H

Indexable Endmills

H1 ~ H29

SEC-Indexable Endmill Selection Guide

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

Usage	Appearance	Series	Insert Cat. No. and Diagram	Approach Angle (Corner Profile) / Max. DOC (mm)	Rake Angle Axial	Rake Angle Radial	Diameter (mm)	Application: General-purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	Applicable Work Material P: General Steel · Cartion Steel · Alloy Steel	P: Die Steel · Tempered Steel	M: Stainless Steel	K: Cast Iron · Ductile Cast Iron	N: Non-Ferrous Metal	N: Aluminum Alloy	S: Ti Alloy · Heat-resistant Alloy	H: Hardened Steel 45-55HRC	Ref. Page
Face Milling	WGC-EW	WGC3000EW	SEMT0903AGSN (3000 Type)	4mm 45°	20°	−10° ~ −19°	ø20 ~ ø63	◎				○			○			◎	◎	◎	◎	◎	◎	◎		H14
		WGC4000EW		6mm 45°	20° ~ 22°	−20° ~ −24°	ø32 ~ ø63	◎				○			○			◎	◎	◎	◎	◎	◎	◎		H14
	WGC	WGC3000RS	SEMT13T3AGSN (4000 Type)	4mm 45°	20°	−10° ~ −19°	ø32 ~ ø63	◎				○			○			◎	◎	◎	◎	◎	◎	◎		H14
		WGC4000RS WGCF4000RS		6mm 45°	20° ~ 22°	−20° ~ −24°	ø40 ~ ø63	◎				○			○			◎	◎	◎	◎	◎	◎	◎		H14
	UFO-E	UFO4000E	SFKN12T3AZTN	5.5mm 45°	27°	−7°	ø50 ~ ø80	○				○			○			○	○	○	○	○	○	○		H23
	FPE	FPE4000	SDKN42MT	6.5mm 45°	15°	−4°	ø50 ~ ø80	○				○			○			○	○	○	○		○			H23
	WRC	WRC1200 WRCF1200	QPMT120440PPEN	6mm	−3°	0°	ø50 ~ ø80	◎				○	◎	◎				◎	◎	◎	◎			○	○	H16
	WRC-E	WRC0800E	QPMT080330PPEN (A=8) QPMT10T335PPEN (A=10)	4mm	−3°	0°	ø20 ~ ø25	◎				○	◎	◎				◎	◎	◎	◎			○	○	H16
		WRC1000E		5mm	−3°	0°	ø16 ~ ø32	◎				○	◎	◎				◎	◎	◎	◎			○	○	H16
	WRC-E	WRC1600E	QPMT160660PPEN (A=16) QPMT200670PPEN (A=20)	8mm	−3°	0°	ø40 ~ ø63	◎				○	◎	◎				◎	◎	◎	◎			○	○	H17
		WRC2000E		10mm	−3°	0°	ø50	◎				○	◎	◎				◎	◎	◎	◎			○	○	H17
	BRC-ES	BRC-ES	RDHX0701M0T	0.5mm	0°	0°	ø12 ~ ø20		◎									×	×	×	◎ (FC)				◎	H28 L62
	BRC-R	BRC-R	RDHX1003M0T	0.5mm	0°	0°	ø42 ~ ø66		◎									×	×	×	◎ (FC)				◎	H28 L62
Shoulder Milling	WFM	WFM4000E WFM4000E-C	XDMT120408PDEN-G	10mm 0°	10° ~ 17°	10° ~ 16°	ø40 ~ ø80	○			◎	○						◎	○	○	○		×			H15
	WEX-E New	WEX2000E WEX2000EL	AXMT123504PEER-G AXMT170508PEER-G	10mm 0°	14° ~ 25°	10° ~ 18°	ø14 ~ ø63	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H6
		WEX3000E (-C) WEX3000ES (-C) WEX3000EL		14mm 0°	16° ~ 24°	8° ~ 15°	ø25 ~ ø63	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H7
	WEX-F/R New	WEX2000F	AXMT123504PEER-G AXMT170508PEER-G	10mm 0°	23° ~ 25°	16° ~ 18°	ø40 ~ ø63	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H6
		WEX3000F WEX3000R WEXF3000R		14mm 0°	19° ~ 24°	12° ~ 15°	ø40 ~ ø125	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H7
	WEM-E	WEM2000E (-C) WEM2000EL (-C)	APMT103504PDER APMT160508PDER	9mm 0°	7° ~ 11°	5° ~ 23°	ø10 ~ ø63	○			○	○	○					○	○	○	○	○	○	○		H8
		WEM3000E (-C) WEM3000EL (-C)		13mm 0°	7° ~ 11°	15° ~ 23°	ø25 ~ ø63	○			○	○	○					○	○	○	○	○	○	○		H9
	WEM-F	WEM2000F	APMT103504PDER APMT160508PDER	9mm 0°	7° ~ 11°	19° ~ 23°	ø40 ~ ø63	○			○	○	○					○	○	○	○	○	○	○		H8
		WEM3000F WEM3000F-C		13mm 0°	7° ~ 11°	19° ~ 23°	ø40 ~ ø63	○			○	○	○					○	○	○	○	○	○	○		H9

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Usage	Appearance	Series	Insert Cat. No. and Diagram	Approach Angle (Corner Profile) / Max. DOC (mm)	Rake Angle Axial	Rake Angle Radial	Diameter (mm)	Application: Face Milling: General-purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Slot Milling	Ramping	Copying	Chamfering	Boring	Finishing	Applicable Work Material: P: General Steel · Cannon Steel · Alloy Steel	P: Die Steel · Tempered Steel	M: Stainless Steel	K: Cast Iron · Ductile Cast Iron	N: Non- Ferrous Metal	N: Aluminum Alloy	S: Ti Alloy · Heat-resistant Alloy	H: Hardened Steel 45~55HRC	Ref. Page
Shoulder Milling	WRM-E	WRM20R-E	APMT103504PDER APMT160508PDER	26-53mm 0°	7° ~ 11°	15° ~ 16°	ø20 ~ ø40	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H13
		WRM30R-E		49-73mm 0°	7° ~ 11°	21° ~ 24°	ø40 ~ ø80	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H13
	WRM-F	WRM30R-F	APMT160508PDER	49-73mm 0°	7° ~ 11°	21° ~ 24°	ø40 ~ ø80	○			◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		H13
	CHE	CHE2000	TECN22R (A=6.35) TECN32R (A=9.525) TEEN43R (A=12.70)	8mm 0°	6° ~ 15°	− 3° ~ 0°	ø16 ~ ø28				○	○						○	○	○	○	○	○			H25
		CHE3000		13mm 0°	15°	− 3° ~ 0°	ø30 ~ ø40				○	○						○	○	○	○	○	○			H25
		CHE4000		16mm 0°	15°	2° ~ 4°	ø50 ~ ø80				○	○						○	○	○	○	○	○			H26
	FMS	FMS	TPCH43TR	8~19mm 0°	3° ~ 7°	− 4° ~ − 6°	ø16 ~ ø60				○	○						○	○	○	○	○				H27
Multi-purpose	WMM	WMM2000E/EL WMM2000ELH	APMT103504PDER APMT160508PDER	17-35mm 0°	7° ~ 11°	15° ~ 16°	ø20 ~ ø30	◎			◎	◎	◎	◎		◎		◎	◎	◎	◎	◎	◎	◎		H11
		WMM3000E/EL WMM3000ELH		39mm 0°	7° ~ 11°	17° ~ 19°	ø32 ~ ø40	◎			◎	◎	◎	◎		◎		◎	◎	◎	◎	◎	◎	◎		H11
Radius milling, 3D Profiling	WBMR	WBMR2000 WBMR2000L	ZNMT1804100-C	20-43mm	−10°	—	R10 (ø20) ~ R25 (ø50)					◎		◎				◎	◎	◎	◎			○	○	H21
	WBMF	WBMF1000	ZPGU1551050	0.1~0.4mm 0°	0°	—	R5 (ø10) ~ R15 (ø30)					◎		◎			◎	◎	◎	◎	◎				○	H22
	BES	BES	BEST160S (L)	0.4~0.7mm 0°	0°	0°	R8 (ø16) ~ R25 (ø50)							◎			◎	×	×	×	◎				×	L61
T-slot	TSE	TSE	CPMT060204N-US	9-22mm 0°	0°	0°	ø21 ~ ø50					○						○	○	○						H27
Chamfering	SCP	SCP	SDMA322 R0.8	45°	0°	0°	ø8 ~ ø32								○			○	○	○	○					H24
	SMC	SMC	SPMN422	45°	0°	0°	ø7 ~ ø35								○			○	○	○	○					H24
Milling of Aluminum & Non-Ferrous Metal	WAX New	WAX3000	AECT160404PEFRA	16-18mm 0°	19° ~ 25°	6°	ø50 ~ ø125	○			◎	◎	◎	◎				×	×	×	×	○	◎		×	H19
	WAX-E New	WAX3000E WAX3000EL	AECT160404PEFRA	16-18mm 0°	19° ~ 25°	6°	ø20 ~ ø40	○			◎	◎	◎	◎				×	×	×	×	○	◎		×	H19

※ In addition, "FMU-E type" diameter 37 - 60 (page G34 and page L58) is available for high speed milling of Cast Iron.

SEC-WaveMill
WEX Type

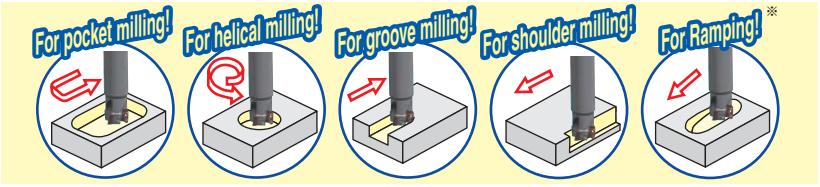
Strong Cutting Edge Design Coupled With A High Rigidity Body,
For Stable And High Efficiency Milling With Low Cutting Force!

New

Compatible with wide range of milling!

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

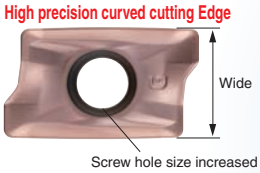
Tool diameter	Ramp Angle
φ25	5°
φ32	3°
φ40	2°
φ50	1°
φ63	0° 30′
φ80	0° 30′
φ100～	Impossible

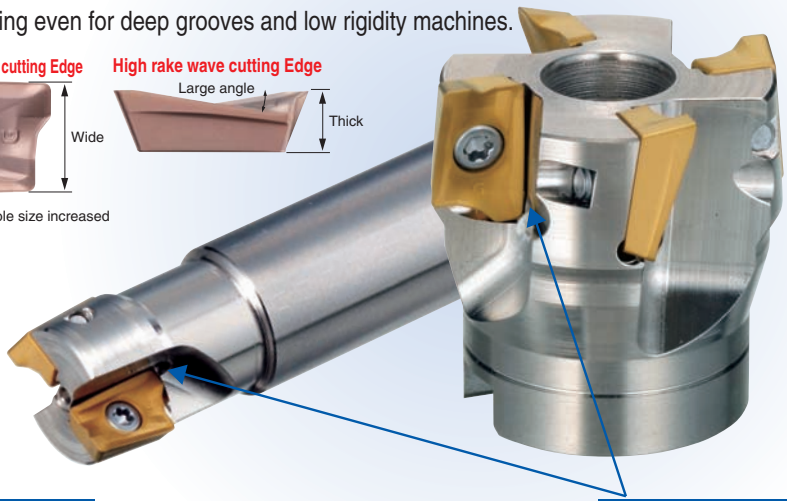


■ General Features

Precision insert with strong cutting edge and low cutting force design

- Unique curved cutting edge design lowers cutting resistance 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

- 3 types of chipbreaker. (L, G and H type)
- 5 new milling grades available for a wide range of work materials.

Utilizing the latest "Super ZX Coat" and "Super FF Coat" coating technologies.

(Steel milling grades)
ACP100,ACP200,ACP300
(Cast Iron milling grades)
ACK200,ACK300

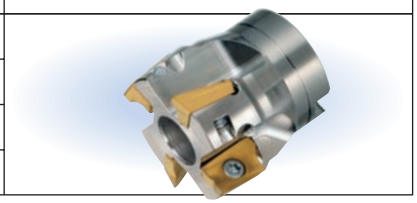
Highly durable body

- Special surface treatment improves corrosion resistance and scratch resistance.
- Increased screw size improves clamping force and durability.

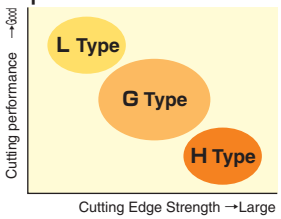
Internal coolant-holes are a standard feature for the whole series

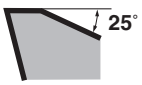
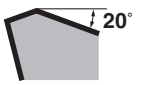
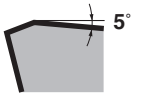
- Improved chip evacuation with air or coolant supply.

■ Product Range

	Series	Type	Cutter Diameter (mm) φ10 φ25 φ40 φ63 φ80 φ125	Shape
Shank Type	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 pitched type	40–63	
	WEX 3000ES-C	Short, coarse pitched type	50–63	
Shell Type	WEX 2000F	Standard type	40–63	
	WEX 3000F	Standard type	40–63	
	WEX 3000R	Standard type	80–125	
	WEXF 3000R	Fine pitched type	80–125	

■ Chipbreaker Selection Map

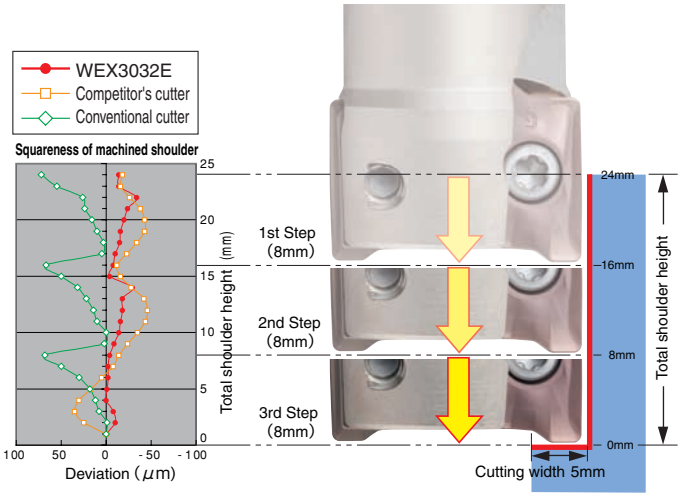


Work	Steel, Stainless Steel, Cast Iron		
Breaker	L Type 	G Type 	H Type 
Feature	Low cutting force	General Purpose	Strong Edge
Figure			
Application	Light cut, low rigidity milling and reduce burrs	Main breaker General - Interrupted milling	Roughing, heavy interrupted and hardened steel milling

■ Cutting Performance

①Shoulder milling with better squareness

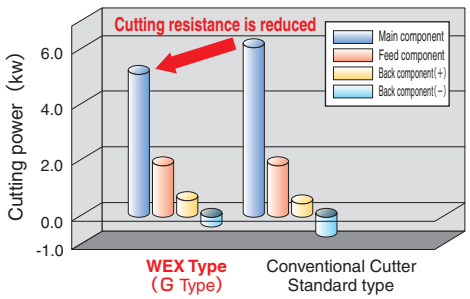
High accuracy cutting edges provide very small step marks (Less than half of competitor's)



(Conditons)
Work : SS400
Holder : WEX3032E (φ32)
Insert : AXMT170508PEER-G
Grade : ACP200
Cutting speed : V=150m/min
Feed : f=0.15mm/t (F=675mm/min)
Cutting width : Rd=5mm
Cutting depth : Ad=8mm×3 passes

②Cutting Force

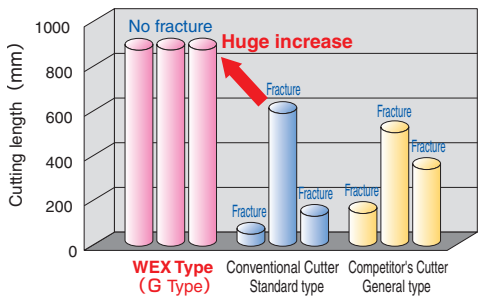
Cutting resistance (main component) is approx 15% lower than conventional cutters.



(Conditons)
Work : S50C
Holder : WEX3032E (φ32)
Insert : AXMT170508PEER-G
Grade : ACP200
Cutting speed : V=200m/min
Feedrate : f=0.2mm/t (F=1,200mm/min)
Cutting width : Rd=8mm
Cutting depth : Ad=10mm

③Fracture resistance

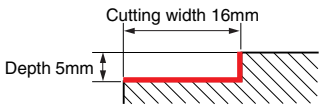
Huge increase in fracture resistance with improved cutting edge strength.



(Conditons)
Work : SCM440
Holder : WEX3032E (φ32)
Insert : AXMT170508PEER-G
Grade : ACP200
Cutting speed : V=100m/min
Feedrate : f=0.4mm/t (F=1,260mm/min)
Cutting width : Rd=25mm
Cutting depth : Ad=3mm

■ Recommended Conditions

Holder : WEX3032E Insert : AXMT170508PEER-G
Conditons : Cutting depth 5mm, Cutting width 16mm

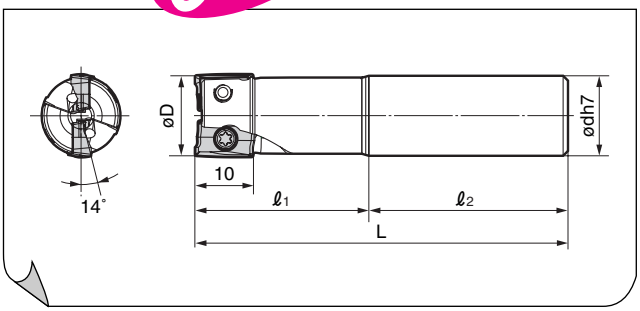


ISO classification	Material	Workpiece hardness (HB)	Chipbreaker	Grade														
				ACP100			ACP200			ACP300			ACK200			ACK300		
				Feedrate (mm/t)														
				0.12	0.25	0.35	0.12	0.25	0.35	0.12	0.25	0.35	0.12	0.25	0.35	0.12	0.25	0.35
				Cutting speed (m/min)														
P	Steel、Carbon 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	G	210	180	160	180	160	140	160	140	120						
	SUS403 and others (Martensitic, Hardened)	240	G	180	150	130	150	130	110	130	110	90						
	〃 SUS304, SUS316 (Austenitic)	180	G	230	200	180	200	180	160	180	160	140						
K	Cast Iron		G										300	270	250	270	250	230
	Ductile Cast Iron		G										200	170	150	170	150	130
S	Exotic Alloy (Heat resistant alloy, Super alloy, Ti alloy, etc.)		G										50	30		50	30	

SEC-WaveMill
WEX 2000E/EL Type

10mm 0°

New



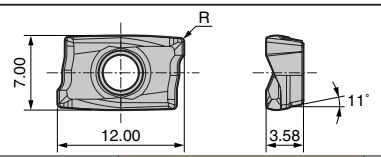
Body (Standard type)

Cat. No.	Stock	Dimensions (mm)					No. of teeth
		øD	ød	ℓ1	ℓ2	L	
WEX 2014E	○	14	16	25	55	80	1
WEX 2016E	○	16	16	25	75	100	2
WEX 2018E	○	18	16	25	75	100	2
WEX 2020E	○	20	20	30	80	110	3
WEX 2022E	○	22	20	30	80	110	3
WEX 2025E	○	25	25	35	85	120	4
WEX 2028E	○	28	25	35	85	120	4
WEX 2030E	○	30	25	35	85	120	4
WEX 2032E	○	32	32	40	90	130	5
WEX 2040E	○	40	32	30	120	150	6
WEX 2050E	○	50	32	30	120	150	7
WEX 2063E	○	63	32	30	120	150	8
(Long type)							
WEX 2014EL	○	14	16	25	95	120	1
WEX 2016EL	○	16	16	25	120	145	2
WEX 2018EL	○	18	16	25	120	145	2
WEX 2020EL	○	20	20	40	110	150	2
WEX 2022EL	○	22	20	30	120	150	2
WEX 2025EL	○	25	25	50	120	170	2
WEX 2028EL	○	28	25	30	140	170	2
WEX 2030EL	○	30	25	30	140	170	2
WEX 2032EL	○	32	32	60	120	180	2
WEX 2040EL	○	40	32	30	150	180	2

Inserts are not included.

Insert

(mm)



Cat. No.	Coated Carbide					Carbide	DLC	Dimensions
	ACP 100	ACP 200	ACP 300	ACK 200	ACK 300	H1	DL 1000	R
AXMT 123504PEER-G	●	●	●	●	●	–	–	0.4
AXMT 123508PEER-G	●	●	●	●	●	–	–	0.8
AXMT 123512PEER-G	●	●	●	●	●	–	–	1.2
AXMT 123504PEER-H	●	●	●	●	●	–	–	0.4
AXMT 123508PEER-H	●	●	●	●	●	–	–	0.8
AXMT 123512PEER-H	●	●	●	●	●	–	–	1.2
AXET 123502PEFR-S	–	–	–	–	–	○	○	0.2
AXET 123504PEFR-S	–	–	–	–	–	○	○	0.4
AXET 123508PEFR-S	–	–	–	–	–	○	○	0.8

G : General type H : Strong edge S: For Aluminum

Parts

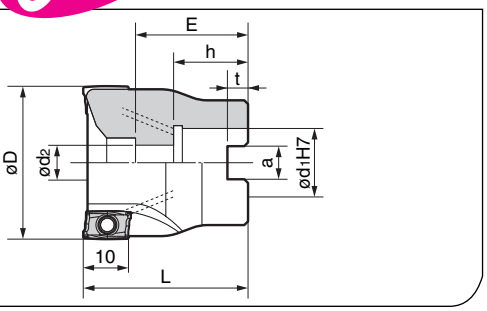
Screw	Wrench	Applicable endmill
		
BFTX0305IP	TRDR08IP	WEX2014E～WEX2018E
BFTX0306IP		WEX2020E～WEX2063E

Anti-seizure cream SUMI-P included in the package.

SEC-WaveMill
WEX 2000F Type

10mm 0°

New



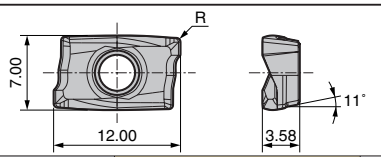
Body (Standard type)

Cat. No.	Stock	Dimensions (mm)								No. of teeth
		øD	ød1	ød2	a	t	L	E	h	
WEX 2040F	○	40	16	9	8.4	5.6	40	28	18	6
WEX 2050F	○	50	22	11	10.4	6.3	40	26	20	7
WEX 2063F	○	63	22	11	10.4	6.3	40	26	20	8

Inserts are not included.

Insert

(mm)



Cat. No.	Coated Carbide					Carbide	DLC	Dimensions
	ACP 100	ACP 200	ACP 300	ACK 200	ACK 300	H1	DL 1000	R
AXMT 123504PEER-G	●	●	●	●	●	–	–	0.4
AXMT 123508PEER-G	●	●	●	●	●	–	–	0.8
AXMT 123512PEER-G	●	●	●	●	●	–	–	1.2
AXMT 123504PEER-H	●	●	●	●	●	–	–	0.4
AXMT 123508PEER-H	●	●	●	●	●	–	–	0.8
AXMT 123512PEER-H	●	●	●	●	●	–	–	1.2
AXET 123502PEFR-S	–	–	–	–	–	○	○	0.2
AXET 123504PEFR-S	–	–	–	–	–	○	○	0.4
AXET 123508PEFR-S	–	–	–	–	–	○	○	0.8

G : General type H : Strong edge S: For Aluminum

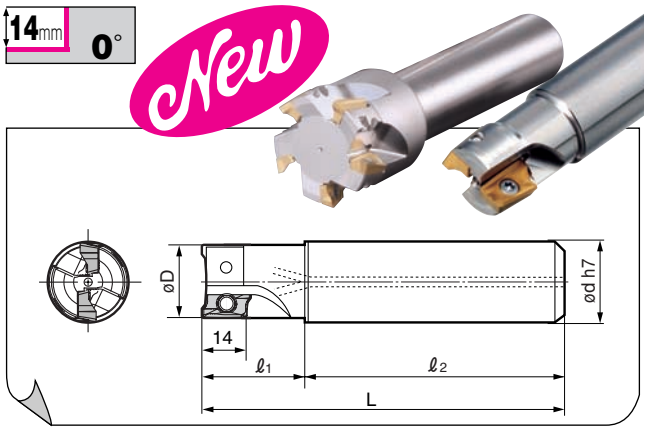
Parts

Screw	Wrench	Applicable endmill
		
BFTX0306IP	TRDR08IP	WEX2040F～WEX2063F

SEC-Endmill

SEC-WaveMill
WEX 3000 E/ES/EL E-C/ES-C Type

14mm 0°



■ Body (Standard type)

Cat. No.	Stock	Dimensions (mm) øD	ød	ℓ1	ℓ2	L	No. of teeth
WEX 3025E-20	●	25	20	35	85	120	2
WEX 3025E	●	25	25	35	85	120	2
WEX 3028E	●	28	25	35	85	120	2
WEX 3030E	●	30	25	40	90	130	3
WEX 3032E-25	●	32	25	40	90	130	3
WEX 3032E	●	32	32	40	90	130	3
WEX 3035E	●	35	32	40	90	130	3
WEX 3040E	●	40	32	50	120	170	4
WEX 3050E	●	50	32	50	120	170	5
WEX 3063E	●	63	32	50	120	170	6
(Short type)							
WEX 3050ES	●	50	32	25	110	135	5
WEX 3050ES-42	●	50	42	25	110	135	5
WEX 3063ES	●	63	32	25	110	135	6
WEX 3063ES-42	●	63	42	25	110	135	6
(Long type)							
WEX 3025EL	●	25	25	50	120	170	2
WEX 3028EL	●	28	25	50	120	170	2
WEX 3030EL	●	30	25	60	120	180	2
WEX 3032EL	●	32	32	60	120	180	2
WEX 3035EL	●	35	32	60	120	180	2
WEX 3040EL	●	40	32	80	140	220	2
(Coarse pitch type)							
WEX 3040E-C	●	40	32	50	120	170	3
WEX 3050E-C	●	50	32	50	120	170	3
WEX 3063E-C	●	63	32	50	120	170	4
(Short, coarse pitch type)							
WEX 3050ES-C	●	50	32	25	110	135	3
WEX 3050ES-C-42	●	50	42	25	110	135	3
WEX 3063ES-C	●	63	32	25	110	135	4
WEX 3063ES-C-42	●	63	42	25	110	135	4

Inserts are not included.

■ Insert

Refer to table on the right

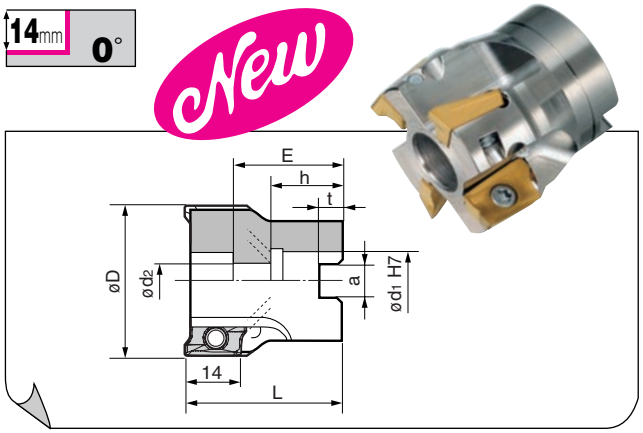
■ Parts

Screw	Wrench	Applicable endmill
		
BFTX0407IP	TRDR15IP	WEX 3025E(EL)~3030EL
BFTX0409IP		WEX 3032E(EL)~3063E(ES)

Anti-seizure cream SUMI-P included in the package.

SEC-WaveMill
WEX 3000F/R Type WEXF 3000R Type

14mm 0°



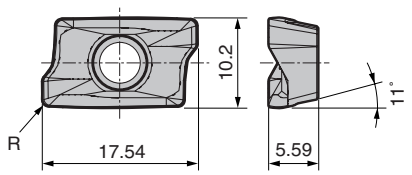
■ Body (Standard type)

Cat. No.	Stock	Dimensions (mm) øD	ød1	ød2	a	t	L	E	h	No. of teeth
WEX 3040F	●	40	16	9	8.4	5.6	40	28	18	4
WEX 3050F	●	50	22	11	10.4	6.3	40	26	20	5
WEX 3063F	●	63	22	11	10.4	6.3	40	26	20	6
WEX 3080R	●	80	25.4	13	9.5	6	50	31	25	4
WEX 3100R	●	100	31.75	17	12.7	8	63	39.5	32.5	5
WEX 3125R	●	125	38.1	21	15.9	10	63	40	35.5	6
(Fine pitch type)										
WEXF 3080R	●	80	25.4	13	9.5	6	50	31	25	7
WEXF 3100R	●	100	31.75	17	12.7	8	63	39.5	32.5	8
WEXF 3125R	●	125	38.1	21	15.9	10	63	40	35.5	9

Inserts are not included.

■ Insert

(mm)



Cat. No.	Coated Carbide ACP 100	ACP 200	ACP 300	ACK 200	ACK 300	Carbide H1	DLC DL 1000	Dimensions R
AXMT 170508PEER-L	●	●	●	●	●	–	–	0.8
AXMT 170504PEER-G	●	●	●	●	●	–	–	0.4
AXMT 170508PEER-G	●	●	●	●	●	–	–	0.8
AXMT 170512PEER-G	●	●	●	●	●	–	–	1.2
AXMT 170516PEER-G	●	●	●	●	●	–	–	1.6
AXMT 170520PEER-G *	●	●	●	●	●	–	–	2.0
AXMT 170530PEER-G *	●	●	●	●	●	–	–	3.0
AXMT 170508PEER-H	●	●	●	●	●	–	–	0.8
AXMT 170512PEER-H	●	●	●	●	●	–	–	1.2
AXET 170502PEFR-S	–	–	–	–	–	●	●	0.2
AXET 170504PEFR-S	–	–	–	–	–	●	●	0.4
AXET 170508PEFR-S	–	–	–	–	–	●	●	0.8

L : Low cutting force G : General type H : Strong edge S: For Aluminum

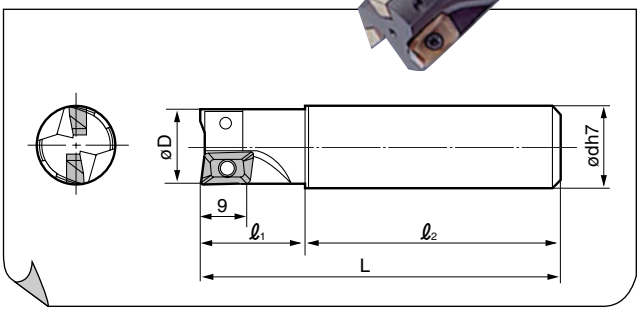
* cutter body modification is required

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX0409IP	TRDR15IP	WEX3000F type/WEX3000R type WEXF3000R type

SEC-WaveMill
WEM 2000 E/E-C EL/EL-C Type

9mm 0°



■ Body (Standard type) (★Shank diamater is 1mm smaller than øD)

Cat. No.	Stock	Dimensions (mm)					No. of teeth
		øD	ød	ℓ1	ℓ2	L	
WEM 2010E	●	10	12	20	60	80	1
WEM 2012E	●	12	12	25	55	80	1
WEM 2014E	●	14	16	25	55	80	1
WEM 2016E	●	16	16	25	65	90	2
WEM 2018E	●	18	16	25	65	90	2
WEM 2020E	●	20	20	30	80	110	3
WEM 2022E	●	22	25	30	80	110	3
WEM 2025E	●	25	25	35	85	120	4
WEM 2028E	●	28	25	35	85	120	4
WEM 2030E	●	30	32	35	85	120	4
WEM 2032E	●	32	32	35	85	120	5
WEM 2040E	●	40	32	40	85	125	6
WEM 2050E	●	50	32	40	85	125	7
WEM 2063E	●	63	32	40	85	125	9
(Long type)							
WEM 2020EL	●	20	20	50	100	150	3
★ **WEM 2021EL**	●	21	20	30	120	150	3
WEM 2022EL	●	22	20	30	120	150	3
WEM 2025EL	●	25	25	60	100	160	4
★ **WEM 2026EL**	●	26	25	35	125	160	4
WEM 2027EL	●	27	25	35	125	160	4
WEM 2032EL	●	32	32	80	100	180	5
★ **WEM 2033EL**	●	33	32	35	145	180	5
WEM 2035EL	●	35	32	35	145	180	5
WEM 2040EL	●	40	32	100	100	200	6
(Coarse pitch type)							
WEM 2020E-C	●	20	20	30	80	110	2
WEM 2025E-C	●	25	25	35	85	120	2
WEM 2032E-C	●	32	32	35	85	120	3
(Long, coarse pitch type)							
WEM 2020EL-C	●	20	20	30	120	150	2
WEM 2021EL-C	●	21	20	30	120	150	2
WEM 2022EL-C	●	22	20	30	120	150	2
WEM 2025EL-C	●	25	25	35	125	160	2
WEM 2026EL-C	●	26	25	35	125	160	2
WEM 2027EL-C	●	27	25	35	125	160	2
WEM 2032EL-C	●	32	32	35	145	180	3
WEM 2033EL-C	●	33	32	35	145	180	3
WEM 2035EL-C	●	35	32	35	145	180	3

-C : Large chip pocket type
Inserts are not included.

■ Insert

Refer to table on the right

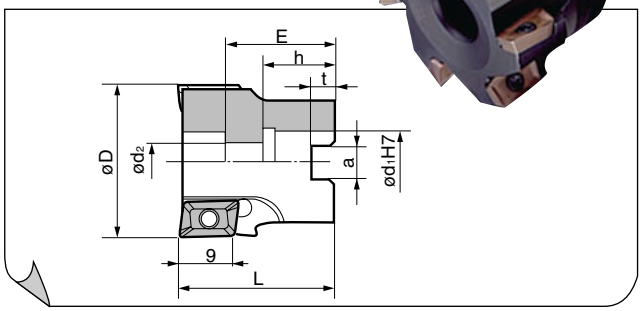
■ Parts

Screw	Wrench	Applicable endmill (φ D)
		
BFTX02505N	TRD08	Below ø18mm
BFTX02506N		Over ø20mm

Anti-seizure cream SUMI-P included in the package.

SEC-WaveMill
WEM 2000F Type

9mm 0°

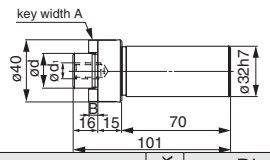


■ Body

Cat. No.	Stock	Dimensions (mm)								No. of teeth
		øD	ød1	ød2	a	t	L	h	E	
WEM 2040F	●	40	16	9	8.4	5.6	40	18	28	6
WEM 2050F	●	50	22	11	10.4	6.3	40	20	26	7
WEM 2063F	●	63	22	11	10.4	6.3	40	20	26	9

Inserts are not included.

■ Holder

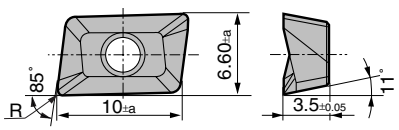


For cutter body clamping, a common hexagonal-head bolt should be use.

Cat. No.	Stock	Dimensions (mm)				Appalicable endmill (øDmm)
		ød	ød1	A	B	
WEM-ST32-16	●	16	M8	8	5	ø40
WEM-ST32-22	●	22	M10	10	5.5	ø50 ø63

■ Insert

(mm)



Cat. No.	Coated Carbide			Carbide	DLC	Nose R	Tolerance
	ACZ 350	ACZ 330	ACZ 310	H1	DL 1000	R	a
APMT 103504PDER	●	●	●	–	–	0.4	0.08
APMT 103508PDER	●	●	●	–	–	0.8	0.08
APMT 103512PDER	●	●	●	–	–	1.2	0.08
APMT 103504PDER-H	●	●	●	–	–	0.4	0.08
APMT 103508PDER-H	●	●	●	–	–	0.8	0.08
APMT 103512PDER-H	●	●	●	–	–	1.2	0.08
APET 103504PDER-F	●	●	●	–	–	0.4	0.025
APET 103504PDFR-S	–	–	–	●	●	0.4	0.025

H : Strong edge、F : Ground insert、S : For Aluminum

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX02506N	TRD08	WEM2000F

Anti-seizure cream SUMI-P included in the package.

■ Recommended Conditions

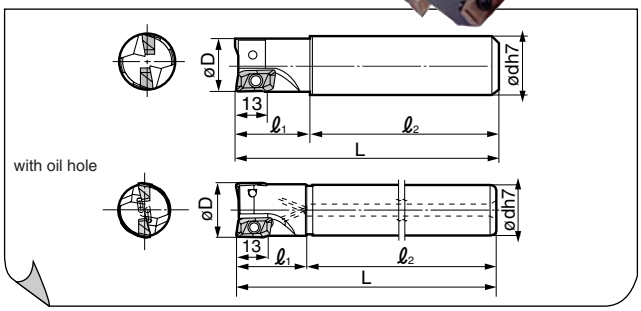
øD (mm) \ Material		Carbon steel (ex. S40C～S50C)	Stainless steel (ex.SUS304)	Cast iron (ex.FC200)	Al. alloy (ex.ADC12)
10 ~ 22	V	80-**100**-120	70-**100**-120	80-**100**-120	200-**300**-500
	f	0.08-**0.10**-0.15	0.08-**0.10**-0.15	0.08-**0.10**-0.15	0.08-**0.10**-0.15
25 ~ 40	V	100-**150**-180	80-**140**-160	100-**150**-180	200-**500**-1000
	f	0.1-**0.12**-0.20	0.1-**0.12**-0.20	0.1-**0.15**-0.20	0.10-**0.15**-0.20
50 ~ 63	V	100-**150**-180	80-**140**-160	100-**150**-180	200-**500**-1000
	f	0.1-**0.12**-0.20	0.1-**0.12**-0.20	0.1-**0.15**-0.20	0.10-**0.15**-0.20
Grade		ACZ330	ACZ350	ACZ310	DL1000(H1)

[V=m/min、f=mm/t] [min.-optimum-max.]

SEC-Endmill

SEC-WaveMill
WEM 3000 E/E-C EL/EL-C EXLH/EXLH-C Type

13mm 0°



■ Body (Standard type) (★Shank diamater is 1mm smaller than øD)

	Cat. No.	Stock	Dimensions (mm) øD	ød	ℓ1	ℓ2	L	No. of teeth
	WEM 3025E	●	25	25	35	85	120	2
	WEM 3030E	●	30	25	35	85	120	3
	WEM 3032E	●	32	32	35	85	120	3
	WEM 3040E	●	40	32	40	85	125	4
	WEM 3050E	●	50	32	40	85	125	5
	WEM 3063E	●	63	32	40	85	125	6
	(Long type)							
	WEM 3025EL	●	25	25	60	100	160	2
★	**WEM 3026EL**	●	26	25	35	125	160	2
	WEM 3027EL	●	27	25	35	125	160	2
	WEM 3030EL	●	30	25	35	145	180	3
	WEM 3032EL	●	32	32	80	100	180	3
★	**WEM 3033EL**	●	33	32	35	145	180	3
	WEM 3035EL	●	35	32	35	145	180	3
	WEM 3040EL	●	40	32	100	100	200	4
	(Coarse pitch type)							
	WEM 3040E-C	●	40	32	40	85	125	2
	WEM 3050E-C	●	50	32	40	85	125	3
	WEM 3063E-C	●	63	32	40	85	125	3
	(Long, coarse pitch type)							
	WEM 3040EL-C	●	40	32	40	160	200	2
	WEM 3050EL-C	●	50	42	40	180	220	3
	WEM 3063EL-C	●	63	42	40	210	250	3
	(Extra long type with oil hole)							
	WEM 3027EXLH		27	25	35	265	300	2
	WEM 3035EXLH		35	32	35	315	350	3
	(Extra long, coarse pitch type with oil hole)							
	WEM 3040EXLH-C		40	32	40	360	400	2
	WEM 3050EXLH-C		50	42	40	380	420	3
	WEM 3063EXLH-C		63	42	40	410	450	3

-C : Large chip pocket type
Inserts are not included.

■ Insert

Refer to table on the right

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX03584	TRD15	WEM3000E/EL
BFTX03588		WEM3000E-C

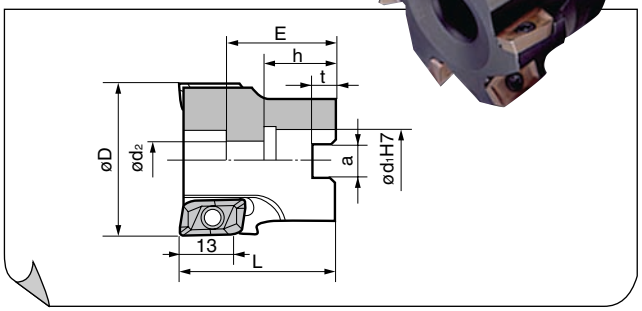
■ Recommended Conditions (Not for exra long type)

øD (mm)	Material		Carbon steel (ex.S40C～S50C)	Stainless steel (ex.SUS304)	Cast iron (ex.FC200)	Al. alloy (ex.ADC12)
25 ～ 40	V		100-**150**-180	80-**140**-160	100-**150**-180	200-**300**-500
	f		0.1-**0.20**-0.25	0.1-**0.15**-0.20	0.1-**0.20**-0.25	0.1-**0.15**-0.2
50 ～ 63	V		100-**150**-180	80-**140**-160	100-**150**-180	200-**500**-1000
	f		0.1-**0.20**-0.25	0.1-**0.15**-0.20	0.1-**0.20**-0.25	0.1-**0.15**-0.2
Grade			ACZ330	ACZ350	ACZ310	DL1000(H1)

[V=m/min、f=mm/t] [min.-optimum-max.]

SEC-WaveMill
WEM 3000F/F-C Type

13mm 0°

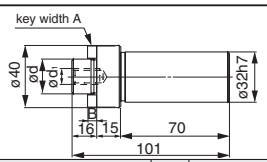


■ Body

Cat. No.	Stock	Dimensions (mm) øD	ød1	ød2	a	t	L	h	E	No. of teeth
WEM 3040F	●	40	16	9	8.4	5.6	40	18	28	4
WEM 3050F	●	50	22	11	10.4	6.3	40	20	26	5
WEM 3063F	●	63	22	11	10.4	6.3	40	20	26	6
(Coarse pitch type)										
WEM 3040F-C		40	16	9	8.4	5.6	40	18	28	2
WEM 3050F-C	●	50	22	11	10.4	6.3	40	20	26	3
WEM 3063F-C	●	63	22	11	10.4	6.3	40	20	26	3

-C : Large chip pocket type
Inserts are not included.

■ Holder

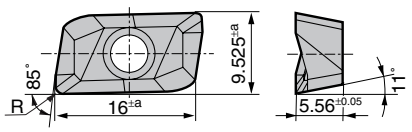


For cutter body clamping, a common hexagonal-head bolt can be use.

Cat. No.	Stock	Dimensions (mm) ød	ød1	A	B	Appalicable endmill (øD)
WEM-ST32-16	●	16	M8	8	5	ø40mm
WEM-ST32-22	●	22	M10	10	5.5	ø50mm ø63mm

■ Insert

単位：(mm)



Cat. No.	Coated Carbide ACZ 350	ACZ 330	ACZ 310	Carbide H1	DLC DL 1000	Nose R R	Tolerance a
APMT 160508PDER	●	●	●	–	–	0.8	0.08
APMT 160512PDER	●	●	●	–	–	1.2	0.08
APMT 160516PDER	●	●	●	–	–	1.6	0.08
APMT 160508PDER-H	●	●	●	–	–	0.8	0.08
APMT 160512PDER-H	●	●	●	–	–	1.2	0.08
APMT 160516PDER-H	●	●	●	–	–	1.6	0.08
APMT 160520PDER-H *	●	●	●	–	–	2.0	0.08
APMT 160530PDER-H *	●	●	●	–	–	3.0	0.08
APMT 160540PDER-H *	●	●	●	–	–	4.0	0.08
APMT 160550PDER-H *	●	●	●	–	–	5.0	0.08
APMT 160560PDER-H *	●	●	●	–	–	6.0	0.08
APET 160508PDER-F	●	●	●	–	–	0.8	0.025
APET 160504PDFR-S	–	–	–	●	●	0.4	0.025
APET 160508PDFR-S	–	–	–	●	●	0.8	0.025

H : Strong edge F : Ground insert S : For Aluminum
* cutter body modification is required

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX03584	TRD15	WEM3000F
BFTX03588		WEM3000F-C

SEC-WaveMill
WMM Type

1 Cutter Body, 1 Insert Geometry, Multiple Applications.

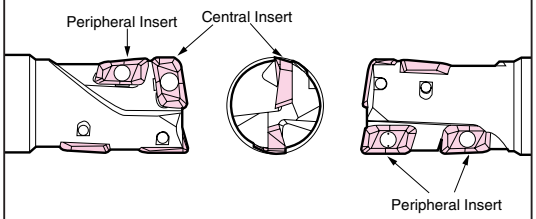
■ General Features

Utilising some of the design features, which made the WaveMill so successful, this multi-functional cutter, which utilises standard wave shaped inserts mounted radially and axially, performs a variety of operations. These include grooving, shoulder milling, ramping, pocketing, drilling, helical cutting etc and eliminates the need to stock a variety of application specific tools.

■ Advantages and Application

- 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 inserts gives smooth cutting action
- Good dimensional stability thanks to long life inserts
- Best suited for Stainless Steel machining

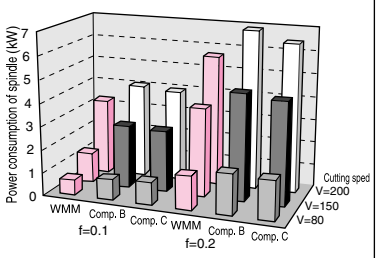
● Insert orientation of WMM type cutter



■ Production Range

Model	Type	Cutter diameter (mm) φ20 – φ30 – φ40
2000E	Standard type	20 – 30
2000EL	Long type	20 – 30
2000ELH	Long type with oil hole	20 – 30
2000EXLH	Extra-long type with oil hole	22 – 30
3000E	Standard type	32 – 40
3000EL	Long type	32 – 40
3000ELH	Long type with oil hole	32 – 40
3000EXLH	Extra-long type with oil hole	35 – 40

● Force Comparison (Groove Milling)



Diameter of tool used : φ25
Work material : S50C
Conditions : V=80,150,200mm/min, f=0.1,0.2mm/t
Ad=15mm Overhanging length of tool=40mm

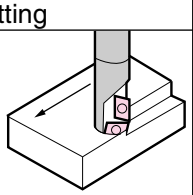
■ Multi-purpose Applications

Tool Used : WMM2025E

● Shoulder cutting

SUS304

Cutting of stainless steel too!

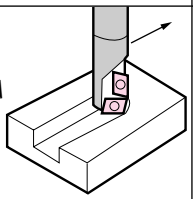


Tool dia. : φ25 Insert:APMT103504PDER(ACZ350)
Cutting width : Ad=25mm 、Rd=5mm
Cutting speed : V=120m/min、Feed : f=0.15mm/t
Air blow

● Grooving

FC250

Deep grooving can be performed easily. Easy chip removal

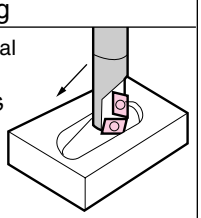


Tool dia. : φ25 Insert:APMT103504PDER(ACZ310)
Cutting width : Ad=15mm 、Rd=25mm
Cutting speed : V=180m/min、Feed : f=0.12mm/t
Air blow

● Taper cutting

S50C block material

Capable of tapered recess cutting of a prepared hole

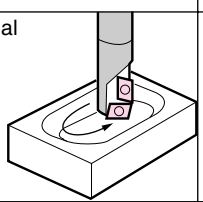


Tool dia. : φ25 Insert:APMT103504PDER(ACZ350)
Cutting width : Rd=25mm、Depth : d=15mm
Cutting speed : V=200m/min、Feed : f=0.1mm/t
Inclination angle : θ=15°
Air blow

● Pocketing

S50C block material

Capable of pocketing with contiunous lateral feed from intial drilling or taper cutting process

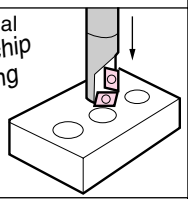


Tool dia : φ25 Insert:APMT103504PDER(ACZ350)
The following process was done in succession from a deep drilling process of 15mm depth.
Cutting width : Rd=25mm、Depth d=15mm
Cutting speed : V=200m/min、Feed : f=0.1mm/t
Air blow

● Drilling

S50C block material

Capable of easy chip removal and drilling without tool damages

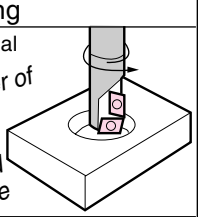


Tool dia. : φ25 Insert:APMT103504PDER(ACZ350)
Bore size : φ25mm、Depth : d=15mm
Cutting speed : V=200m/min、Feed : f=0.1mm/rev.
Step feed : 0.5mm
Air blow

● Helical cutting

S50C block material

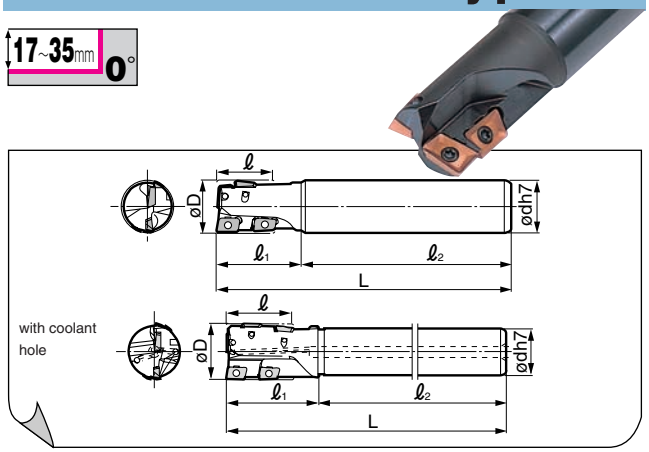
Capable of large boring in diameter of 1.2-1.8 times the cutter diameter without prepared hole



Tool dia. : φ25 Insert:APMT103504PDER(ACZ350)
Bore size : φ40mm、Depth : d=20mm
Cutting speed : V=300m/min、Feed : f=0.1mm/rev.
Axial feed : f=15mm/pitch
Air blow

SEC-WaveMill WMM 2000 E/EL ELH/EXLH Type

17~35mm 0°



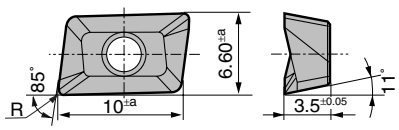
Body (Standard type/WMM2000E type)

Cat. No.	Stock	Dimensions (mm) øD	ød	ℓ	ℓ1	ℓ2	L	Total teeth	Effective teeth
WMM 2020E	●	20	20	17	35	95	130	3	1
WMM 2021E	●	21	20	17	35	95	130	3	1
WMM 2025E	●	25	25	26	40	100	140	4	1
WMM 2026E	●	26	25	26	40	100	140	4	1
WMM 2030E	●	30	25	35	50	100	150	5	1
(Long type)									
WMM 2020EL	●	20	20	17	60	125	185	3	1
WMM 2021EL	●	21	20	17	35	150	185	3	1
WMM 2025EL	●	25	25	26	75	145	220	4	1
WMM 2026EL	●	26	25	26	40	180	220	4	1
WMM 2030EL	●	30	25	35	50	180	230	5	1
(Long type with coolant hole)									
WMM 2020ELH	●	20	20	17	60	125	185	3	1
WMM 2021ELH	●	21	20	17	35	150	185	3	1
WMM 2025ELH	●	25	25	26	75	145	220	4	1
WMM 2026ELH	●	26	25	26	40	180	220	4	1
WMM 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
WMM 2027EXLH		27	25	26	40	215	320	4	1
WMM 2030EXLH		30	25	35	50	300	350	5	1

Inserts are not included.

Insert

(mm)



Cat. No.	Coated Carbide ACZ 350	ACZ 330	ACZ 310	Carbide H1	DLC DL 1000	Nose R R	Tolerance a
APMT 103504PDER	●	●	●	–	–	0.4	0.08
APMT 103508PDER	●	●	●	–	–	0.8	0.08
APMT 103512PDER	●	●	●	–	–	1.2	0.08
APMT 103504PDER-H	●	●	●	–	–	0.4	0.08
APMT 103508PDER-H	●	●	●	–	–	0.8	0.08
APMT 103512PDER-H	●	●	●	–	–	1.2	0.08
APET 103504PDER-F	●	●	●	–	–	0.4	0.025
APET 103504PDFR-S	–	–	–	●	●	0.4	0.025

H : Strong edge F : Ground insert S : For Aluminum

Parts

Screw	Wrench
	
BFTX02506N	TRD08

Anti-seizure cream SUMI-P included in the package.

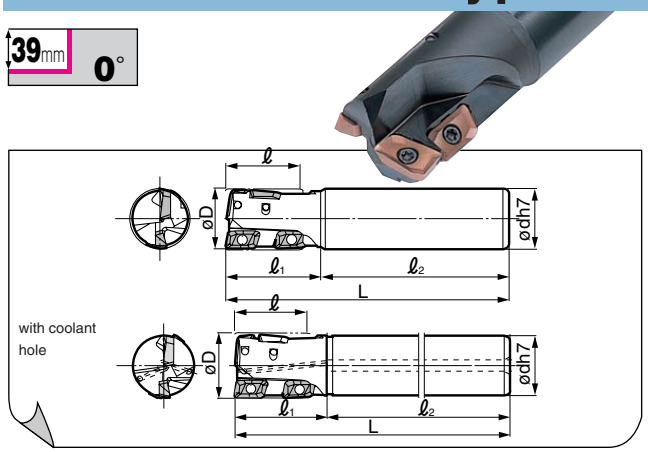
Recommended Conditions (Not for exra long type)

øD (mm)	Process		Material: Carbon steel (ex.S50C)	Stainless steel (ex.SUS304)	Cast iron (ex.FC200)	Al. alloy (ex.ADC12)
20 ~ 26	V	–	80-**120**-160	80-**100**-120	70-**150**-180	200-**300**-500
	f	Shoulder milling	0.05-0.20	0.05-0.15	0.05-0.20	0.10-0.15-0.20
		Grooving	0.05-0.12	0.05-0.10	0.05-0.12	0.05-0.10
		Drilling	0.05-0.18	0.05-0.12	0.05-0.18	0.05-0.10
Grade			ACZ330	ACZ350	ACZ310	DL1000(H1)

[V=m/min, f=mm/t] [min.-optimum-max.]

SEC-WaveMill WMM 3000 E/EL ELH/EXLH Type

39mm 0°



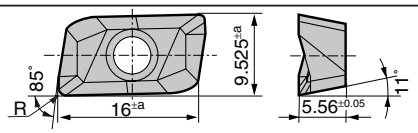
Body (Standard type/WMM3000E type)

Cat. No.	Stock	Dimensions (mm) øD	ød	ℓ	ℓ1	ℓ2	L	Total teeth	Effective teeth
WMM 3032E	●	32	32	39	50	100	150	4	1
WMM 3033E	●	33	32	39	50	100	150	4	1
WMM 3035E	●	35	32	39	50	100	150	4	1
WMM 3040E	●	40	32	39	55	105	160	4	1
(Long type)									
WMM 3032EL	●	32	32	39	90	140	230	4	1
WMM 3033EL	●	33	32	39	50	180	230	4	1
WMM 3035EL	●	35	32	39	50	180	230	4	1
WMM 3040EL	●	40	32	39	55	185	240	4	1
(Long type with coolant hole)									
WMM 3032ELH	●	32	32	39	90	140	230	4	1
WMM 3033ELH	●	33	32	39	50	180	230	4	1
WMM 3035ELH	●	35	32	39	50	180	230	4	1
WMM 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
WMM 3040EXLH		40	32	39	55	365	420	4	1

Inserts are not included.

Insert

(mm)



Cat. No.	Coated Carbide ACZ 350	ACZ 330	ACZ 310	Carbide H1	DLC DL 1000	Nose R R	Tolerance a
APMT 160508PDER	●	●	●	–	–	0.8	0.08
APMT 160512PDER	●	●	●	–	–	1.2	0.08
APMT 160516PDER	●	●	●	–	–	1.6	0.08
APMT 160508PDER-H	●	●	●	–	–	0.8	0.08
APMT 160512PDER-H	●	●	●	–	–	1.2	0.08
APMT 160516PDER-H	●	●	●	–	–	1.6	0.08
APMT 160520PDER-H *	●	●	●	–	–	2.0	0.08
APMT 160530PDER-H *	●	●	●	–	–	3.0	0.08
APMT 160540PDER-H *	●	●	●	–	–	4.0	0.08
APMT 160550PDER-H *	●	●	●	–	–	5.0	0.08
APMT 160560PDER-H *	●	●	●	–	–	6.0	0.08
APET 160508PDER-F	●	●	●	–	–	0.8	0.025
APET 160504PDFR-S	–	–	–	●	●	0.4	0.025
APET 160508PDFR-S	–	–	–	●	●	0.8	0.025

H : Strong edge F : Ground insert S : For Aluminum

* cutter body modification is required

Parts

Screw	Wrench
	
BFTX03584	TRD15

Anti-seizure cream SUMI-P included in the package.

Recommended Conditions (Not for exra long type)

øD (mm)	Process		Material: Carbon steel (ex.S50C)	Stainless steel (ex.SUS304)	Cast iron (ex.FC200)	Al. alloy (ex. ADC12)
32 ~ 40	V	–	80-**120**-160	80-**100**-120	70-**150**-180	200-**300**-500
	f	Shoulder milling	0.05-0.25	0.05-0.20	0.05-0.25	0.10-0.15-0.20
		Grooving	0.05-0.15	0.05-0.12	0.05-0.15	0.05-0.10
		Drilling	0.05-0.20	0.05-0.18	0.05-0.20	0.05-0.10
Grade			ACZ330	ACZ350	ACZ310	DL1000(H1)

[V=m/min, f=mm/t] [min.-optimum-max.]

SEC-WaveRepeater
WRM Type

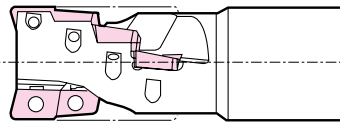
Long Flute With Multiple Insert Arrangement
For High Efficiency Deep Shoulder Milling

■ General Features

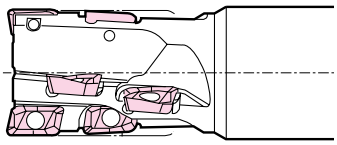
Complimenting the already successful WaveMill range of milling cutters the WRM helical cutter is ideal for deep shoulder milling operations where smooth cutting, efficient metal removal and extended tool life parameters are critical.
Using standard wave shaped inserts radially mounted in a zig zag arrangement to minimise harmonics, this cutter will efficiently remove metal at higher feed rates than conventional cutters thanks to its high shear cutting action.
Impressive feed rates substantially reduce cycle times, whilst the long life inserts employed significantly reduce the tool operationg costs.

■ Advantages and Application

- ●Ideal for heavy roughing operations thanks to high shear cutting action and ultra hard inserts
- ●High shear cutting action means heavy roughing operations possible on low power machines
- ●Multi flute design provides high feed capability with good chip evacuation
- ●Uses standard WaveMill inserts
- ●Suitable for most workpiece materials
- ●WRM20 series (using APMT1035 type inserts) utilizes 1 flute for 1 effective cutting tooth.
  Best suited for high feed cutting.
- ●WRM30 series (using APMT1605 type inserts) utilizes 2 flutes to form 1 effective cutting tooth with alternate overlapping inserts design.
  This reduces contact cutting forces, excellent for heavy cutting operations like groove milling.



WRM20-E type



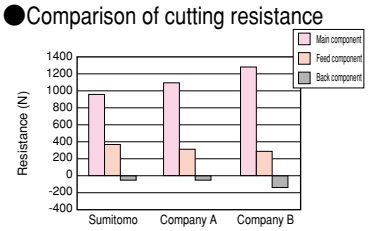
WRM30-E type

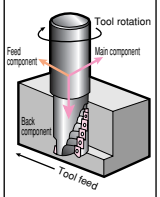
■ Product Range

Type	Cutter diameter(mm)	Cutter edge length(mm)	Insert used	Cutter Body
WRM20R-E	20～40	26～53	APMT1035 type	Shank type
WRM30R-E	40～50	49～61	APMT1605 type	Shank type
WRM30R-F	63～80	61～73	APMT1605 type	Shell type

■ Performance and Application Range

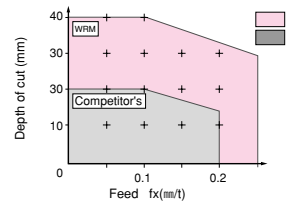
●Comparison of cutting resistance





Machine used : MC/BT50/22kW
Work material : S50C
Tool : WRM30R4049E-S42
Insert : APMT160508PDER(ACZ350)
Conditions : V=100m/min、f=0.05mm/t Ad=30mm、Rd=10mm、 Air Blow

●Comparison of application fields (Grooving)

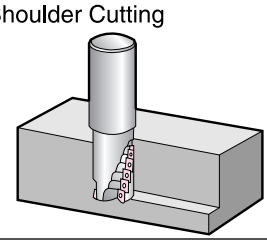


<Results>
Lower cutting resistance, lower spindle power and deeper cutting depth with high feed due to less chattering as compared to competitor's product

Machine used : MC/BT50/22kw.
Work material : S50C
Tool : φ40 (WRM30R4049E-S42)
Insert : APMT160508PDER-H
Cutting speed : V=80m/min

■ Application Example

● Shoulder Cutting



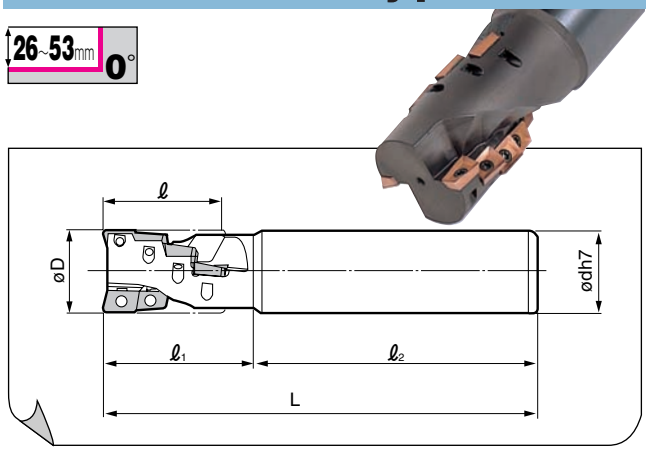
<Results>
Superior perfomance in view of surface roughness & chip removal as compared to competitor's products.
Cutting time is also reduced to 1/2 as our cutter cuts with one step with its long flute while competitor's perform 2 steps.

Machine used . MC horizontal type
Work material : SCM440
Tool : WRM20R2026E-S20
Insert : APMT103504PDER(ACZ350)

Conditions:
V =94m/min, (120m/min also possible)
F =120mm/min (fz=0.08mm/t)
Rd=1.5mm
Ad=23mm
Wet

SEC-WaveMill
WRM 20R-E Type

26~53mm 0°



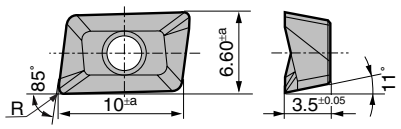
■ Body

Cat. No.	Stock	Dimensions (mm)						Total teeth	Effective teeth
		øD	ød	ℓ	ℓ1	ℓ2	L		
WRM 20R2026E-S20	●	20	20	26	35	85	120	4	1
WRM 20R2535E-S25	●	25	25	35	45	85	130	8	2
WRM 20R3244E-S32	●	32	32	44	55	85	140	10	2
WRM 20R4053E-S42	●	40	42	53	65	85	150	14	2

Inserts are not included.

■ Insert

(mm)



Cat. No.	Coated Carbide			Carbide	DLC	Nose R	Tolerance
	ACZ 350	ACZ 330	ACZ 310	H1	DL 1000	R	a
APMT 103504PDER	●	●	●	–	–	0.4	0.08
APMT 103508PDER	●	●	●	–	–	0.8	0.08
APMT 103512PDER	●	●	●	–	–	1.2	0.08
APMT 103504PDER-H	●	●	●	–	–	0.4	0.08
APMT 103508PDER-H	●	●	●	–	–	0.8	0.08
APMT 103512PDER-H	●	●	●	–	–	1.2	0.08
APET 103504PDER-F	●	●	●	–	–	0.4	0.025
APET 103504PDFR-S	–	–	–	●	●	0.4	0.025

H : Strong edge F : Ground insert S : For Aluminum
Strong edge type inserts are recommended for use with WRM cutters

■ Parts

Screw	Wrench
	
BFTX02506N	TRD08

Anti-seizure cream SUMI-P included in the package.

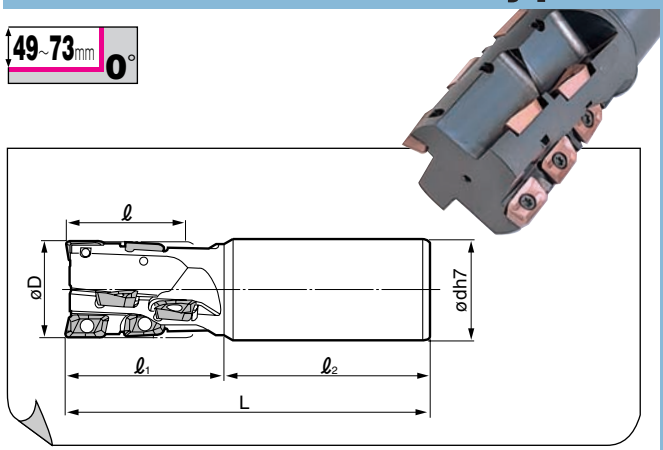
■ Recommended Conditions

øD (mm) \ Material		Carbon steel (ex.S40C～S50C)	Stainless steel (ex.SUS304)	Cast iron (ex.FC200)	Al. alloy (ex.ADC12)
20 ~ 25	V	50-**120**-180	50-**100**-160	50-**120**-180	200-**300**-500
	f	0.05-0.15	0.05-0.12	0.05-0.15	0.10-0.15-0.20
32 ~ 40	V	50-**120**-180	50-**100**-160	50-**120**-180	200-**300**-500
	f	0.05-0.15	0.05-0.12	0.05-0.20	0.10-0.15-0.20
Grade		ACZ330	ACZ350	ACZ310	DL1000(H1)

[V=m/min, f=mm/t] [min.-optimum-max.]

SEC-WaveMill
WRM 30R-E/R-F Type

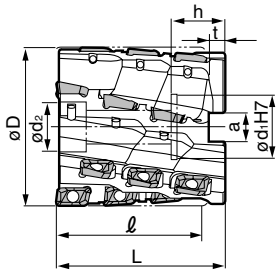
49~73mm 0°



■ Body (WRM30R-E type)

Cat. No.	Stock	Dimensions (mm)						Total teeth	Effective teeth
		øD	ød	ℓ	ℓ1	ℓ2	L		
WRM 30R4049E-S42	●	40	42	49	65	85	150	8	2
WRM 30R5061E-S42	●	50	42	61	75	90	165	10	2

Inserts are not included.



This cutter body can be fitted on a standard face milling arbor (FMC type). For detailed information about the arbor, please refer to arbor maker's catalogue. Use a standard hexagonal-head bolt (JISB1176) to fasten the cutter on to the arbor.

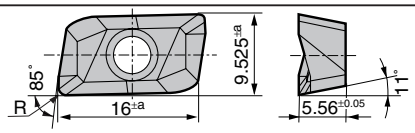
■ Body (WRM30R-F type)

Cat. No.	Stock	Dimensions (mm)								Total teeth	Effective teeth
		øD	ød1	ød2	a	t	ℓ	L	h		
WRM 30R6361F-27	●	63	27	20	12.4	7	61	70	23	10	2
WRM 30R8073F-32	●	80	32	25	14.4	8	73	85	27	18	3

Inserts are not included.

■ Insert

(mm)



Cat. No.	Coated Carbide			Carbide	DLC	Nose R	Tolerance
	ACZ 350	ACZ 330	ACZ 310	H1	DL 1000	R	a
APMT 160508PDER	●	●	●	–	–	0.8	0.08
APMT 160512PDER	●	●	●	–	–	1.2	0.08
APMT 160516PDER	●	●	●	–	–	1.6	0.08
APMT 160508PDER-H	●	●	●	–	–	0.8	0.08
APMT 160512PDER-H	●	●	●	–	–	1.2	0.08
APMT 160516PDER-H	●	●	●	–	–	1.6	0.08
APMT 160520PDER-H *	●	●	●	–	–	2.0	0.08
APMT 160530PDER-H *	●	●	●	–	–	3.0	0.08
APMT 160540PDER-H *	●	●	●	–	–	4.0	0.08
APMT 160550PDER-H *	●	●	●	–	–	5.0	0.08
APMT 160560PDER-H *	●	●	●	–	–	6.0	0.08
APET 160508PDER-F	●	●	●	–	–	0.8	0.025
APET 160504PDFR-S	–	–	–	●	●	0.4	0.025
APET 160508PDFR-S	–	–	–	●	●	0.8	0.025

* cutter body modification is required

■ Parts

Anti-seizure cream SUMI-P included in the package.

Screw	Wrench	Applicable endmill
		
BFTX03584	TRD15	ø40
BFTX03588		over ø50

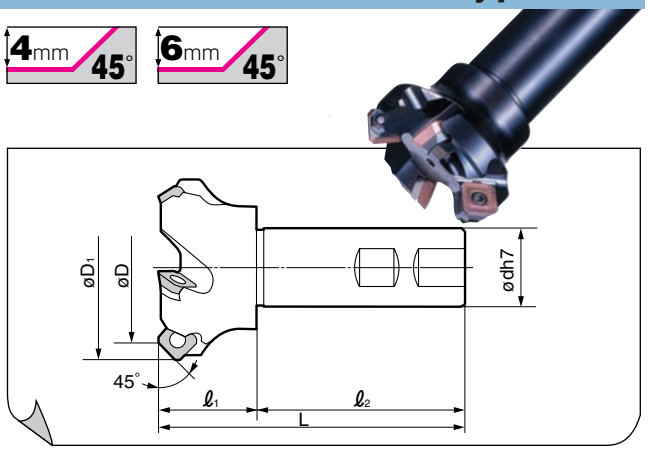
■ Recommended Conditions

øD (mm) \ Material		Carbon steel (ex. S40C～S50C)	Stainless steel (ex.SUS304)	Cast iron (ex.FC200)	Al. alloy (ex.ADC12)
40 ~ 80	V	50-**120**-180	50-**100**-160	50-**120**-180	200-**300**-500
	f	0.05-0.22	0.05-0.15	0.05-0.25	0.10-0.15-0.20
Grade		ACZ330	ACZ350	ACZ310	DL1000(H1)

[V=m/min, f=mm/t] [min.-optimum-max.]

SEC-WaveMill
WGC 3000EW/4000EW Type

4mm 45° 6mm 45°



■ Body (WGC 3000EW Type)

Inserts are not included.

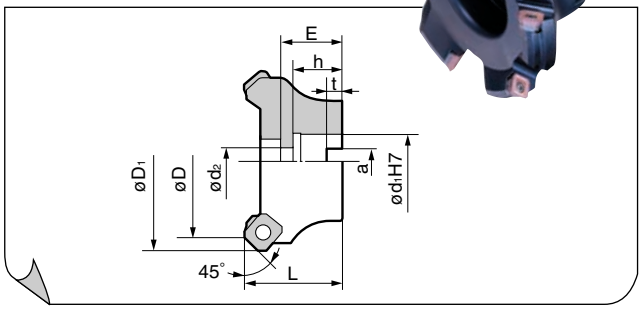
Cat. No.	Stock	Dimensions (mm)						No. of teeth
		øD	øD1	ød	ℓ1	ℓ2	L	
WGC 3020EW	●	20	29	20	40	60	100	2
WGC 3025EW	●	25	34	20	40	60	100	3
WGC 3032EW	●	32	41	32	40	85	125	4
WGC 3040EW	●	40	49	32	40	85	125	4
WGC 3050EW	●	50	59	32	40	85	125	5
WGC 3063EW	●	63	72	32	40	85	125	6

■ Body (WGC 4000EW Type)

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

SEC-WaveMill
WGC 3000/WGC(F)4000RS Type

4mm 45° 6mm 45°



■ Body (WGC 3000RSType)

Inserts are not included.

Cat. No.	Stock	Dimensions (mm)									No. of teeth
		øD	øD1	ød1	ød2	t	a	L	h	E	
WGC 3032RS	●	32	41	16	9	5.6	8.4	40	18	28	4
WGC 3040RS	●	40	49	16	9	5.6	8.4	40	18	28	4
WGC 3050RS	●	50	59	22	11	6.3	10.4	40	20	26	5
WGC 3063RS	●	63	72	22	11	6.3	10.4	40	20	26	6

■ Body (WGC 4000RS Type)

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

■ Body (WGCF 4000RS Type)

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

■ 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		ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	ACZ350	DL1000	A30N	EH520	H1	T250A	DA2200	Fig	Applicable endmill
High Speed/Light Cutting		P			K					N			K N		N		
General Purpose			P M	M	K			P M	M	N	P	K S		P	N		
Roughing			P M	P M		K	K	P M	P M						N		
SEET 0903AGFN-L		●	●	●	●	●			●	●			●		–	4	
SEET 0903AGSN-G		●	●	●	●	●	●	●	●			●		●	–	4	
SEET 0903AGSN-N		●	●	●	●	●	●	●	●					●	–	4	WGC 3000EW type
SEMT 0903AGSN-L		●	●	●	●	●	●	●	●						–	4	WGC 3000RS type
SEMT 0903AGSN-G		●	●	●	●	●	●	●	●		●				–	4	
SEET 13T3AGFN-L		●	●	●	●	●			●	●		●	●		–	5	
SEET 13T3AGSN-G		●	●	●	●	●	●	●	●			●		●	–	5	
SEET 13T3AGSN-N		●	●	●	●	●	●	●	●		●			●	–	5	
SEMT 13T3AGSN-L		●	●	●	●	●	●	●	●						–	5	WGC 4000EW type
SEMT 13T3AGSN-G		●	●	●	●	●	●	●	●		●				–	5	WGC 4000RS type
SEMT 13T3AGSN-H		●	●	●	●	●	●	●	●						–	5	WGCF 4000RS type
NF-SECW 13T3AGTN-N		–	–	–	–	–	–	–	–	–	–	–	–	–	●	5	
NF-SEEW 13T3AGFR-W		–	–	–	–	–	–	–	–	–	–	–	–	–	●	6	
XEEW 13T3AGER-W						●	●							●	–	6	

*Refer to G10 for chipbreaker selection

Fig 4

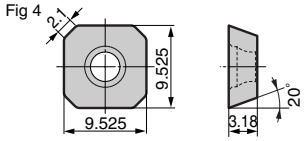


Fig 5

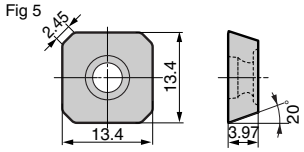
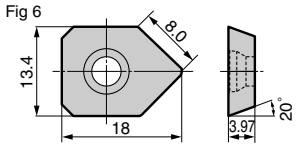


Fig 6



L : Light cut type, G : General type, H : Strong edge type, W : Wiper edge, N : No breaker (Refer to G10 for details)

■ Parts

Seat	Seat Screw	Inserts Screw	Wrench	Wrench	Applicable Endmill
–	–	BFTX0307IP	TRDR10IP	–	WGC 3000EW/RS type
–	–	BFTX03512IP	TRDR15IP	–	WGC 4032EW
WGCS13R	BW0507F	BFTX03512IP	TRDR15IP	LH035	WGC 4000EW/RS type (Except WGC 4032EW) WGCF 4000RS type

■ Recommended Conditions

Applicable Cutter		General Steel	Soft Steel	Stainless Steel	Die Steel	Cast Iron	Non-ferrous Metal
WGC 3000EW/RS	V	150-**200**-250	180-**250**-350	160-**200**-250	100-**150**-200	100-**200**-250	300-**500**-1000
	f	0.1-0.2	0.1-0.25	0.15-0.2	0.15-0.2	0.15-0.2	0.15-0.2
WGC 4000EW/RS WGCF 4000RS	V	150-**200**-250	180-**250**-350	160-**200**-250	100-**150**-200	100-**200**-250	300-**500**-1000
	f	0.1-0.3	0.1-0.4	0.15-0.3	0.15-0.25	0.1-0.3	0.15-0.2

[V=m/min, f=mm/t] [min.-optimum-max.]

● Mark : To be replaced by new items under the ACP / ACK series

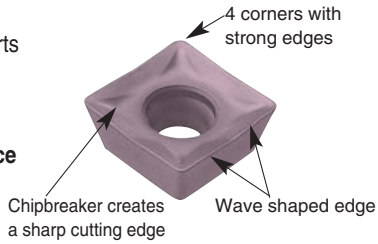
SEC-WaveMill
WFM-E Type

■ Features

SEC-WaveMill WFM-E type is a shank type endmill of WFM series using 4 corner type inserts.
Achieving stable cutting performance with sharp cutting edges and an excellent cutting balance.

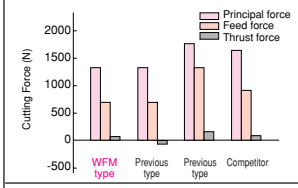
■ Advantages and application

- **Low cost**
  4 cornered, M-class inserts
- **Low cutting resistance**
  Chipbreaker with good sharpness
- **Excellent cutting balance**
  Achieving stable machining with the unique V-shaped wave design.



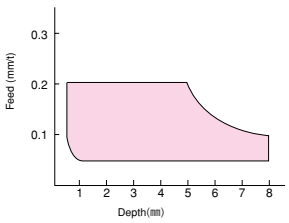
■ Performance

●WFM cutting force comparison



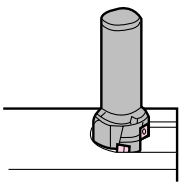
Work : S50C Conditions : V=120m/min
Cutter : φ100mm f=0.2mm/t
d=5mm

●Recommended Range

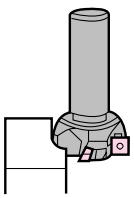


■ Application example

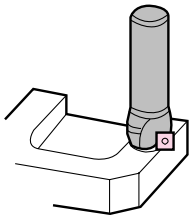
●Slotting



●Shoulder milling

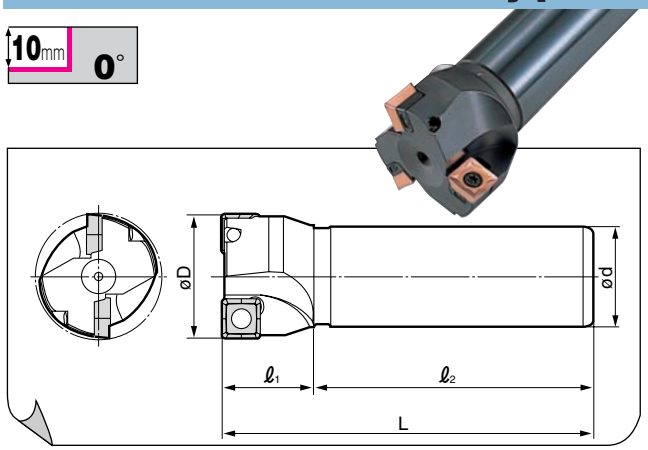


●Contouring



SEC-WaveMill
WFM 4000E/E-C Type

10mm 0°



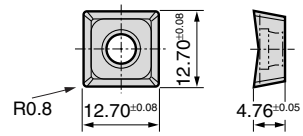
■ Body

Cat. No.	Stock	Dimensions (mm) øD	ød	ℓ1	ℓ2	L	No. of teeth
WFM 4040E	●	40	32	30	90	120	2
WFM 4050E	●	50	32	30	90	120	3
WFM 4063E-C	●	63	32	30	90	120	3
WFM 4063E	●	63	32	30	90	120	4
WFM 4080E	●	80	32	30	90	120	4

Inserts are not included.
-C : Coarse pitch type

■ Insert

(mm)



Cat. No.	Coated Carbide ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	ACZ350	AC230	Carbide A30N	G10E	Cermet T250A
XDMT120408PDEN-G	●	●	●	●	●	●	●	●				
XDMT120408PDER-S		●	●		●	●	●	●				
XDMT120408PDEN-H		●	●		●	●	●	●				
XDMT120408PDEN						●	●	●	●	●	●	●

G : General type、S : Sharp edge、H : Strong edge

■ Parts

Screw	Seat	Set Screw	Wrench	Wrench	Applicable endmill
					
BFTX0409N	—	—	TRD15	—	WFM4040E
BFTX0414	WFMS4R	BT0506	TRD15	LH025	WFM4050E
BFTX0414	WFMS4R	BT0506	TRD15	LH025	WFM4063E-C
BFTX0414	WFMS4R	BT0506	TRD15	LH025	WFM4063E
BFTX0414	WFMS4R	BT0506	TRD15	LH025	WFM4080E

Anti-seizure cream SUMI-P included in the package.

■ Recommended Conditions

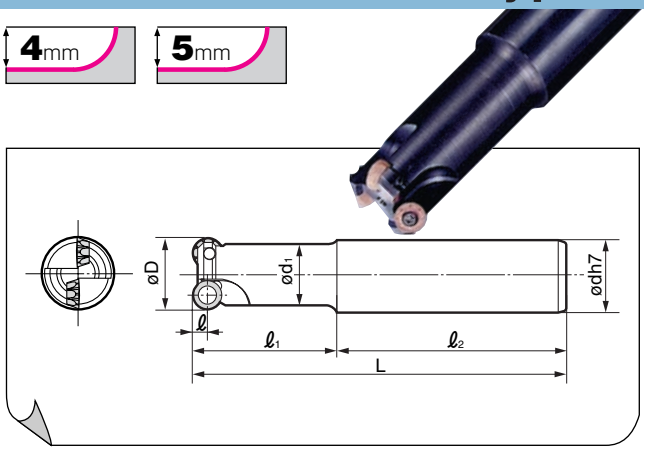
Material / øD (mm)		Carbon steel	Alloy steel	Stainless steel	Cast iron
40 ~ 80	V	200-250	100-200	160-200	100-200
	f	0.1-0.3	01-0.3	0.15-0.3	0.1-0.2
Grade		ACP300,ACP100 ACP200	ACP300,ACP100 ACP200	ACP300	ACK300

[V=m/min、f=mm/t]

▲mark : To be replaced by new item (Please confirm stock availability) ● mark : To be replaced by new items under the ACP / ACK series

SEC-Wave Radius Mill
WRC 0800E/1000E Type

4mm 5mm



■ Body (WRC0800E) Insert: QPMT08 type

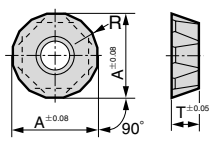
Cat. No.	Stock	Dimensions(mm)							No. of teeth
		øD	ød	ød1	ℓ	ℓ1	ℓ2	L	
WRC 08012ES	●	12	12	10	4	40	70	110	1
WRC 08012EM	●	12	12	10	4	70	80	150	1
WRC 08016ES	●	16	16	14	4	50	70	120	1
WRC 08016EM	●	16	16	14	4	70	80	150	1
WRC 08020ES	●	20	20	18	4	50	80	130	2
WRC 08020EM	●	20	20	18	4	100	80	180	2
WRC 08020EL	●	20	20	18	4	130	120	250	2
WRC 08025ES	●	25	25	21	4	50	80	130	3
WRC 08025EM	●	25	25	21	4	100	80	180	3
WRC 08025EL	●	25	25	21	4	130	120	250	3

■ Body (WRC1000E) Insert: QPMT10 type

Cat. No.	Stock								
WRC 10016ES	●	16	16	14	5	50	70	120	1
WRC 10016EM	●	16	16	14	5	70	80	150	1
WRC 10020ES	●	20	20	18	5	50	80	130	1
WRC 10020EM	●	20	20	18	5	100	80	180	1
WRC 10025ES	●	25	25	21	5	50	80	130	2
WRC 10025EM	●	25	25	21	5	100	80	180	2
WRC 10025EL	●	25	25	21	5	130	120	250	2
WRC 10032ES	●	32	32	28	5	50	80	130	3
WRC 10032EM	●	32	32	28	5	120	80	200	3
WRC 10032EL	●	32	32	28	5	180	120	300	3

Inserts are not included.

■ Insert



Cat. No.	Coated Carbide								Dimensions(mm)		
	ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	ACZ350	A	R	T
QPMT 080330PPEN		●	●			●	●	●	8	3.0	3.18
QPMT 080330PPEN-H		●	●			●	●	▲	8	3.0	3.18
QPMT 10T335PPEN		●	●			●	●	●	10	3.5	3.97
QPMT 10T335PPEN-H		●	●			●	●	●	10	3.5	3.97

H : Strong edge type

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX02505N	TRD08	WRC08012ES/EM
BFTX02506N		Other WRC0800ES/EM/EL types except the above item
BFTX03584	TRD15	WRC1000ES/EM/EL

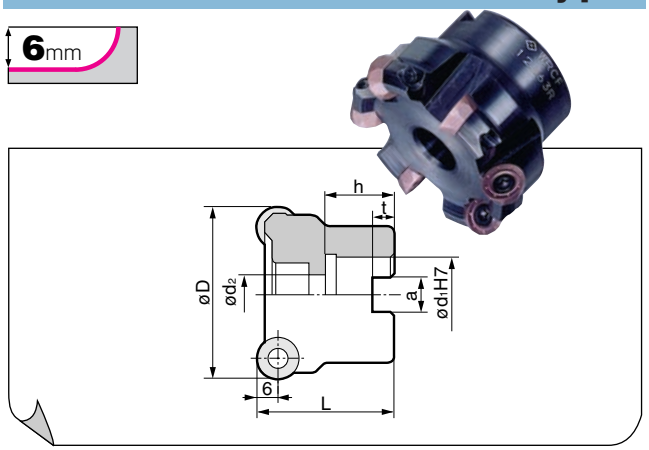
■ Recommended Conditions

øD (mm) \ Material		Carbon steel (ex.S40C～S50C)	Alloy steel (Hardness : Below 40HRC)	Stainless steel (ex.SUS304)	Cast iron (ex.FC250)
12 ～ 32	V	80-**120**-160	60-**100**-140	60-**100**-120	60-**80**-120
	f	0.1-**0.3**-0.4	0.1-**0.2**-0.3	0.1-**0.15**-0.2	0.1-**0.2**-0.3

[V=m/min、f=mm/t] [min.-optimum-max.]

SEC-Wave Radius Mill
WRC 1200/WRCF 1200 Type

6mm



■ Body (WRC1200)

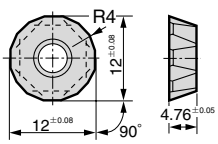
Cat. No.	Stock	Dimensions(mm)							No. of teeth
		øD	ød1	ød2	L	h	a	t	
WRC 12050RS	●	50	22	11	40	20	10.4	6.3	4
WRC 12050R	●	50	22.225	9	40	20	8	5	4
WRC 12063RS	●	63	22	11	40	20	10.4	6.3	5
WRC 12063R	●	63	22.225	9	40	20	8	5	5
WRC 12080R	●	80	25.4	13	50	25	9.5	6	6

■ Body (WRCF1200)

Cat. No.	Stock								
WRCF 12050RS	●	50	22	11	40	20	10.4	6.3	5
WRCF 12050R	●	50	22.225	9	40	20	8	5	5
WRCF 12063RS	●	63	22	11	40	20	10.4	6.3	6
WRCF 12063R	●	63	22.225	9	40	20	8	5	6
WRCF 12080R	●	80	25.4	13	50	25	9.5	6	7

Inserts are not included.

■ Insert



Cat. No.	Coated Carbide							
	ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	ACZ350
QPMT 120440PPEN		●	●			●	●	●
QPMT 120440PPEN-H		●	●			●	●	●

H : Strong edge type

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX0409N	TRD15	the whole series

■ Recommended Conditions

øD (mm) \ Material		Carbon steel (ex.S40C～S50C)	Alloy steel (Hardness : Below 40HRC)	Stainless steel (ex.SUS304)	Cast iron (ex.FC250)
50 ～ 80	V	100-**150**-200	100-**140**-180	80-**160**-180	80-**120**-160
	f	0.2-**0.4**-0.6	0.2-**0.3**-0.4	0.1-**0.2**-0.3	0.1-**0.2**-0.4

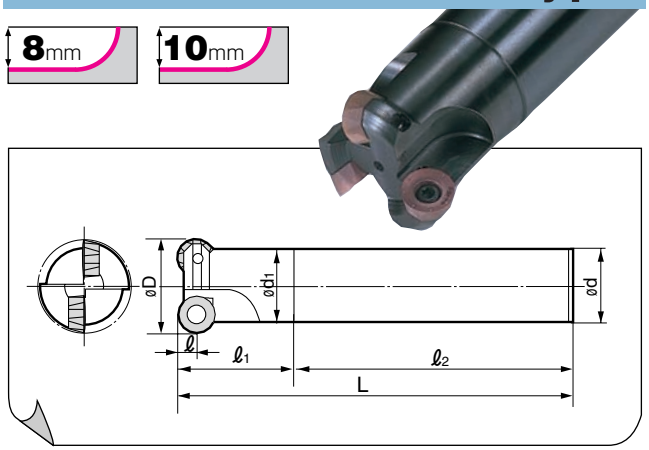
[V=m/min、f=mm/t] [min.-optimum-max.]

SEC-Endmill

● mark : To be replaced by new items under the ACP / ACK series

SEC-Wave Radius Mill
WRC 1600E/2000E Type

8mm 10mm



■ Body (WRC1600E) Insert: QPMT16 type

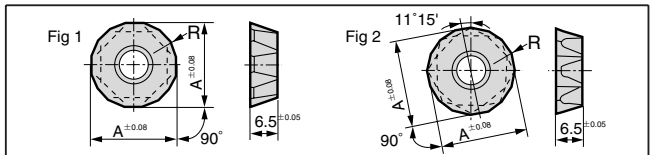
Cat. No.	Stock	Dimensions(mm)							No. of teeth
		øD	ød	ød1	ℓ	ℓ1	ℓ2	L	
WRC 16040ES	●	40	32	31.3	8	50	120	170	2
WRC 16040EM	●	40	32	31.3	8	50	200	250	2
WRC 16040EL	●	40	32	31.3	8	50	300	350	2
WRC 16050ES	●	50	32	40.8	8	50	120	170	3
WRC 16050EM	●	50	32	40.8	8	50	200	250	3
WRC 16050EL	●	50	32	40.8	8	50	300	350	2
WRC 16050ESS42	●	50	42	40.8	8	50	120	170	3
WRC 16050EMS42	●	50	42	40.8	8	50	200	250	3
WRC 16050ELS42	●	50	42	40.8	8	50	300	350	2
WRC 16063EMS42	●	63	42	52.5	8	50	200	250	3
WRC 16063ELS42	●	63	42	52.5	8	50	300	350	2

■ Body (WRC2000E) Insert: QPMT20 type

WRC 20050ESS42	●	50	42	38.6	10	50	120	170	2
WRC 20050EMS42	●	50	42	38.6	10	50	200	250	2
WRC 20050ELS42	●	50	42	38.6	10	50	300	350	2

Inserts are not included.

■ Insert



Cat. No.	Coated Carbide								Dimensions (mm)		Shape
	ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	ACZ350	AC230	A	R	
QPMT 160660PPEN		●	●	●	●	●	●	●	●	16	6.0	Fig 1
QPMT 160660PPEN-H		●	●	●	●	●	●	●		16	6.0	Fig 1
QPMT 160608PPEN		●	●	●	●	●	●	●	●	16	0.8	Fig 1
QPMT 160608PPEN-CP		●	●	●	●	●	●	▲	▲	16	0.8	Fig 2
QPMT 200670PPEN		●	●	●	●	●	●	●	▲	20	7.0	Fig 1
QPMT 200670PPEN-H		●	●	●	●	●	●	●		20	7.0	Fig 1
QPMT 200608PPEN		●	●	●	●	●	●	●	▲	20	0.8	Fig 1
QPMT 200608PPEN-CP		●	●	●	●	●	●	●	▲	20	0.8	Fig 2

H : Strong edge type

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX0511N	TRD20	WRC16040ES/EM/EL
BFTX0513N	TRD20	Other WRC1600ES/EM/EL types except the above item
BFTX0615N	TRD25	WRC2000ES/EM/EL

■ Recommended Conditions

øD (mm) \ Material		Carbon steel (ex.S40C～S50C)	Alloy steel (Hardness : Below 40HRC)	Stainless steel (ex.SUS304)	Cast iron (ex.FC250)
40 ～ 63	V	100-**160**-250	100-**140**-180	80-**160**-180	80-**120**-160
	f	0.2-**0.4**-0.6	0.1-**0.3**-0.4	0.1-**0.2**-0.3	0.1-**0.2**-0.4

[V=m/min, f=mm/t] [min.-optimum-max.]

● mark : To be replaced by new items under the ACP / ACK series

SEC-WaveMill
WAX 3000 Type

New

■ 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 Aluminum alloy.

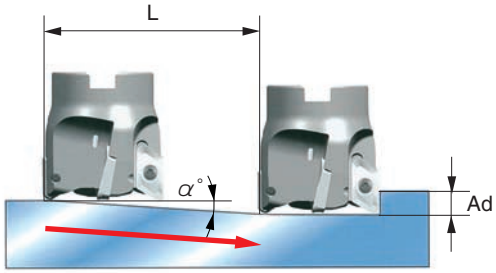
■ Advantages

- ●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 (Ad max) at the maximum ramping angle of that cutter.
Minimum milling length (L) for any depth can be calculated by the equation below:

$$L = \frac{Ad}{\tan \alpha^\circ} \quad (mm)$$



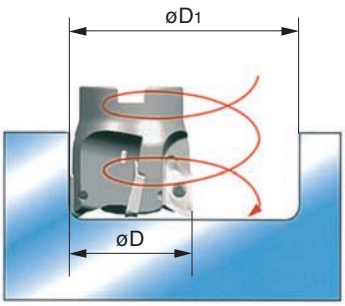
● WAX3000E/EL Type (mm)

Cutter Diameter φD	Max. Ramping Angle α°max.	Max. Depth- Of-Cut Admax.	Min. Milling Distance Lmin.
20	8°	10	72
25	17°	10	33
32	12°	10	47
40	9°	10	64

● WAX3000 Type (mm)

Cutter Diameter φD	Max. Ramping Angle α°max.	Max. Depth- Of-Cut Admax.	Min. Milling Distance Lmin.
50	7°	10	82
63	5°	10	115
80	3°	10	191
100	3°	10	191
125	2°	10	287

■ Helical Milling



● Helical Milling Diameter (mm)

Cutter diameter φD	Milling diameter φD1	
	Minimum diameter	Maximum diameter
20	22	33
25	29	43
32	43	57
40	59	73
50	79	93
63	105	119
80	139	153
100	179	193
125	229	243

■ Maximum Allowable Spindle Speed

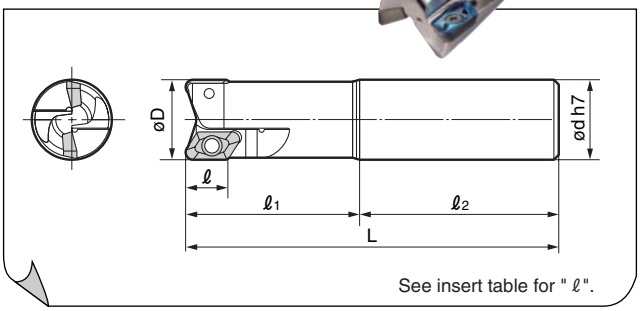
Cutter diameter φD (mm)	Maximum Allowable Spindle Speed	
	S(min-1)	V(m/min)
20	32,000	2,000
25	29,000	2,200
32	25,000	2,500
40	23,000	2,900
50	20,000	3,100
63	18,000	3,500
80	16,000	4,000
100	14,000	4,400
125	13,000	5,100

■ Recommended Conditions

Work material	Aluminum alloy
Cutting Speed V(m/min)	600～1,200
Feedrate f(mm/t)	0.05～0.25

SEC-WaveMill
WAX 3000E/3000EL Type

16~18mm 0°



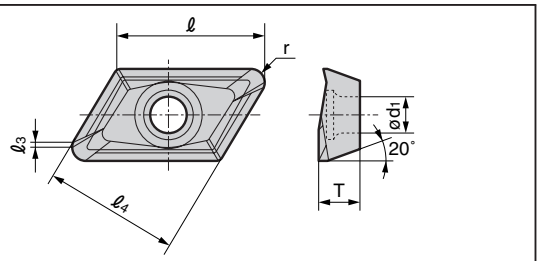
■ Body (For inserts with nose radius 3.2mm and below)

Cat. No.	Stock	Dimensions (mm)					No. of teeth
		øD	ød	L	ℓ1	ℓ2	
WAX 3020E -3.2	●	20	20	130	60	70	1
WAX 3025E -3.2	●	25	25	140	60	80	2
WAX 3025EL-3.2	●	25	25	200	60	140	2
WAX 3032E -3.2	●	32	32	150	70	80	2
WAX 3032EL-3.2	●	32	32	220	70	150	2
WAX 3040E -3.2	●	40	32	160	70	90	3
WAX 3040EL-3.2	●	40	32	220	70	150	3

■ Body (For inserts with nose radius 4.0mm and above)

Cat. No.	Stock	Dimensions (mm)					No. of teeth
		øD	ød	L	ℓ1	ℓ2	
WAX 3020E -4.0	●	20	20	130	60	70	1
WAX 3025E -4.0	●	25	25	140	60	80	2
WAX 3025EL-4.0	●	25	25	200	60	140	2
WAX 3032E -4.0	●	32	32	150	70	80	2
WAX 3032EL-4.0	●	32	32	220	70	150	2
WAX 3040E -4.0	●	40	32	160	70	90	3
WAX 3040EL-4.0	●	40	32	220	70	150	3

■ Insert



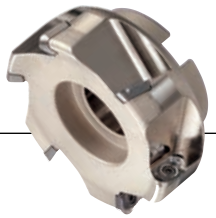
Cat. No.	Carbide	DLC	Dimensions (mm)					
	H1	DL1000	ℓ	ℓ3	ℓ4	r	T	ød1
AECT 160404PEFRA	●	●	18	1.4	16.4	0.4	5	4.4
AECT 160408PEFRA	●	●	18	1.0	16.4	0.8	5	4.4
AECT 160412PEFRA	●	●	18	0.6	16.4	1.2	5	4.4
AECT 160416PEFRA	●	●	17.5	0.5	16.4	1.6	5	4.4
AECT 160420PEFRA	●	●	17.5	0.5	16.4	2.0	5	4.4
AECT 160430PEFRA	●	●	17	0.7	16.4	3.0	5	4.4
AECT 160432PEFRA	●	●	17	0.5	16.4	3.2	5	4.4
AECT 160440PEFRA	●	●	16.5	0.5	16.4	**4.0**	5	4.4
AECT 160450PEFRA	●	●	16	0.4	16.4	**5.0**	5	4.4

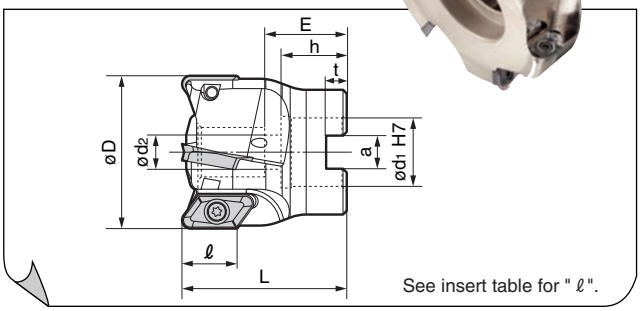
■ Parts

Screw	Wrench	Applicable endmill
		
BFTX0408	TRD15	WAX3000E/EL Type

SEC-WaveMill
WAX 3000 Type

16~18mm 0°





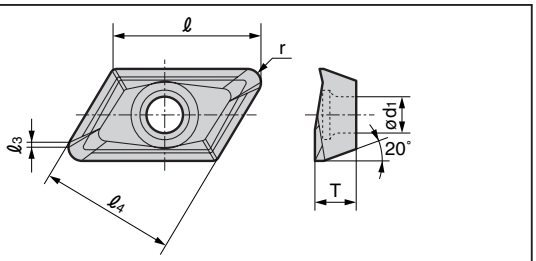
■ Body (For inserts with nose radius 3.2mm and below)

Cat. No.	Stock	Dimensions (mm)								No. of teeth
		øD	ød1	L	ød2	a	t	h	E	
WAX 3050-3.2	●	50	22	50	11	10.4	6.3	21	26	4
WAX 3063-3.2	●	63	22	50	11	10.4	6.3	21	26	5
WAX 3080-3.2	●	80	25.4	50	14	9.5	6	25	31	5
WAX 3100-3.2	●	100	31.75	63	17	12.7	8	32	39	6
WAX 3125-3.2	●	125	38.1	63	21	15.9	10	35	40	7

■ Body (For inserts with nose radius 4.0mm and above)

Cat. No.	Stock	Dimensions (mm)								No. of teeth
		øD	ød1	L	ød2	a	t	h	E	
WAX 3050-4.0	●	50	22	50	11	10.4	6.3	21	26	4
WAX 3063-4.0	●	63	22	50	11	10.4	6.3	21	26	4
WAX 3080-4.0	●	80	25.4	50	14	9.5	6	25	31	5
WAX 3100-4.0	●	100	31.75	63	17	12.7	8	32	39	6
WAX 3125-4.0	●	125	38.1	63	21	15.9	10	35	40	7

■ Insert



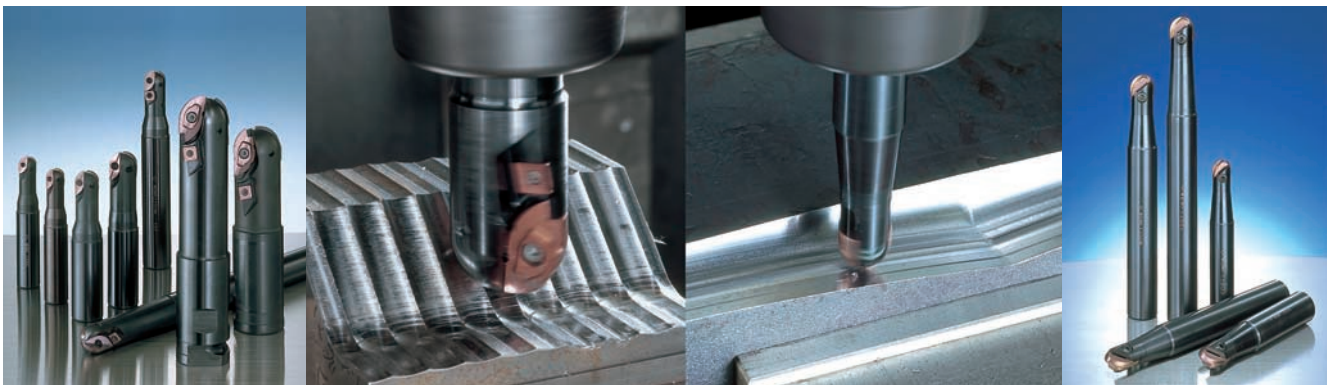
Cat. No.	Carbide	DLC	Dimensions (mm)					
	H1	DL1000	ℓ	ℓ3	ℓ4	r	T	ød1
AECT 160404PEFRA	●	●	18	1.4	16.4	0.4	5	4.4
AECT 160408PEFRA	●	●	18	1.0	16.4	0.8	5	4.4
AECT 160412PEFRA	●	●	18	0.6	16.4	1.2	5	4.4
AECT 160416PEFRA	●	●	17.5	0.5	16.4	1.6	5	4.4
AECT 160420PEFRA	●	●	17.5	0.5	16.4	2.0	5	4.4
AECT 160430PEFRA	●	●	17	0.7	16.4	3.0	5	4.4
AECT 160432PEFRA	●	●	17	0.5	16.4	3.2	5	4.4
AECT 160440PEFRA	●	●	16.5	0.5	16.4	**4.0**	5	4.4
AECT 160450PEFRA	●	●	16	0.4	16.4	**5.0**	5	4.4

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX0408	TRD15	WAX3000 Type

SEC-WaveBall WBMR Type

SEC-WaveBall WBMF Type



■ General Features

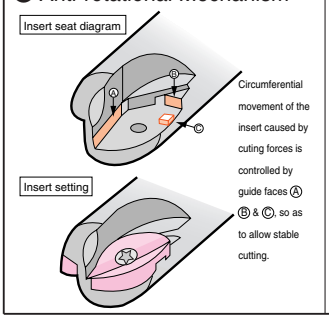
Indexable ballnose endmill series for 3-dimensional roughing to finish copy milling of die molds and machine parts. Roughing series WBMR type is avaliable from φ20～50mm. Finishing series WBMF type is avaliable from φ10～30mm.

3-D Rough Copy Milling

■ Characteristics

- WBMR2000 type／2000L type（φ20～50mm）
  - Wave-shaped, high rake insert design that promotes a sharp cutting edge and low cutting resistance.
  - 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, easier tool management.

● Anti-rotational Mechanism

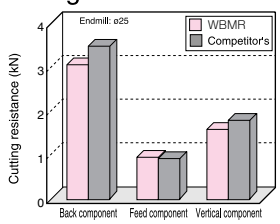


WBMR2000
(φ20～φ50)

WBMR2000L
(φ20～φ50)

■ Performance

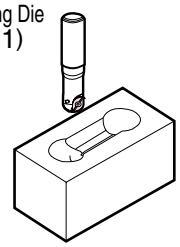
● Cutting resistance



Conditions
(Shoulder milling, down cut)
V=200m/min
f=0.15mm/t
Axial cutting depth : 5mm
Radial sutting depth : 5mm
Work : S50C

■ Application Example

● Cold Molding Die (SKD11)



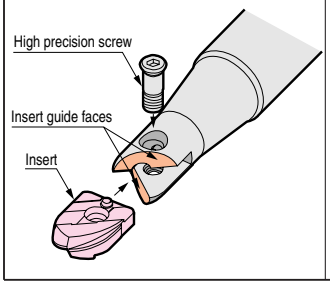
<Results>
Flank wear after continous cutting for seven hours was less than other manufacturer's product. Stable cutting was observed.
WBMR2200S（φ20)
Insert grade ACZ350
Conditions
N=2200min⁻¹
F=500mm/min
Depth of cut : 0.3～2mm
Non-water soluble cutting oil

3-D Finish Copy Milling

■ Characteristics

- WBMF1000 type（φ10～30mm）
  - Simple but precise clamping design.
  - Original large screw design.
  - Sharp cutting edge that produces good finishing.
  - Excellent wear resistance with Super ZX Coat.

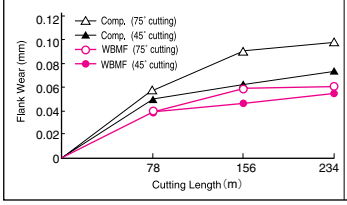
● WBMF Assembly



WBMF1000

■ Performance

● Insert Life

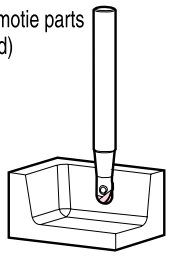


<Results>
WBMF out-performs competitor's in most process including plan profiling with better wear resistance

Work : S50C
Process : plan profiling
(45°,75°)
N=2000min⁻¹
F=2000mm/min
Zp=0.3mm
Pf=0.6mm
Dry

■ Application Example

● Mold for automotie parts (Injection mold)

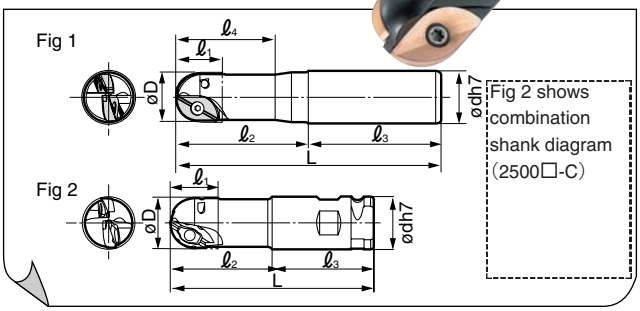


<Results>
Much better finishing as compared to competitor's, polishing time required is reduced by half.

Work : S55C
Process : contouring
N=2500min⁻¹
F=800mm/min
Zp=0.7mm
Overhang=150mm
wet

SEC-WaveBall WBMR 2000 Type

20~47mm



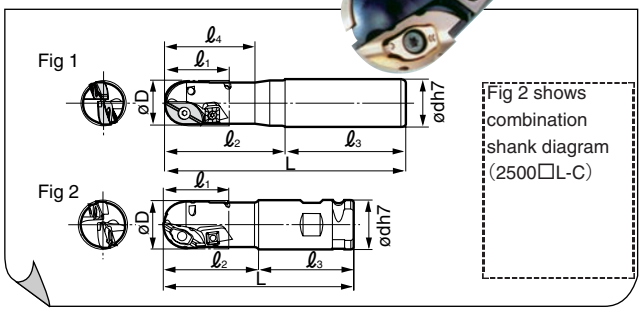
Body

Cat. No.	Stock	Dimensions(mm)							Shape
		øD	ød	ℓ_1	ℓ_2	ℓ_3	ℓ_4	L	
WBMR 2200S	●	20	25	20	60	80	40	140	Fig 1
WBMR 2200M	●	20	25	20	60	140	40	200	Fig 1
WBMR 2200L	●	20	25	20	80	170	40	250	Fig 1
WBMR 2250S	●	25	32	23	70	80	50	150	Fig 1
WBMR 2250M	●	25	32	23	73	147	50	220	Fig 1
WBMR 2250L	●	25	32	23	100	200	50	300	Fig 1
WBMR 2300S	●	30	32	28	80	80	60	160	Fig 1
WBMR 2300M	●	30	32	28	85	155	60	240	Fig 1
WBMR 2300L	●	30	32	28	120	230	60	350	Fig 1
WBMR 2400S	●	40	42	35	100	100	–	200	Fig 1
WBMR 2400M	●	40	42	35	180	100	–	280	Fig 1
WBMR 2400L	●	40	42	35	250	100	–	350	Fig 1
WBMR 2500S	●	50	42	47	100	100	–	200	Fig 1
WBMR 2500M	●	50	42	47	180	100	–	280	Fig 1
WBMR 2500L	●	50	42	47	250	100	–	350	Fig 1
WBMR 2500S-C	●	50	50.8	47	100	100	–	200	Fig 2
WBMR 2500M-C	●	50	50.8	47	180	100	–	280	Fig 2
WBMR 2500L-C	●	50	50.8	47	250	100	–	350	Fig 2

Inserts are not included.

SEC-WaveBall WBMR 2000L Type

30~69mm

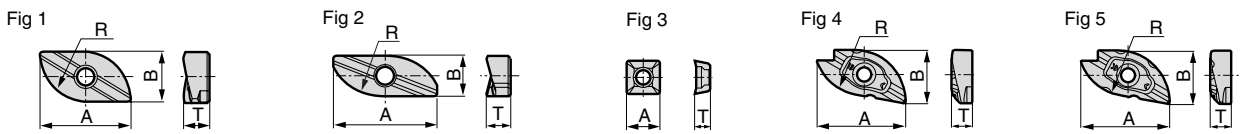


Body

Cat. No.	Stock	Dimensions(mm)							Shape
		øD	ød	ℓ_1	ℓ_2	ℓ_3	ℓ_4	L	
WBMR 2200SL	●	20	25	30	60	80	40	140	Fig 1
WBMR 2200ML	●	20	25	30	60	140	40	200	Fig 1
WBMR 2200LL	●	20	25	30	80	170	40	250	Fig 1
WBMR 2250SL	●	25	32	38	70	80	50	150	Fig 1
WBMR 2250ML	●	25	32	38	73	147	50	220	Fig 1
WBMR 2250LL	●	25	32	38	100	200	50	300	Fig 1
WBMR 2300SL	●	30	32	42	80	80	60	160	Fig 1
WBMR 2300ML	●	30	32	42	85	155	60	240	Fig 1
WBMR 2300LL	●	30	32	42	120	230	60	350	Fig 1
WBMR 2400SL	●	40	42	50	100	100	–	200	Fig 1
WBMR 2400ML	●	40	42	50	180	100	–	280	Fig 1
WBMR 2400LL	●	40	42	50	250	100	–	350	Fig 1
WBMR 2500SL	●	50	42	69	100	100	–	200	Fig 1
WBMR 2500ML	●	50	42	69	180	100	–	280	Fig 1
WBMR 2500LL	●	50	42	69	250	100	–	350	Fig 1
WBMR 2500SL-C	●	50	50.8	69	100	100	–	200	Fig 2
WBMR 2500ML-C	●	50	50.8	69	180	100	–	280	Fig 2
WBMR 2500LL-C	●	50	50.8	69	250	100	–	350	Fig 2

Inserts are not included.

Insert



Cat. No.	Coated Carbide								Dimensions(mm)				Shape	Applicable endmill	Remarks
	ACP 100	ACP 200	ACP 300	ACK 200	ACK 300	ACZ 310	ACZ 330	ACZ 350	A	B	T	R			
ZNMT 1804100-C		●	●		●	●	●	●	18.00	9.76	4.76	10	Fig 1	WBMR 2200	· Main inserts are Fig 1 & 2 · Additional insert Fig 3 for 2200□L
ZNMT 2004100-S		●	●		●	●	●	●	20.00	7.50	4.37	10	Fig 2		
SPMT 070308		●	●		●	●	●	●	7.94	–	3.18	–	Fig 3		
ZNMT 2205125-C		●	●		●	●	●	●	22.50	12.20	5.70	12.5	Fig 1	WBMR 2250	· Main inserts are Fig 1 & 2 · Additional insert Fig 3 for 2250□L
ZNMT 2305125-S		●	●		●	●	●	●	23.00	9.38	5.56	12.5	Fig 2		
SPMT 09T308		●	●		●	●	●	●	9.53	–	3.97	–	Fig 3		
ZNMT 2706150-C		●	●		●	●	●	●	27.00	14.64	6.75	15	Fig 1	WBMR 2300	· Main inserts are Fig 1 & 2 · Additional insert Fig 3 for 2300□L
ZNMT 2806150-S		●	●		●	●	●	●	28.00	11.25	6.35	15	Fig 2		
SPMT 09T308		●	●		●	●	●	●	9.53	–	3.97	–	Fig 3		
ZNMT 3608200		●	●		●	▲	●	▲	36.00	19.5	8.65	20	Fig 4	WBMR 2400	· Main inserts are Fig 4 x 2pcs。 · Additional insert Fig 3 for 2400□L
SPMT 09T308		●	●		●	●	●	●	9.53	–	3.97	–	Fig 3		
ZNMT 4310250		●	●		●	▲	●	●	43.00	25.7	10.15	25	Fig 4	WBMR 2500	· Main inserts use Fig 4 x 2pcs / Fig 5 (nicked) x 2pcs · Additional insert Fig 3 for 2500□L
ZNMT 4310250-N		●	●		●	▲	●	▲	43.00	25.7	10.15	25	Fig 5		
SPMT 120408						●	●	●	12.70	–	4.76	–	Fig 3		

Parts

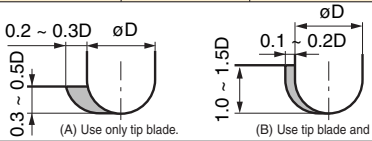
Endmill Cat. number □ indicates S/M/L type	Parts name	Short Edge type	Long Edge type (-□L)		Parts Shape
		Main Insert	Main Insert	Additional Insert	
WBMR2200□(L)	Screw	BFTX0307N			
	Wrench	TRX10			
WBMR2250□(L)	Screw	BFTX0409N			
	Wrench	TRD15			
WBMR2300□(L)	Screw	BFTX0511N	BFTX0407N		
	Wrench	TRD20	TRD15		
WBMR2400□(L)	Screw	BFTX0619N	BFTX0409N		
	Wrench	TRD25	TRD15		
WBMR2500□(L) WBMR2500□(L)-C	Screw	BFTX0619N	BFTX0409N		
	Wrench	TRD25	TRD15		

①TRX ②TRD Anti-seizure cream SUMI-P included in the package.

Recommended Conditions

(2000 type use (A) , 2000L type use (A) or (B))

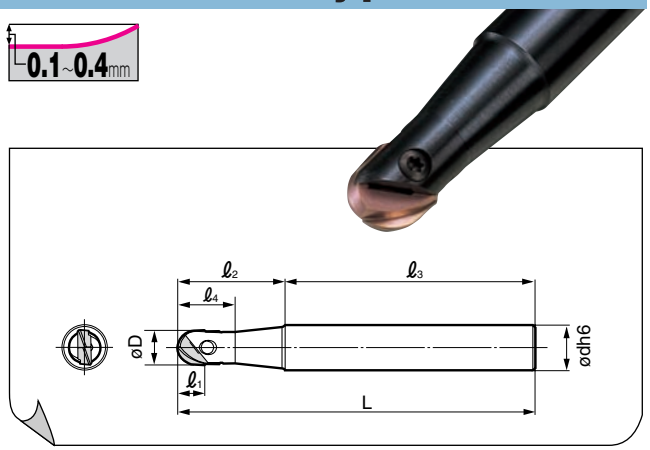
øD	Material	Carbon steel (Below 25HRC)	Alloy steel (Below 45HRC)	Stainless steel Die Steel	Cast iron
(A)	V	100-**150**-200	70-**100**-120	50-**80**-100	100-**120**-150
	f	0.1-**0.2**-0.3	0.1-**0.2**-0.3	0.1-**0.15**-0.2	0.2-**0.3**-0.4
(B)	V	80-**120**-150	50-**80**-100	40-**60**-80	80-**100**-120
	f	0.1-**0.2**-0.3	0.1-**0.2**-0.3	0.1-**0.15**-0.2	0.2-**0.3**-0.4



[V=m/min, f=mm/t] [min.-optimum-max.]

● mark : To be replaced by new items under the ACP / ACK series

SEC-WaveBall
WBMF 1000 Type

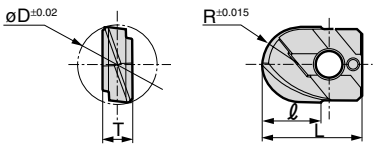


■ Body

Cat. No.	Stock	Dimensions(mm)						
		øD	ød	ℓ1	ℓ2	ℓ3	ℓ4	L
WBMF 1100S	●	10	16	9	30	70	17	100
WBMF 1100M	●	10	16	9	35	95	17	130
WBMF 1100L	●	10	16	9	50	130	17	180
WBMF 1120S	●	12	16	10.5	40	70	19.5	110
WBMF 1120M	●	12	16	10.5	40	110	19.5	150
WBMF 1120L	●	12	16	10.5	60	140	19.5	200
WBMF 1160S	●	16	20	12	50	80	25.5	130
WBMF 1160M	●	16	20	12	50	130	25.5	180
WBMF 1160L	●	16	20	12	70	150	25.5	220
WBMF 1200S	●	20	25	15	60	80	32	140
WBMF 1200M	●	20	25	15	60	140	32	200
WBMF 1200L	●	20	25	15	80	170	32	250
WBMF 1250S	●	25	32	18.5	70	80	36	150
WBMF 1250M	●	25	32	18.5	73	147	36	220
WBMF 1250L	●	25	32	18.5	100	200	36	300
WBMF 1300S	●	30	32	22.5	80	80	43	160
WBMF 1300M	●	30	32	22.5	85	155	43	240
WBMF 1300L	●	30	32	22.5	120	230	43	350

Inserts are not included.

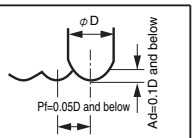
■ Insert



Cat. No.	Coated Carbide		Dimensions(mm)					Applicable endmill
	ACZ120		øD	L	ℓ	T	R	
ZPGU 1551050	●		10	15.6	9	5.1	5.0	WBMF1100
ZPGU 1856060	●		12	18	10.5	5.6	6.0	WBMF1120
ZPGU 2061080	●		16	20.5	12	6.1	8.0	WBMF1160
ZPGU 2471100	●		20	24.5	15	7.1	10.0	WBMF1200
ZPGU 2876125	●		25	28.5	18.5	7.6	12.5	WBMF1250
ZPGU 3486150	●		30	34.4	22.5	8.6	15.0	WBMF1300

■ Parts

Precision Screw	Wrench	Applicable endmill
		
BFTG0408F	TRD15	WBMF1100
BFTG0409F	TRD15	WBMF1120
BFTG0513F	TRD20	WBMF1160
BFTG0617F	TRD25	WBMF1200
BFTG0621F	TRD25	WBMF1250
BFTG0825F	TRD25	WBMF1300



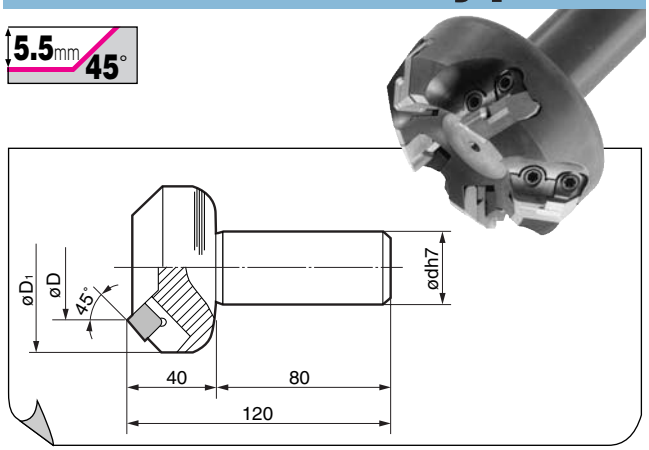
■ Recommended Conditions

øD (mm) \ Material		Carbon steel (Below 25HRC)	Alloy steel (Below 45HRC)	Stainless Steel	Cast iron	
10 ~ 30	V	200-**250**-300	100-**150**-200	50-**80**-100	100-**120**-150	
	f	0.1-**0.2**-0.3	0.1-**0.2**-0.3	0.1-**0.15**-0.2	0.2-**0.3**-0.4	

[V=m/min, f=mm/t] [min.-optimum-max.]

SEC-SUMIUFO Endmill
UFO 4000E Type

5.5mm 45°



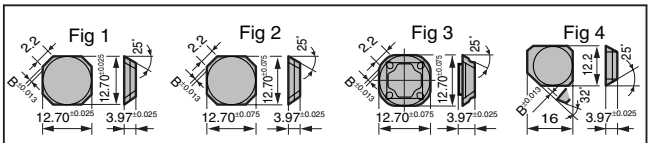
■ Body

Cat. No.	Stock	Dimensions(mm) øD	øD1	ød	No. of teeth	Maximum depth of cut	Axial rake angle	Radial rake angle
UFO 4050ER	●	50	74	32	4	5.5	+27°	–7°
UFO 4050ERS42		50	74	42	4	5.5	+27°	–7°
UFO 4063ER	●	63	86	32	5	5.5	+27°	–7°
UFO 4063ERS42		63	86	42	5	5.5	+27°	–7°
UFO 4080ER	●	80	103	32	6	5.5	+27°	–7°
UFO 4080ERS42		80	103	42	6	5.5	+27°	–7°
UFO 4100ER		100	122	32	7	5.5	+27°	–7°
UFO 4100ERS42		100	122	42	7	5.5	+27°	–7°

Inserts are not included.

■ Insert

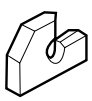
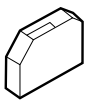
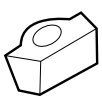
(mm)



Cat. No.	Coated Carbide ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	ACZ350	AC230	Carbide A30N	G10E	H1	H10E	Cermet T250A	Fig
SFEN 12T3AZTN	●	●					○		○	●				●	1
SFEN 12T3AZTN-S										●					1
SFEN 12T3AZTN-W															1
SFEN 12T3AZFN												●			1
SFKN 12T3AZTN	●	●	●				○	○	○	●				●	2
SFKN 12T3AZTN-S										●					2
SFKN 12T3AZTN-W														●	2
SFKN 12T3AZFN				●	●	○					●				2
SFKR 12T3AZEN	●								○	●					3
UW 12500R													●		4

AC211 and EH20Z grades are also available for SFKN 12T3AZFN,
T110A grade is available for UW 12500R.

■ Parts

Locator	Seat	Insert Clamp	Locator Clamp	Double Screw	Wrench
					
UF4KR	UF4SR	UFTWR	UFKWR	WB7-15T	TT25

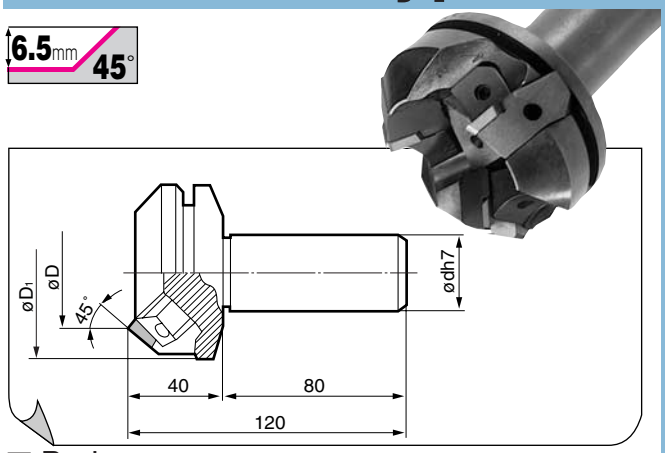
■ Recommended Conditions

Material / øD (mm)		Carbon steel (ex.S40C～S50C)	Alloy steel (Hardness : Below 40HRC)	Cast iron (FC200)	Non-ferrous metal
50 ~ 63	V	100-**125**-200	80-**100**-180	80-**100**-120	80-**160**-250
	f	0.1-**0.2**-0.3	0.1-**0.2**-0.3	0.1-**0.2**-0.3	0.05-**0.15**-0.2
80 ~ 100	V	100-**125**-200	80-**100**-180	80-**100**-120	80-**160**-250
	f	0.1-**0.25**-0.4	0.1-**0.25**-0.4	0.1-**0.25**-0.4	0.05-**0.25**-0.3

[V=m/min, f=mm/t] [min.-optimum-max.]

SEC-Multi Use Endmill
FPE 4000 Type

6.5mm 45°



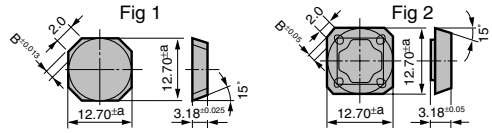
■ Body

Cat. No.	Stock	Dimensions(mm) øD	øD1	ød	No. of teeth	Maximum depth of cut	Axial rake angle	Radial rake angle
FPE 4050R	●	50	72	32	3	6.5	+15°	–3°
FPE 4050RS42		50	72	42	3	6.5	+15°	–3°
FPE 4063R	●	63	85	32	4	6.5	+15°	–3°
FPE 4063RS42		63	85	42	4	6.5	+15°	–3°
FPE 4080R	●	80	100	32	4	6.5	+15°	–3°
FPE 4080RS42		80	100	42	4	6.5	+15°	–3°
FPE 4100R		100	118	32	5	6.5	+15°	–3°
FPE 4100RS42		100	118	42	5	6.5	+15°	–3°

Inserts are not included.

■ Insert

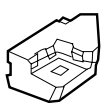
(mm)



Cat. No.	Coated Carbide ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	ACZ350	AC230	Carbide A30N	G10E	Cermet T250A	T1200A	PCD DA2200	Tolerance a	Fig
SDEX 42MT										●		●	●	–	0.025	1
SDKN 42M				●	●	○					●			–	0.075	1
NF-SDKN 42M	–	–	–	–	–	–	–	–	–	–	–	–	–	●	0.075	1
SDKN 42MT	●	●	●				○	○	○	●		●	●	–	0.075	1
SDMR 1203AEEN	●	●							○	●				–	0.05	2
SDMR 1203AETN												●		–	0.05	2

AC211 and EH20Z grades are also available for SDKN42M.

■ Parts

Locator	Clamp	Clamp Screw	Locator Screw	Wrench
				
LFE4R	FEWR	FBX0817	FBH0512	TH040

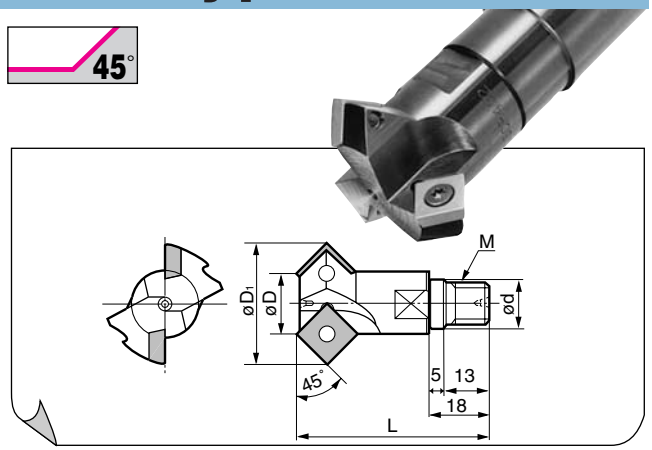
■ Recommended Conditions

Material / øD (mm)		Carbon steel (ex.S40C～S50C)	Alloy steel (Hardness : Below 40HRC)	Cast iron (FC200)
50 ~ 63	V	100-**125**-150	80-**100**-120	80-**100**-120
	f	0.1-**0.2**-0.3	0.1-**0.2**-0.3	0.1-**0.2**-0.4
80 ~ 100	V	100-**125**-150	80-**100**-120	80-**100**-120
	f	0.1-**0.25**-0.4	0.1-**0.25**-0.4	0.1-**0.25**-0.4

[V=m/min, f=mm/t] [min.-optimum-max.]

● mark : To be replaced by new items under the ACP / ACK series

SEC-Chamfering Endmill
SCP Type



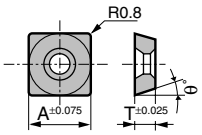
■ Body

Cat. No.	Stock	Dimensions(mm)					No. of teeth	Diameter to be chamfered
		øD	øD1	L	M	ød		
SCP 308	▲	8	20.1	50	M12	14	1	ø 8.5~19.7
SCP 419		19	35.6	56	M12	14	2	ø19.5~35.1
SCP 432	▲	32	48.6	60	M16	20	3	ø32.5~48.1

Inserts are not included.

■ Insert

(mm)



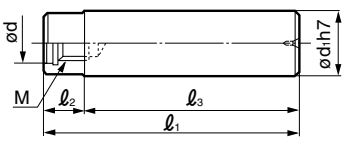
Cat. No.	Coated Carbide		Carbide		Dimensions			Applicable endmill
	ACP200		A30N	G10E	A	T	θ	
SDMA 322				●	9.525	3.18	15°	SCP 308
SDMA 322T			●		9.525	3.18	15°	SCP 308
SPMA 432				●	12.70	4.76	11°	SCP 419
SPMA 432T			●		12.70	4.76	11°	SCP 432

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX 0407N	TRX 10	SCP 308
BFTX 0511N	TRX 20	SCP 419, SCP 432

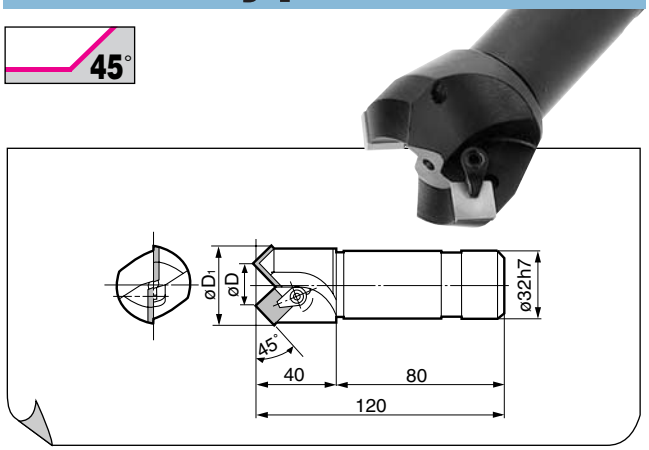
■ Holder

(mm)



Cat. No.	Stock	Dimensions						Applicable endmill
		ød	ød1	M	ℓ1	ℓ2	ℓ3	
SCA20	●	14	20	M12	105	20	85	SCP308 SCP419
SCA32		20	32	M16	130	20	110	SCP432

SEC-Chamfering Endmill
SMC Type



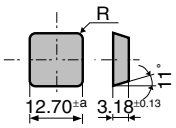
■ Body

Cat. No.	Stock	Dimensions(mm)		No. of teeth	Diameter to be chamfered
		øD	øD1		
SMC 407	▲	7	24.3	1	ø11.0 ~ ø23.8
SMC 420	▲	20	37.3	2	ø21.2 ~ ø36.8
SMC 435	▲	35	52.3	2	ø36.2 ~ ø51.8

Inserts are not included.

■ Insert

(mm)

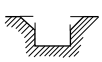


Cat. No.	Coated Carbide			Carbide			Cermet		Dimensions	Tolerance
	ACK200	ACK300	ACZ310	ST20E	A30	G10E	T250A	T1200A	R	a
SPMN 422				●	●	●	●	●	0.8	0.08
SPMN 423	●	●	●		●	●		●	1.2	0.08
SPG 422				●	●	●		●	0.8	0.025

■ Parts

Clamp	Double Screw	Wrench
		
CCM6BR	WB6–16	LH030

■ Application

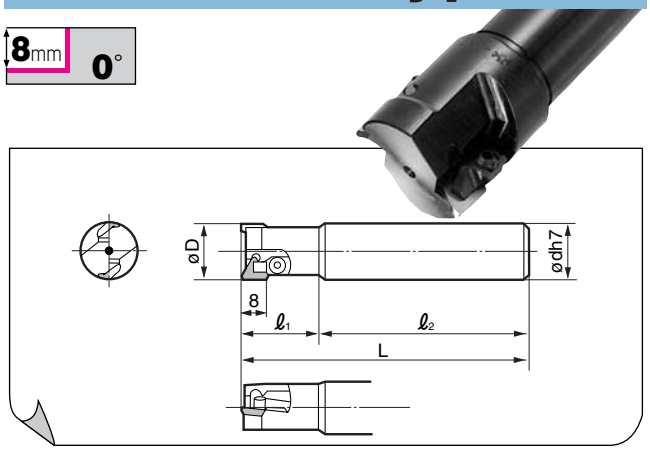
(1) Single side	(2) Double side	(3) Hole chamfering	(4) Stepping	(5) Milling	
				 ①	 ②

SEC-Endmill

▲ mark : To be replaced by new item (Please confirm stock availability) ● mark : To be replaced by new items under the ACP / ACK series

SEC-Multi Use Endmill
CHE 2000 Type

8mm 0°



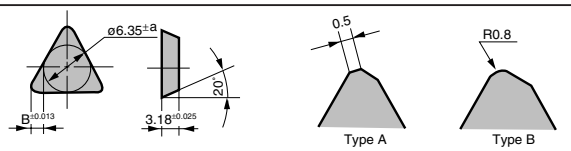
■ Body

Cat. No.	Stock	Dimensions (mm)					No. of teeth	Axial rake angle	Radial rake angle
		øD	ød	ℓ1	ℓ2	L			
CHE 2016R	●	16	16	25	75	100	1	+6°	–3°
CHE 2018R	●	18	20	30	80	110	1	+8°	–2°
CHE 2020R	●	20	20	30	80	110	2	+10°	–2°
CHE 2022R	●	22	20	30	80	110	2	+12°	–1°
CHE 2025R	●	25	25	35	85	120	2	+15°	–1°
CHE 2028R	●	28	25	35	85	120	2	+15°	0°

Inserts are not included.

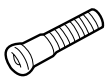
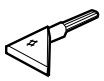
■ Insert

(mm)



Cat. No.	Coated Carbide		Carbide			Cermet	PCD	Tolerance	Edge
	ACP200		A30N	H1	G10E	T250A	DA2200	a	shape
NF-TEEN 22R	–		–	–	–	–	●	0.025	A
TECN 22R				●	●		–	0.025	A
TECN 22TR			●				–	0.025	B
TEKN 22R					●		–	0.075	A
TEKN 22TR			●	●			–	0.075	B

■ Parts

Clamp	Screw	Ring	Wrench
			
CCH4R	BHE0407	ER03	TH025

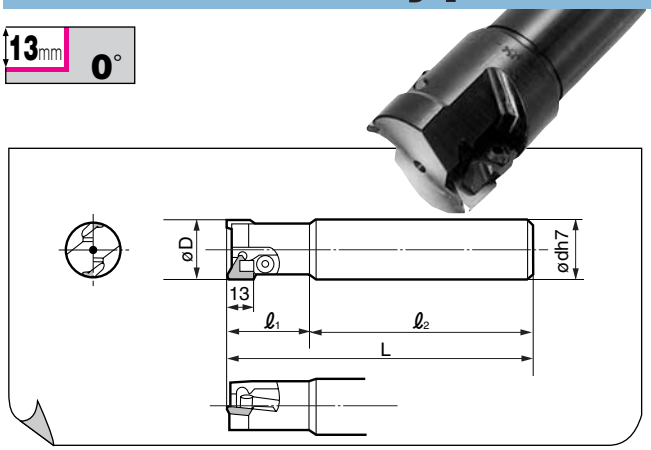
■ Recommended Conditions

Material / øD (mm)		Carbon steel (ex. S40C ~ S50C)	Alloy steel (Hardness : Below 40HRC)	Cast iron (ex.FC200)	Non-ferrous metal
16 ~ 28	V	50-**75**-100	50-**75**-80	40-**70**-100	40-**90**-150
	f	0.03-**0.06**-0.10	0.03-**0.05**-0.06	0.03-**0.10**-0.15	0.03-**0.1**-0.15

[V=m/min, f=mm/t] [min.-optimum-max.]

SEC-Multi Use Endmill
CHE 3000 Type

13mm 0°



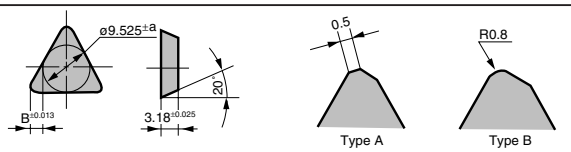
■ Body

Cat. No.	Stock	Dimensions (mm)					No. of teeth	Axial rake angle	Radial rake angle
		øD	ød	ℓ1	ℓ2	L			
CHE 3030R	●	30	32	45	115	160	2	+15°	–3°
CHE 3032R	●	32	32	45	115	160	2	+15°	–2°
CHE 3036R	●	36	32	45	115	160	2	+15°	–1°
CHE 3040R	●	40	32	45	115	160	2	+15°	0°

Inserts are not included.

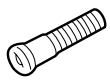
■ Insert

(mm)



Cat. No.	Coated Carbide			Carbide			Cermet	PCD	Tolerance	Edge
	ACP200	ACK200	ACZ330	A30N	H1	G10E	T250A	DA2200	a	shape
NF-TEEN 32R	–	–	–	–	–	–	–	●	0.025	A
TECN 32R					●	●		–	0.025	A
TECN 32TR				●				–	0.025	B
TEKN 32R		●				●		–	0.075	A
TEKN 32TR	●		●	●			●	–	0.075	B

■ Parts

Clamp	Screw	Ring	Wrench
			
CCH5R	BHE0510	ER04	LH030

■ Recommended Conditions

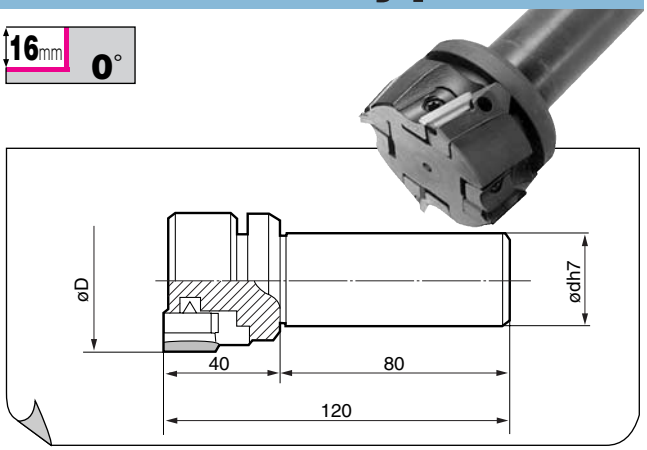
Material / øD (mm)		Carbon steel (ex.S40C ~ S50C)	Alloy steel (Hardness : Below 40HRC)	Cast iron (ex.FC200)	Non-ferrous metal
30 ~ 40	V	60-**90**-120	60-**80**-100	60-**90**-120	60-**130**-200
	f	0.04-**0.08**-0.15	0.04-**0.08**-0.13	0.04-**0.12**-0.20	0.04-**0.12**-0.20

[V=m/min, f=mm/t] [min.-optimum-max.]

● mark : To be replaced by new items under the ACP / ACK series

SEC-Multi Use Endmill
CHE 4000 Type

16mm 0°

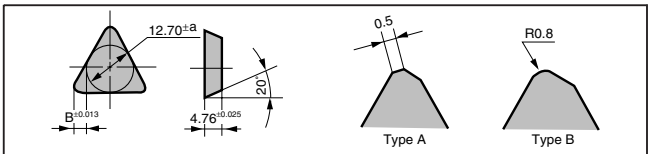


■ Body

Cat. No.	Stock	Dimensions(mm) øD	Dimensions(mm) ød	No. of teeth	Axial rake angle	Radial rake angle	Approach angle
CHE 4050R	●	50	32	3	+15°	+2°	0°
CHE 4063R	●	63	32	4	+15°	+3°	0°
CHE 4080R	●	80	32	4	+15°	+4°	0°
CHE 4080RS42		80	42	4	+15°	+4°	0°
CHE 4100R		100	32	5	+15°	+4°	0°
CHE 4100RS42		100	42	5	+15°	+4°	0°

Inserts are not included.

■ Insert

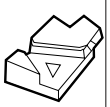
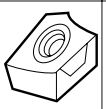


Cat. No.	Coated Carbide ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	ACZ350	AC230	Carbide A30N	G10E	Cermet T250A	PCD DA2200	Edge shape
TEEN 43R											●		–	A
NF-TEEN 43R	–	–	–	–	–	–	–	–	–	–	–	–	●	A
TEEN 43TR	●	●	●				◐	◐	◐	●		●	–	B
TEKN 43R				●	●	◐					●		–	A
TEKN 43TR	●	●	●				◐		◐	●		●	–	B

H1 grade is also available for TEEN43R
AC211 and EH20Z grades are also available for TEKN43R

Tolerance a: TEEN type : 0.025mm
TEKN type : 0.075mm

■ Parts

Locator	Clamp	Double screw	Bolt	Wrench	Applicable endmill
					CHE4050R CHE4063R
LCE4R	CEWR	WB8R-16T	FBH0512	TT27	
					CHE4080R CHE4100R CHE4080RS42 CHE4100RS42
LCH4R	CHWR	FBX0811	FBH0512	TH040	

■ Recommended Conditions

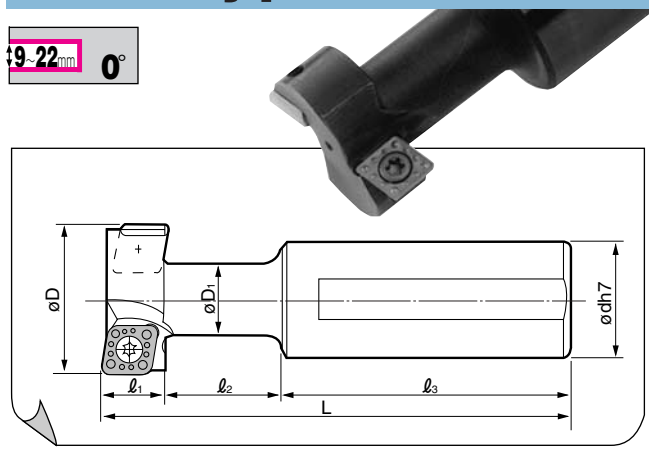
Material / øD (mm)		Carbon steel (ex. S40C ~ S50C)	Alloy steel (Hardness : Below 40HRC)	Cast iron (ex.FC200)	Non-ferrous metal
50 ~ 100	V	125-**100**-150	80-**100**-120	80-**100**-120	200 ~
	f	0.1-**0.15**-0.2	0.1-**0.2**-0.3	0.1-**0.2**-0.3	0.05-**0.2**-0.3

[V=m/min、f=mm/t] [min.-optimum-max.]

● mark : To be replaced by new items under the ACP / ACK series

SEC-Endmill

SEC-T-Slot Endmill
TSE Type

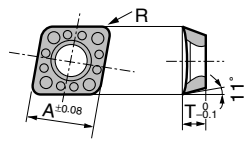


■ Body

Cat. No.	Stock	Dimensions(mm)							No. of teeth
		øD	øD1	ød	ℓ1	ℓ2	ℓ3	L	
TSE 2125	▲	21	10.5	25	9	20	80	109	2
TSE 2525	▲	25	12.5	25	11	21	80	112	2
TSE 3232	▲	32	16.5	32	14	26	80	120	2
TSE 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.

■ Insert



Cat. No.	Coated Carbide	Carbide		Dimensions(mm)			Applicable endmill
	AC630M	A30	G10E	A	T	R	
CPMT 060204N-US	●	●	●	6.35	2.38	0.4	TSE 2125
CPMT 080308N-US	●	●	●	7.938	3.18	0.8	TSE 2525
CPMT 09T308N-US	●	●	●	9.525	3.97	0.8	TSE 3232
CPMH120408N-US	●	●	●	12.7	4.76	0.8	TSE 4032,5032

AC230,T110A grades are also avaliable for TPCH43TR.
AC211,EH20Z grades are also available for TPCH43R.
T12A is also available for TPMN322.

■ Parts

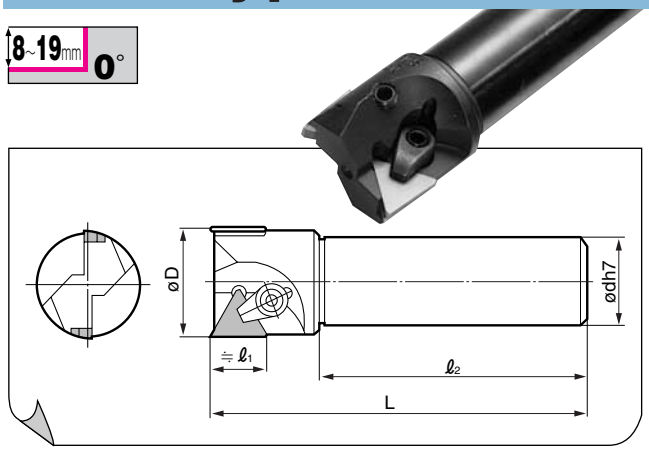
Screw	Wrench	Applicable endmill
		
BFTX02506N	TRX08	TSE2125
BFTX0307N	TRX10	TSE2525
BFTX0407N	TRX15	TSE3232
BFN0511T	TRX20	TSE4032 TSE5032

■ Recommended Conditions

Material / øD (mm)	Carbon steel (ex. S40C～S50C)	Alloy steel (Hardness : Below 40HRC)	Cast iron (FC200)
V	100-**125**-150	60-**80**-100	80-**100**-125
f	0.05-**0.08**-0.1	0.03-**0.05**-0.08	0.05-**0.08**-0.1

[V=m/min、f=mm/t] [min.-optimum-max.]

SEC-Light Endmill
FMS Type

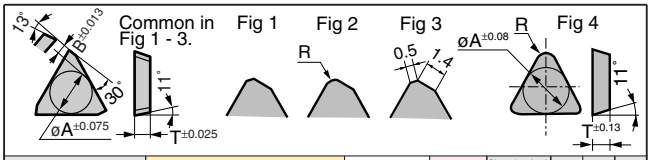


■ Body

Cat. No.	Stock	Dimensions(mm)					No. of teeth	Axial rake angle	Radial rake angle	Applicable endmill
		øD	L	ød	ℓ1	ℓ2				
FMS 216	●	16	70	16	8	50	1	+3°	– 6°	TPKN 22TR
FMS 220	●	20	100	20	8	75	2	+3°	– 4°	
FMS 225	●	25	110	25	8	80	2	+7°	– 4°	
FMS 330	●	30	160	32	13	120	2	+7°	– 4°	TPKN 32TR
FMS 332	●	32	160	32	13	120	2	+7°	– 4°	
FMS 335	●	35	160	32	13	120	2	+7°	– 4°	
FMS 440	●	40	160	32	19	120	2	+7°	– 4°	TPCH 43TR
FMS 450	●	50	160	32	19	120	2	+7°	– 4°	
FMS 460	●	60	160	32	19	120	3	+7°	– 4°	
FMS 440B		40	160	42	19	120	2	+7°	– 4°	

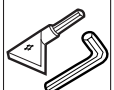
Inserts are not included.

■ Insert



Cat. No.	Coated Carbide							Carbide			Cermet		Dimensions (mm)		R	Fig	Applicable endmill
	ACP100	ACP200	ACP300	ACK200	ACK300	ACZ310	ACZ330	A30N	A30	G10E	T250A	T1200A	A	T			
TPKN 22TR								●			●		6.35	3.18	0.8	2	FMS 200
TPKN 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
TPKN 32R										●			9.525	3.18	–	1	
TPMN 322									●	●		●	9.525	3.18	0.8	4	
TPCH 43TR	●	●	●				●	●			●	●	12.70	4.76	–	3	FMS 400
TPCH 43R				●	●	●				●			12.70	4.76	–	3	
TPMN 432									●	●		●	12.70	4.76	0.8	4	
TPMN 433									●	●			12.70	4.76	1.2	4	

■ Parts

Clamp	Clamp bolt	Shim	Spring pin	Wrench	Applicable endmill
					
CCM5BSL	WB5-10 WB5-12	–	–	TH025	FMS 200
CCM6BL	WB6-16	–	–	LH030	FMS 300
CCM8UL	WB8-20	STPL42	SPP308	LH040	FMS 400

■ Recommended Conditions

Material / øD (mm)		Carbon steel (ex. S40C～S50C)	Alloy steel (Hardness : Below 40HRC)	Cast iron (ex.FC200)	Non-ferrous metal
16 ~ 25	V	50-**75**-100	50-**65**-80	40-**70**-100	40-**90**-150
	f	0.03-**0.06**-0.10	0.03-**0.05**-0.08	0.03-**0.10**-0.15	0.03-**0.1**-0.15
30 ~ 35	V	60-**90**-120	60-**80**-100	60-**90**-120	60-**130**-200
	f	0.04-**0.08**-0.15	0.04-**0.08**-0.13	0.04-**0.12**-0.20	0.04-**0.12**-0.20
40 ~ 60	V	60-**100**-150	60-**90**-120	60-**90**-120	80-**140**-200
	f	0.05-**0.15**-0.20	0.05-**0.12**-0.18	0.05-**0.15**-0.25	0.05-**0.15**-0.25

[V=m/min、f=mm/t] [min.-optimum-max.]

▲ mark : To be replaced by new item (Please confirm stock availability) ● mark : To be replaced by new items under the ACP / ACK series

BRC Type

0.5mm

■ General Features

- 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

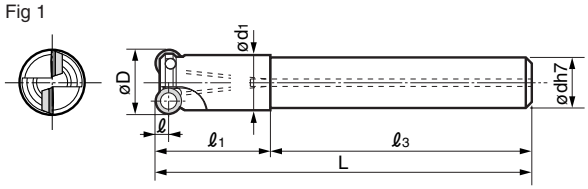


Fig 2

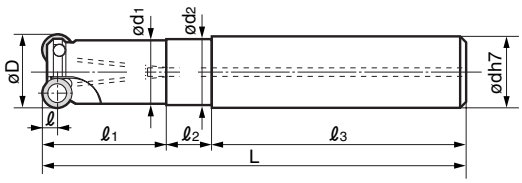
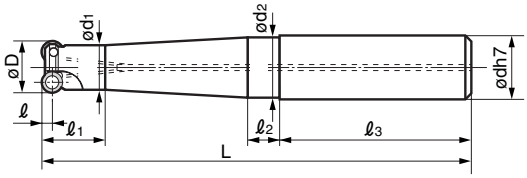


Fig 3



Catalogue No.	Stock	Dimensions (mm)									No. of teeth	Shape	Group No.
		øD	ød	ød1	ød2	ℓ	ℓ1	ℓ2	ℓ3	L			
BRC 071207ES10	●	12	10	11	—	3.5	23	—	52	75	2	Fig 1	
BRC 071207ES12	●	12	12	11	11.5	3.5	22	8	45	75	2	Fig 2	
BRC 071208ES16	●	12	16	11	15.5	3.5	16	8	48	88	2	Fig 3	
BRC 071210ES16	●	12	16	11	15.5	3.5	16	8	48	108	2	Fig 3	❶
BRC 071212ES16	●	12	16	11	15.5	3.5	16	8	48	128	2	Fig 3	
BRC 071507ES12	●	15	12	12.5	—	3.5	16	—	59	75	3	Fig 1	
BRC 071507ES16	●	15	16	12.5	13	3.5	19	11	48	78	3	Fig 2	
BRC 071508ES16	●	15	16	13.5	15.5	3.5	20	8	48	88	2		
BRC 071510ES16	●	15	16	13.5	15.5	3.5	20	8	48	108	2		
BRC 071513ES20	●	15	20	13.5	19.5	3.5	22	8	50	130	2	Fig 3	❷
BRC 071515ES20	●	15	20	13.5	19.5	3.5	22	8	50	150	2		
BRC 071517ES25	●	15	25	13.5	24.5	3.5	22	8	56	176	2		
BRC 102009ES20	●	20	20	17	19.5	5	20	8	50	90	2		
BRC 102011ES20	●	20	20	17	19.5	5	22	8	50	110	2		
BRC 102012ES25	●	20	25	17	24.5	5	24	8	56	136	2	Fig 3	❸
BRC 102015ES25	●	20	25	17	24.5	5	24	8	56	156	2		
BRC 102017ES25	●	20	25	17	24.5	5	24	8	56	176	2		

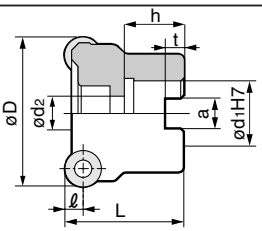
Inserts are not included

■ Recommended Conditions

Work / Grade / Conditions	Steel			Cast Iron
	40 ~ 45HRC	47 ~ 55HRC	58 ~ 62HRC	—
	BN700		BN350	BN700
V (m/min)	200 ~ 800	150 ~ 400	80 ~ 200	300 ~ 1500
f (mm/t)	0.1 ~ 0.4	0.1 ~ 0.3	0.1 ~ 0.2	0.1 ~ 0.4
d (mm)	~ 0.5	~ 0.5	~ 0.5	~ 0.5

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

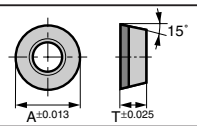
■ Body (Shell Type)



Catalogue No.	Stock	Dimensions (mm)								No. of teeth	Group No.
		øD	ød1	ød2	ℓ	L	h	a	t		
BRC 10042R	●	42	16	9	5	44	20	8	6	6	❸
BRC 10052R	●	52	22	11	5	50	30	10	7	7	
BRC 12042R	●	42	16	9	6	42	20	8	6	5	
BRC 12052R	●	52	22	11	6	52	30	10	7	5	❹
BRC 12066R	●	66	27	13	6	52	30	12	7	6	

Inserts are not included

■ Insert

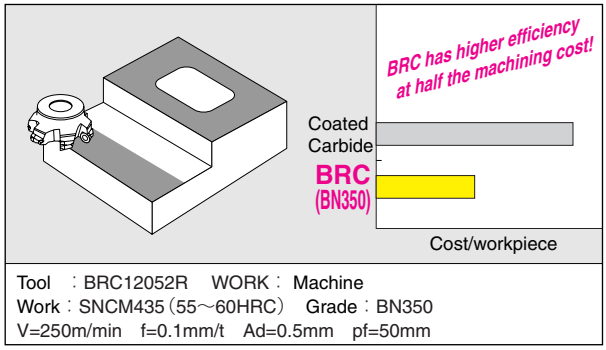


Catalogue No.	Stock		Dimensions (mm)		Applicable Holder Match by group No.
	BN350	BN700	A	T	
RDHX0701M0T	●	●	7	1.99	❶
RDHX0702M0T	●	●	7	2.38	❷
RDHX1003M0T	●	●	10	3.18	❸
RDHX12T3M0T	●	●	12	3.97	❹

■ Parts

Screw	Wrench	Applicable Holder Match by group No.
BFTB025048	TRD07	❶
BFTB02505	TRD07	❷
BFTB035074	TRD15	❸❹

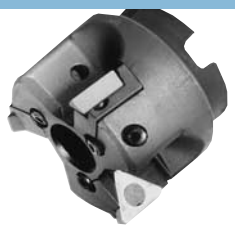
■ Application Example



Tool : BRC12052R WORK : Machine
Work : SNCM435 (55~60HRC) Grade : BN350
V=250m/min f=0.1mm/t Ad=0.5mm pf=50mm

Inserts and Parts for Discontinued Series

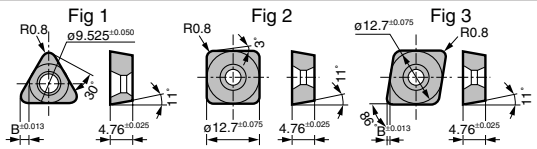
SEC-Shell Endmill
PM Type



* Production of this cutter body has been discontinued.

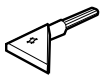
■ Insert

(mm)



Cat. No.	Cermet	Carbide		Fig	Applicable endmill
	T250A	A30N	G10E		
TPKA 33TR	●	●		1	PM 50T
TPKA 33R			●	1	PM 60T
SPKA 43TR	–	●		2	PM 50S
SPKA 43R	–		●	2	PM 60S
MPKA 43TR	–	●		3	PM 50M
MPKA 43R	–		●	3	PM 60M

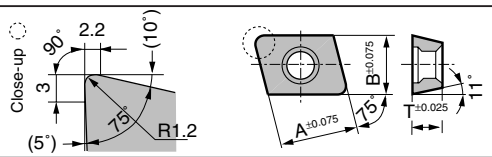
■ Parts

Locator	Pin	Clamping bolt	Bolt	Washer	Wrench
					
LPMTR LPMSR LPMMR	SR134B	BTD0508	BH0304	PW30	TH025

SEC-Multi Use Endmill
HKE Type

* Production of this cutter body has been discontinued.

■ Insert



Cat. No.	Coated Carbide	Carbide	Dimensions (mm)			Applicable endmill
	ACP200	A30N	A	B	T	
EPMW 433T		●	12.70	9.525	4.76	HKE1025
EPMW 433			12.70	9.525	4.76	HKE2030
EPMW 543T		●	15.875	12.70	6.35	HKE2040
EPMW 543			15.875	12.70	6.35	HKE2050

■ Parts

Screw	Wrench	Applicable endmill
		
BFTX0409N	TRX15	HKE1025,HKE2030
BFTX0511N	TRX20	HKE1040,HKE2050