge 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			
																	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	 	ø32 to ø63	ø32	WGX-EW  →H18	WGX13000EW	SEMT13T3AG SR-G 	20° to 22°	-20° to -24°	◎								◎	◎	○	○					H18
	 	ø20 to ø63	ø20 to ø32	WGC-EW  →H27	WGC3000EW WGC4000EW	SEMT13T3AGSN (4000 Type) 	20°	-10° to -19°	◎								◎	◎	◎	◎	◎	◎	◎		H27
	 	ø40 to ø63	ø32	DGC-EW  →H28	DGC13000EW	SNMT13T6ANER-G 	-5°	-10°	◎								◎	◎	○	○					H28
		ø50 to ø80	ø32 to ø42	UFO-E  →H38	UFO4000E	SFKN12T3AZTN 	27°	-7°	○								○	○	○	○	○	○	○		H38
		ø50 to ø80	ø32 to ø42	FPE  →H40	FPE4000	SDKN42MT 	15°	-3°	○									○	○	○		○			H40
	Radius Milling		ø12 to ø20	ø10 to ø25	BRC-ES  →H51	BRC-ES	RDHX0701MOT 	0°	0°	◎								×	×	×	◎ (FC)			◎	
 		ø25 to ø32	ø25 to ø32	RSX-ES  →H52	RSX10000ES RSXF10000ES RSX12000ES RSXF12000ES	RDET10T3M0EN 	10°	-5°	◎										◎			◎		H52	
  		ø20 to ø25	ø20 to ø32	WRCX-E  →H59	WRCX08000E WRCX10000E WRCX16000E	QPMT080330PPEN (A=8) QPMT10T335PPEN (A=10) QPMT160660PPEN (A=16) 	-3°	0°									◎	◎	◎	◎	◎	○	○	H59	
		ø25 to ø32	ø25 to ø32				-3°	0°	◎									◎	◎	◎	◎	◎	○	○	
		ø40 to ø50	ø32				-3°	0°																	
Multi-functional Milling			ø16 to ø63	ø16 to ø42	MSX-E  →H64	MSX06000E MSX08000E MSX12000E	WDMT0603ZDTR (d=6.35) WDMT0804ZDTR (d=8.5) WDMT1204ZDTR (d=12) WDMT1406ZDTR (d=14) 	8°	-3° to -8°									◎	◎	◎	◎			○	H64
	 	ø20 to ø30	ø20 to ø25	WMM  →H68	WMM2000E/EL WMM2000ELH WMM3000E/EL WMM3000ELH	APMT103504PDER APMT160508PDER 	7° to 11°	15° to 16°	◎								◎	◎	◎	◎	◎	◎	◎		H68
		ø32 to ø40	ø32				7° to 11°	17° to 19°																	
Shoulder Milling	 	ø20 to ø63	ø16 to ø32	WFX-E  →H74	WFX08000E WFXM08000E WFX12000E WFXF12000E	SOMT120408PDER 	12°	-6°	○									◎	◎	◎	◎	◎			H74
		ø40 to ø80	ø32				8°	-8°																	

Indexable Endmill Selection Guide

⊙: Best ○: Good ✕: Unsuitable Blank: Not recommended

[illegible]

H Milling Cutters

- Face Milling
- Radius
- Multi-Purpose
- Shoulder Milling
- R/Copying
- Groove/T-Slot
- Chamfering
- Aluminium/Light Alloys
- High-Speed Cast Iron

Explanation of Milling Grades

Selection of Sumitomo Grades (Milling)

Application	P General Steel (Carbon Steel, Alloy Steel), Soft Steel						M Stainless Steel						K Cast Iron				
	High Speed Cutting	Finishing to Light Cutting		Medium Cut	Rough to Heavy Cutting		High Speed Cutting	Finishing to Light Cutting		Medium Cut	Rough to Heavy Cutting		High Speed Cutting	Finishing	Medium Cut		
	Wear Resistance			Fracture Resistance			Wear Resistance			Fracture Resistance			Wear Resistance			Fracture Resistance	
ISO Classification	—	P01	P10	P20	P30	P40	—	M01	M10	M20	M30	M40	—	K01	K10	K20	K30
Coated Carbide																	
Cermet																	
Carbide																	
Ceramic																	
Uncoated CBN																	

Application	S Exotic Alloy						H Hardened steel					N Non-Ferrous Metal								
	High Speed Cutting		Finishing to Light Cutting		Medium Cut		High Speed Cutting		Finishing		Medium Cut			High Speed Cutting		Finishing		Medium Cut		
	Wear Resistance			Fracture Resistance			Wear Resistance			Fracture Resistance			Wear Resistance			Fracture Resistance				
ISO Classification	—	S01	S10	S20	S30	S40	—	H01	H10	H20	H30	—	N01	N10	N20	N30				
Coated Carbide 																				
																				
																				
																				
Carbide 																				
Uncoated CBN 																				
																				
PCD 																				

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

Milling Cutters

Face Milling
 Radius
 Multi-Purpose
 Shoulder Milling
 R/Copying
 Groove/T-Slot
 Chamfering
 Aluminium/Light Alloys
 High-Speed Cast Iron

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	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 Coat.	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	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 Coat.	ACZ310
	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 Coat.	—
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.



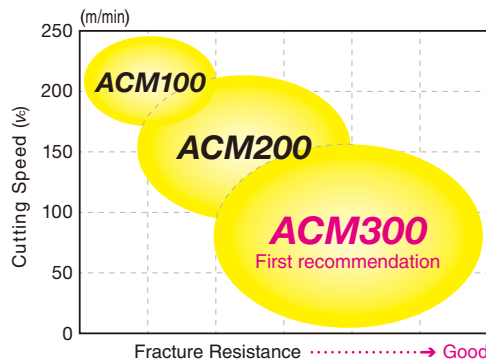
Polycrystalline Diamond

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 Coat.

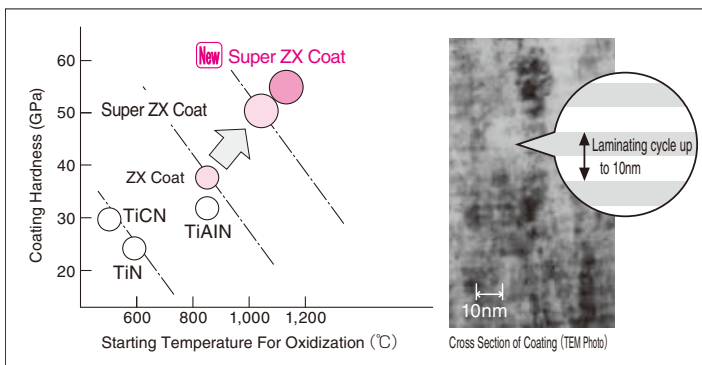
New ACM200

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 Coat.

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 New Super ZX Coat.

Characteristics



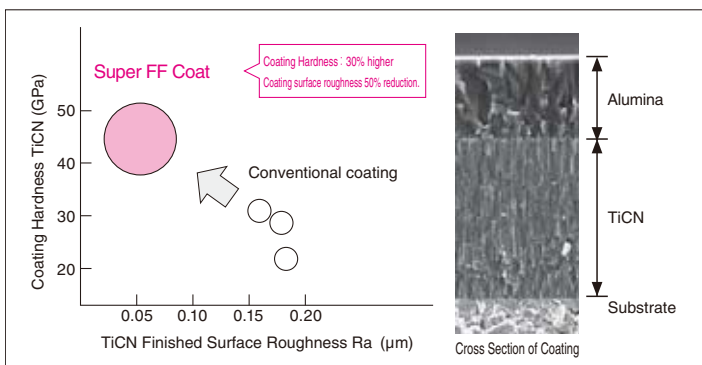
NEW Super ZX Coat (PVD : Physical Vapor Deposition)

ACM100 / ACM300

Compared to conventional PVD grades, the coating hardness has been increased by 40% and the oxidation 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 : Chemical Vapor Deposition)

ACM200

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

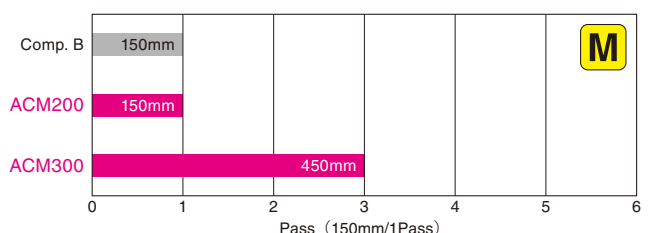
High speed, high efficiency machining of more than 1.5 times that of conventional grades is possible by refining and hardening the coating layer.

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 : $v_c=150\text{m/min}$, $f_z=0.15\text{mm/t}$, $a_p=1.0\text{mm}$, $a_e=60.0\text{mm}$, Wet



Work Material : SUS316L Tool : **WEX3032E (AXMT170508PEER-E)**
Cutting Conditions : $v_c=150\text{m/min}$, $f_z=0.15\text{mm/t}$, $a_p=2.0\text{mm}$, $a_e=20.0\text{mm}$, 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 steel 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.

● Application Range

		P General Steel (Carbon Steel, Alloy Steel), Soft Steel					
Cutting State	High		Finishing to Light		Medium	Rough to Heavy	
	Wear Resistance ← Fracture Resistance						
JIS ISO Classification	—	P01	P10	P20	P30	P40	
Grade					T4500A		
			T250A				

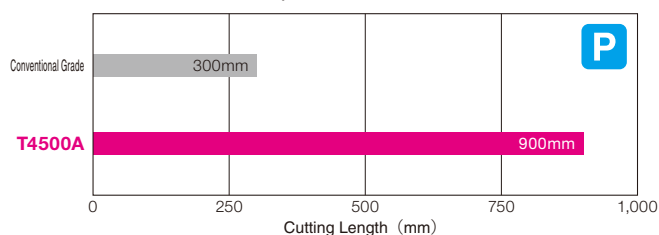
● Recommended Cutting Conditions

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.

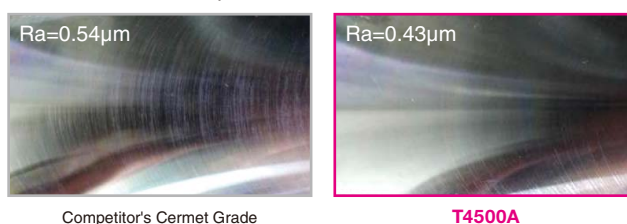
Performance

● 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



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

(SEC-) Cutter Identification Table

STANDARD TYPE

DGC (F) 13 100 R (S)

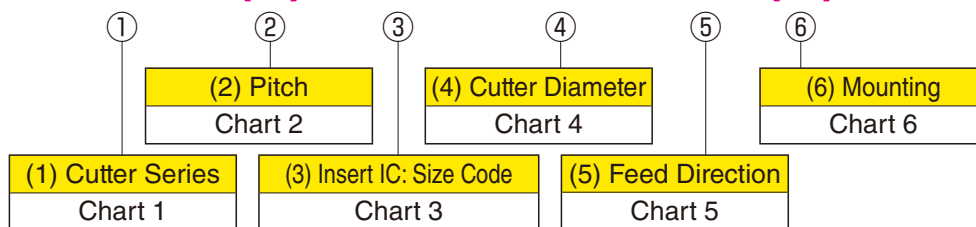


Chart 1: Cutter Series

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

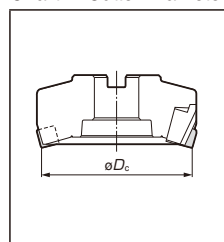


Chart 5: Feed Direction

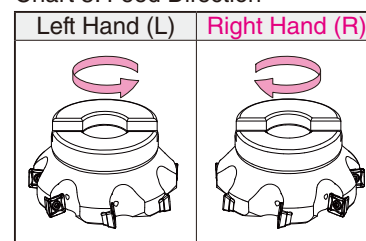
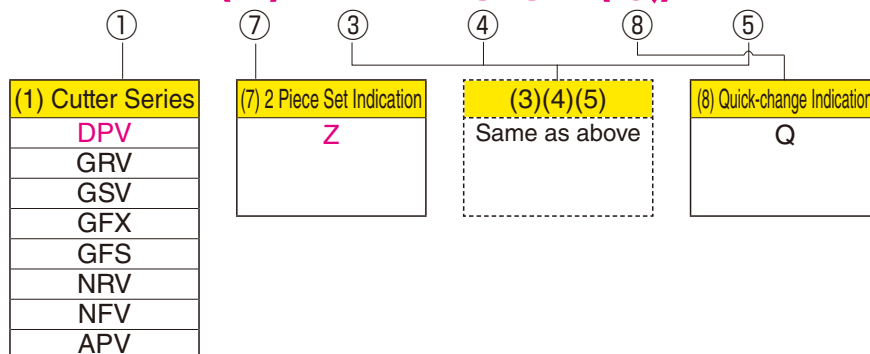


Chart 6: Mounting

Bore Size System
S Metric

HIGH FEED TYPE

DPV (Z) 4 100 (Q) R



(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

H

Milling Cutters

Face Milling

Radius

Multi-Purpose

Shoulder Milling

R/Copying

Groove/T-Slot

Chamfering

Aluminium/Light Alloys

High-Speed Cast Iron

(SEC-) Insert Identification Table

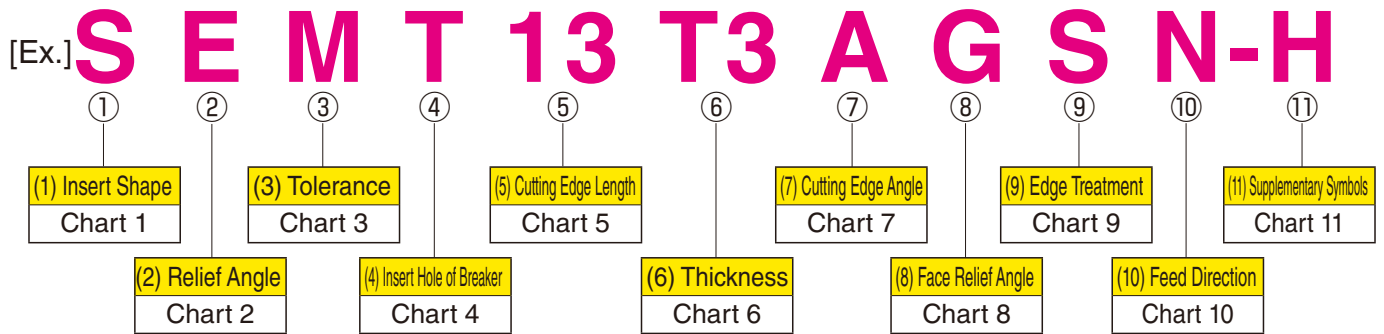


Chart 1: Insert Shape

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 Angle

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 Insert 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	

Chart 5: 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: Cutting Edge Angle

Symbol	Cutting Edge 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).