G–J

SUMITOMO
CARBIDE - CBN - DIAMOND

22|23

MILLING TOOLS

Milling Cutters | Indexable Endmills | Solid Carbide Endmills

SUMITOMO ELECTRIC GROUP

Milling Cutters

G1–G86

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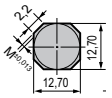
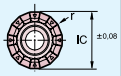
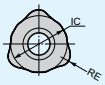
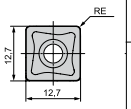
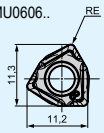
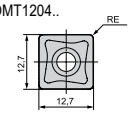
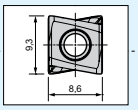
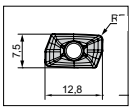
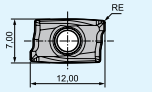
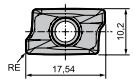
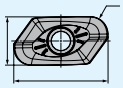
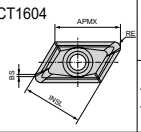
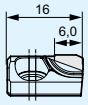
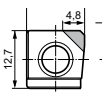
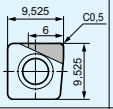
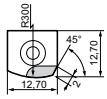
Selection Guide

Application	Cutter Type	Series	Insert Type	Approach Angle / Max. Depth of Cut (mm)	Cutter Diameter (mm)	Application: Face Milling – General Purpose	Face Milling – Finishing	Face Milling – High Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile Finishing	Work Material: P – Carbon Steel / Alloy Steel	P – Tempered Steel / Die Steel	M – Stainless Steel	K – Cast Iron / Ductile Cast Iron	N – Non-Ferrous Metal	N – Aluminium Alloy	S – Ti Alloy / Heat Resistant Alloy	H – Hardened Steel HRC 45 ~ 55	Ref. Page
Face Milling	DGC	DGC (-M/F) 13000RS	SNM/EU 13T6.. ONM/EU 05T6..	SNMU 6 mm 45° ONMU 3 mm 45°	40–250	◎										◎	◎	◎	◎	◎	◎	○		G8
	WGX	WGX (-M/F) 13000RS	SEE/MT 13T3..	6 mm 45°	40–250	◎	◎									◎	◎	◎	◎	◎	◎	○		G10
	UFO	UFO (-F) 4000 RS	SFK-N/R12T3.., SFK-N1504... 	5 mm 45°	50–315	○	○									○	○	○	○	○	○	○		G12
		UFO 5000 RS		7 mm 45°	80–315																			G13
	DNX	DNX (-F) 12000RS	SNMT 1205..	8 mm 65°	80–160	○	○									○			◎					G14
Radius Milling	RSX	RSX (-F) 10000RS	RDET10T3.. RDET1204..	5 mm	40–52	◎		○	◎	○	◎			◎		◎	◎	◎	◎			◎		G20
		RSX (-F) 12000RS		6 mm	40–100																			
		RSX (-F) 16000RS		8 mm	63–160																			
		RSX (-F) 20000RS	RDET1606.. RDET2006..	10 mm	80–160																			
Multi-Purpose	WRCX	WRCX (-F/X) 12000RS 16000RS 20000RS	QPMT1204../1606../2006 QPET1204../1606.. 	6–10 mm	40–160	◎		○	◎	○	◎			◎		◎	◎	◎	◎		◎			G17
High Feed Milling	DMSW New	DMSW08000R(S)	WNMU0807..	3 mm 15°	50–160			◎	○	○	○					◎	◎	○	◎				○	G66
	MSX	MSX 08000RS 12000RS 14000RS	WDMT0603../0804../1205.. 1406.. 	1,5–2,5mm 20°	40–100			◎	○	○	○					◎	◎	◎	◎				○	G67
	WFXH	WFXH 08000RS	SOMT0803.., SOMT1204.. 	1,5 mm 15°	40–63			◎	○	○	○					◎	◎	◎	◎			○	○	G70
		WFXH 12000RS		2,5 mm 15°	50–63																			G71
Shoulder Milling	DFC	DFC (-M/F) 09000RS	XNMU0606.. 	6 mm 90°	50–200	◎	○		◎	○						◎	◎	○	◎			○		G24
	WFX	WFX (-F/-M) 08000RS WFX (-F) 12000 RS	SOMT080.. SOMT1204.. 	6 mm 90°	40–100	○	◎		◎	○						◎	◎	◎	◎	◎	◎	○		G28
				10 mm 90°	50–160																			G29

◎ : Best
○ : Suitable

Selection Guide

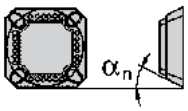
Application	Cutter Type	Series	Insert Type	Approach Angle / Max. Depth of Cut (mm)	Cutter Diameter (mm)	Application: Face Milling: General Purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile Finishing	Work Material: P: Carbon Steel / Alloy Steel	P: Tempered Steel / Die Steel	M: Stainless Steel	K: Cast Iron / Ductile Cast Iron	N: Non-Ferrous Metal	N: Aluminium Alloy	S: Ti Alloy / Heat Resistant Alloy	H: Hardened Steel HRC 45 ~ 55	Ref. Page
Shoulder Milling	TSX	TSX (-F) 08000RS	LNEX0804..,LNEX1306.. 	8 mm 90°	40–80	◎	◎		◎	○						◎	◎	◎	◎			◎		G34 G35 G36 G37
		TSXM13000RS TSX F13000RS		12 mm 90°	40–315 40–160																			
	TSXR New	TSXR 08000RS		34-60 mm 90°	32–63	○			◎							◎	◎	◎	◎			◎		G38 G39
		TSXR 13000RS		41-60 mm 90°	40–125																			
	WEZ	WEZ 11000R(S)	AOMT11T3.., AOET11T3.. AOMT1705.., AOET1705.. 	10 mm 90°	40–100	◎	◎		◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		G48 G50
		WEZ 17000R(S)		15 mm 90°	40–160																			
	WEZR New	WEZR 11000R(S)		44-63 mm 90°	40–50	◎	◎		◎	◎	◎					◎	◎	◎	◎	◎	◎	◎		G54 G56
		WEZR 17000R(S)		29-57 mm 90°	40–80																			
	WEX	WEX 1000F	AXMT0602.. AXMT1235..AXMT1705.. 	5 mm 90°	32–63	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎		G58
		WEX 2000F		10 mm 90°	40–63																			
		WEX 3000F		14 mm 90°	40–125																			
	WRX	WRX 2000F	AXMT12350../1705.. 	18-36 mm 90°	40–50	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎		G59
		WRX 3000F		27-53 mm 90°	50–100																			
	MTIX New	MTIX16000RS	XOMT1605.. 	13 mm 90°	50–63	◎	◎		◎	◎	◎							○				◎		G61
Aluminium Alloy and Non-Ferrous Metals	WAX	WAX 3000 RS	AECT1604 	16–18 mm 90°	50–125	○			◎	◎	◎			◎						○	◎			G72 G73
		WAX 4000 RS		22–24 mm 90°																				
	ANX	ANXS 16000R(S)	ANB 1600R-L 	3 mm 90°	40–125	○	◎	◎	◎											◎	◎			G80 G78
		ANXA 16000R(S)			80–160																			
	RF	RF 4000 RS	SNEW1204.. SDET1204.. 	3 mm 90°	80–125	◎	◎													○	◎			G82
	SRF	SRF 50/63 RS	SNEW09T3.. 	5 mm 90°	30–63	◎	◎		○											○	◎			G83
High Speed Finishing of Cast Iron	FMU	FMU 4000 RS	SNEW1203.. 	0,5 mm 90°	80–100		◎												◎					G85

Milling Cutters

ISO Identification Table

Insert shape			
C	80°	A	85°
D	55°	B	82°
E	75°	K	55°
F	50°	H	120°
V	35°	O	135°
R	-	P	108°
S	90°	L	90°
T	60°	M	86°
W	80°		

Clearance angle	
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°

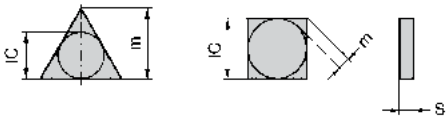


O Other clearance angle with specific description

Insert type			
A		W	
G		T	
M			
N			
R		X	Non standard

S E M T

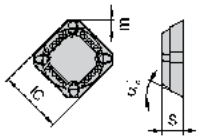
Tolerances



IC: theoretical diameter of inscribed circle
m: nose height
s: thickness

Class	Tolerances (mm)		
	m	IC	s
A	±0,005	±0,025	±0,025
F	±0,005	±0,013	±0,025
C	±0,013	±0,025	±0,025
H	±0,013	±0,013	±0,025
E	±0,025	±0,025	±0,025
G	±0,025	±0,025	±0,13

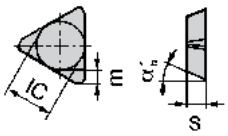
Class	Tolerances (mm)		
	m	IC	s
J	±0,005	±0,05 – ±0,13*	±0,025
K	±0,013	±0,05 – ±0,13*	±0,025
L	±0,025	±0,05 – ±0,13*	±0,025
M	±0,08~ ±0,18*)	±0,05 – ±0,13*	±0,13
N	±0,08~ ±0,18*)	±0,05 – ±0,13*	±0,025
U	±0,13~ ±0,38*)	±0,08 – ±0,25*	±0,13



*) The tolerance is dependent upon the insert size of IC. See tables below.

Tolerance class for dimension m

m	S	T	C	W	V	D
6,35	±0,08				-	±0,11
9,525	±0,08				±0,13	±0,11
12,7	±0,13					±0,15
15,875	±0,15					±0,18
19,05	±0,15					±0,18
25,4	±0,18					

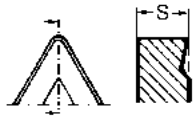


Tolerance class for dimension IC

IC	S	T	C	D	V	W	R
6,35	±0,05						
9,525	±0,05						±0,05
12,7	±0,08						±0,08
15,875	±0,10						±0,10
19,05	±0,10						±0,10
25,4	±0,13						±0,10

ISO Identification Table

Thickness

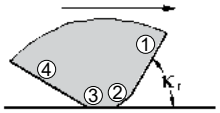


02	s = 2,38 mm
03	s = 3,18
T3	**s = 3,97**
04	s = 4,76
05	s = 5,56
06	s = 6,35
07	s = 7,94
09	s = 9,52

Corner geometry with wiper flat

Entering angle

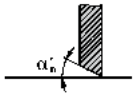
Feed direction



A	**45°**
D	60°
E	75°
F	85°
P	90°
Z -	Others

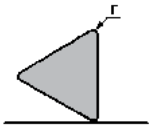
1. Major cutting edge
2. Chamfered corner
3. Wiper flat
4. Side cutting edge

Clearance angle on wiper flat



A	3°
B	5°
C	7°
D	15°
E	20°
F	**25°**
G	30°
N	0°
P	11°
Z -	**Others**

Radius



02	r = 0,2 mm
04	r = 0,4
08	r = 0,8
12	r = 1,2
16	r = 1,6
20	r = 2,0
24	r = 2,4

M0 - Round insert (metric)
00 - Round insert (inch)

1 3 T 3 A G S R

Insert size

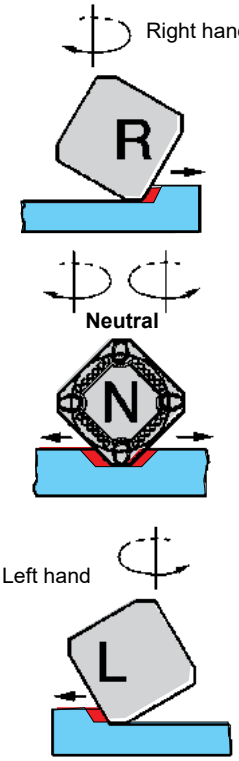
Symbol and cutting edge length (mm)

Insert type / IC d (mm)	C	D	R	S	T	V	W
3,97					**06** (6,9)		
4,76					**08** (8,2)		
5,0			**05** (5,0)				
5,56					**09** (9,6)	**09** (9,7)	**03** (3,8)
6,0			**06** (6,0)				
6,35	**06** (6,4)	**07** (7,7)		**06** (6,35)	**11** (11,0)	**11** (11,1)	**04** (4,3)
7,94	**08** (8,0)			**07** (7,94)			**05** (5,4)
8,0			**08** (8,0)				
9,525	**09** (9,7)	**11** (11,6)	**09** (9,525)	**09** (9,525)	**16** (16,5)	**16** (16,6)	**06** (6,5)
10			**10** (10,0)				
12			**12** (12,0)				
12,7	**12** (12,9)	**15** (15,5)	**12** (12,7)	**12** (12,7)	**22** (22,0)		**08** (8,7)
15,875	**16** (16,1)	**19** (19,4)	**15** (15,875)	**15** (15,875)	**27** (27,5)		**10** (10,9)
16			**16** (16,0)				
19,05	**19** (19,3)		**19** (19,05)	**19** (19,05)	**33** (33,0)		
20			**20** (20,0)				
25			**25** (25,0)				
25,4			**25** (25,4)	**25** (25,4)			
31,75			**31** (31,75)	**31** (31,75)			
32			**32** (32,0)				

Cutting edge condition

F	Sharp
E	Rounded
T	Chamfered
S	Rounded and chamfered

Feed direction



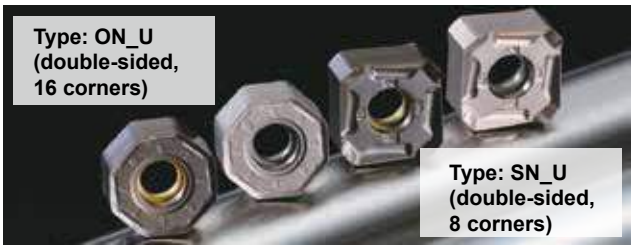
DGC (M/F) Type

Expansion

General Features

Sumi Dual Mill DGC type utilizes double-sided inserts for excellent economy. This is a general-purpose cutter featuring high cutting edge strength for high efficiency milling and low-burr chipbreaker design that provides high qualitiy machined surface.

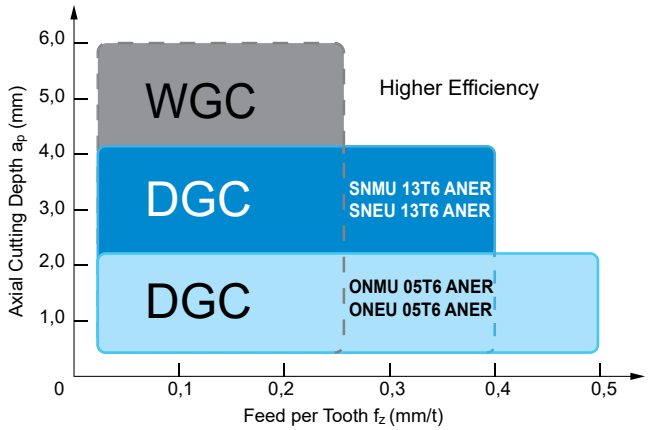
The DGC type insert lineup includes double-sided SNMU / SNEU and ONMU / ONEU types.
Up to 16 corners can be used for improved economy.



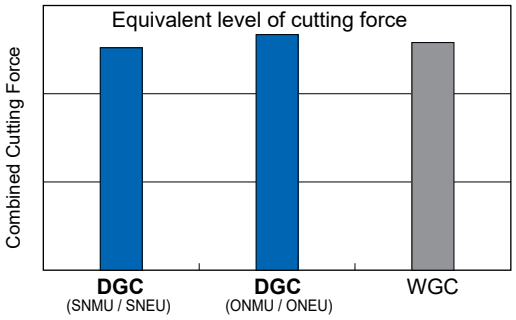
Characteristics

- Same cutting performance as single-sided inserts plus superior economy.
- Achieves level of cutting edge sharpness and machined surface quality equivalent to single-sided cutter at a maximum cutting depth of $a_p \leq 3$ mm.

Recommended Cutting Conditions for General Steel Milling



Cutting Force Comparison



Work Material:	34CrMo4
Tool:	Ø 100
Cutting Data:	v_c=200m/min, f_z=0,3mm/t, a_p=3mm, a_e=85mm

Dual-Purpose Body

Two types of inserts can be used with a single body depending on milling application to help reduce costs.
Stronger than single-sided cutters.

SNMU
SNEU

– first recommendation
– economical double-sided design offers 8 cutting edges with SN_U inserts
– maximum depth of cut: a_p = 6 mm

+

shim to protect cutter body

+

ONMU
ONEU

– double-sided design with 16 corners for improved economy
– maximum depth of cut: a_p = 3 mm

max. a_p = 6 mm
8 corners use

Use two types of inserts for different applications.

max. a_p = 3 mm
16 corners use

Line-up

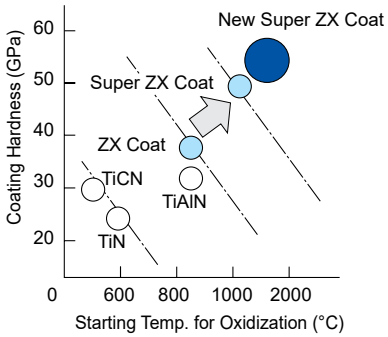
Choose a tool that fits your application from a comprehensive line-up

Cat. No	DGC 13000 RS	DGCM 13000 RS	DGCF 13000 RS	DGC 13000 EW
Type	Standard pitch	Medium pitch	Fine pitch	Endmill type
Cutter Diameter	Ø 40 mm – Ø 250 mm	Ø 50 mm – Ø 250 mm	Ø 50 mm – Ø 250 mm	Ø 40 mm – Ø 63 mm
Cutting Edges	3–10	4–14	5–18	3–4
Shape				→ H6

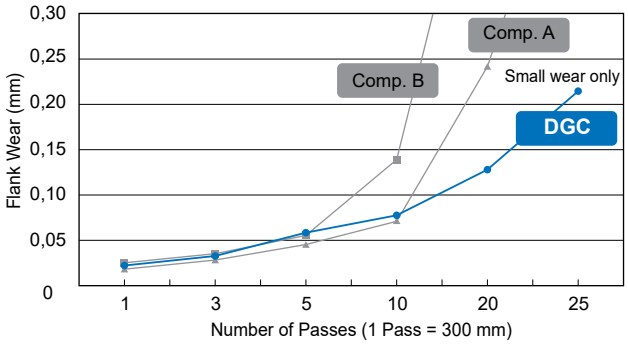
High Reliability

Employs New Super ZX Coating, a multi-layer PVD coating grade and CVD coating grade with enhanced coating strength provided by newly developed stress control technology.
Improved run-out precision reduces tool life deviation to achieve highly reliable tool life.

Multi-layer PVD Coating



Wear Resistance



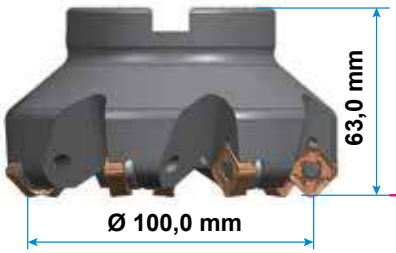
Work Material:
34CrMo4

Tool:
Ø 100 mm

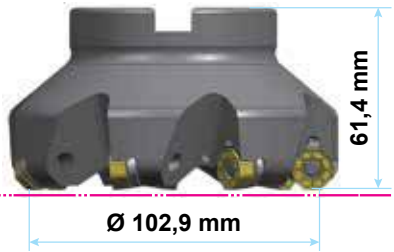
Cutting Data:
v_c = 200 m/min
f_z = 0,15mm/t
a_p = 2 mm
a_e = 85 mm

Cutter Diameter and Cutter Body Height

Insert: SN_U 13T6 ANER (square)



Insert: ON_U 05T6 ANER (octagonal)



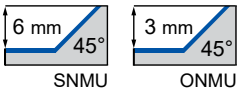
Example: DC = 100mm	Number of Cutting Edges	Tool Diameter (mm)	Cutter Height (mm)	Max. Depth of Cut (mm)
SNMU/SNEU	8	100,0	63,0	6,0
ONMU/ONEU	16	102,9	61,4	3,0

Square inserts (SNMU/SNEU) and octagonal inserts (ONMU/ONEU) can be used interchangeably on the same body.
Using these inserts the cutter will have different cutter diameter and cutter body height.

DGC (M/F) Type

General Milling of Steel and Cast Iron

Rake Angle	Radial	–10°
	Axial	–5°



■ Body – Shell type

Fig. 1

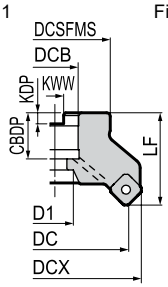


Fig. 2

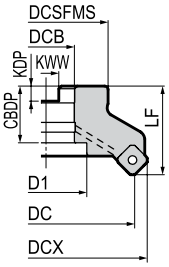


Fig. 3

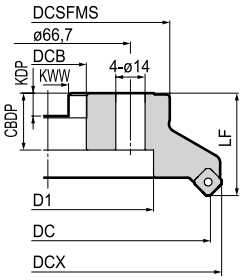
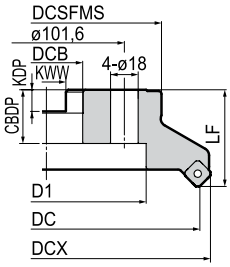


Fig. 4



Cutter body Ø DC ≥ 160 mm: no inner coolant

■ Body

● Type: DGC, Standard Pitch

Cat. No.	Stock	Dimension (mm)									No. of Teeth	Weight (kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	D1	KWW	KDP	CBDP			
DGC 13040 RS	❍	40 (42,90)	54	36	40 (38,44)	16	13,5	8,4	5,6	18	3	0,3	1
13050 RS	●	50 (52,90)	64	40	40 (38,44)	22	18,0	10,4	6,3	20	3	0,4	1
13063 RS	●	63 (65,90)	77	50	40 (38,44)	22	18,0	10,4	6,3	20	4	0,5	1
13080 RS	●	80 (82,90)	94	60	50 (48,44)	27	20,0	12,4	7,0	25	4	1,2	1
DGC 13100 RS	●	100 (102,90)	114	70	50 (48,44)	32	46,0	14,4	8,5	32	5	1,6	2
13125 RS	●	125 (127,90)	139	80	63 (61,44)	40	52,0	16,4	9,5	29	6	2,8	1
13160 RS	❍	160 (162,90)	174	130	63 (61,44)	40	88,0	16,4	9,5	29	7	4,5	3
DGC 13200 RS	❍	200 (202,90)	214	150	63 (61,44)	60	130,0	25,7	14,0	35	8	7,1	4
13250 RS	❍	250 (252,90)	264	190	63 (61,44)	60	160,0	25,7	14,0	35	10	11,2	4

● Type: DGCM, Medium Pitch

Cat. No.	Stock	Dimension (mm)									No. of Teeth	Weight (kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	D1	KWW	KDP	CBDP			
DGCM 13050 RS	●	50 (52,90)	64	40	40 (38,44)	22	18	10,4	6,3	20	4	0,3	1
13063 RS	●	63 (65,90)	77	50	40 (38,44)	22	18	10,4	6,3	20	5	0,5	1
13080 RS	●	80 (82,90)	94	60	50 (48,44)	27	20	12,4	7,0	25	6	1,1	1
DGCM 13100 RS	●	100 (102,90)	114	70	50 (48,44)	32	46	14,4	8,5	32	7	1,5	2
13125 RS	●	125 (127,90)	139	80	63 (61,44)	40	52	16,4	9,5	29	8	2,8	1
13160 RS	●	160 (162,90)	174	130	63 (61,44)	40	88	16,4	9,5	29	10	4,6	3
DGCM 13200 RS	❍	200 (202,90)	214	150	63 (61,44)	60	130	25,7	14,0	35	12	7,0	4
13250 RS	❍	250 (252,90)	264	190	63 (61,44)	60	160	25,7	14,0	35	14	11,1	4

● Type: DGCF, Fine Pitch

Cat. No.	Stock	Dimension (mm)									No. of Teeth	Weight (kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	D1	KWW	KDP	CBDP			
DGCF 13050 RS	●	50 (52,90)	64	40	40 (38,44)	22	18	10,4	6,3	20	5	0,3	1
13063 RS	●	63 (65,90)	77	50	40 (38,44)	22	18	10,4	6,3	20	6	0,5	1
13080 RS	●	80 (82,90)	94	60	50 (48,44)	27	20	12,4	7,0	25	8	1,1	1
DGCF 13100 RS	●	100 (102,90)	114	70	50 (48,44)	32	46	14,4	8,5	32	10	1,4	2
13125 RS	●	125 (127,90)	139	80	63 (61,44)	40	52	16,4	9,5	29	12	2,7	1
13160 RS	●	160 (162,90)	174	130	63 (61,44)	40	88	16,4	9,5	29	14	4,4	3
DGCF 13200 RS	❍	200 (202,90)	214	150	63 (61,44)	60	130	25,7	14,0	35	16	6,9	4
13250 RS	❍	250 (252,90)	264	190	63 (61,44)	60	160	25,7	14,0	35	18	11,0	4

( ) Figures in brackets indicate values for ONMU inserts.
Inserts are not included.

■ Identification Details

DGC	M	13	050	R	S
Cutter Series	M: Medium F: Fine	Insert Size	Cutter Diameter	Direction	Metric

● = Euro stock
❍ = Japan stock

Recommended Tightening Torque (N·m)

Inserts

Dimensions (mm)

Application	Coated Carbide										Cermet	
High Speed/Light cut	K P M	P K M	P			K	K		M S		P M	
General Purpose	K P M	P K M		P M	M	K	K		M S		P	
Roughing	K P M			P M	P M			K		M S		
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	T4500A	Fig.
SNMU 13T6ANER L	●	❍	●	●	●	❍	●	●				1
13T6ANER G	●	❍	●	●	●	❍	●	●				1
13T6ANER H	●	❍	●	●	●	❍	●	●				1
13T6ANER FL	●		●	●	●		●	●				2
13T6ANER FG	●	❍	●	●	●	❍	●	●				2
SNEU 13T6ANER L									●	●		1
13T6ANER G									●	●		1
13T6ANER FL									❍	❍		2
13T6ANER FG									●	●		2
XNEU 13T6ANEN W	●	❍		●		❍		●			●	3
ONMU 05T6ANER L	●		●	●	●		●	●				4
05T6ANER G	●	❍	●	●	●	❍	●	●				4
ONEU 05T6ANER L									●	●		4
05T6ANER G									●	●		4

Fig. 1

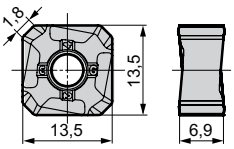


Fig. 2

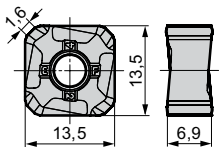


Fig. 3

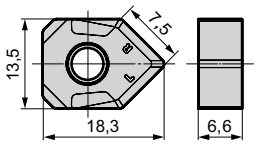
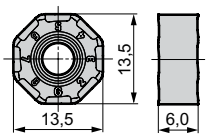
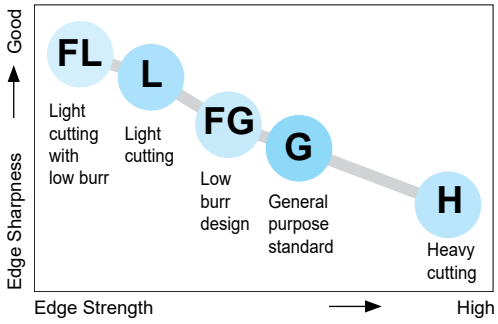


Fig. 4

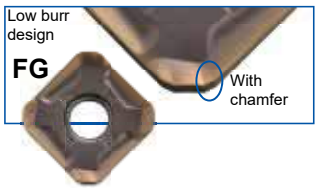


Chipbreaker

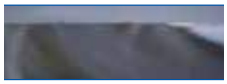


Improved Milling Quality

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



FG



No burrs

Competitor

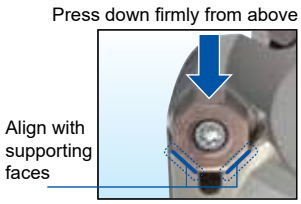
Burrs

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

Attaching Inserts

Octagonal Inserts

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



Spare Parts

Shim	Shim Screw	L Seat Wrench	Insert Srew	Insert Wrench
			3,0 Nm	
DGCS13R	BW0609F	LH040	BFTX0412IP	TRDR15IP

Optional

Insert Srew (*)
BFTX0418IP

*Corners can be changed simply by loosening the screw. (Only suitable for DGC/DGCM types with body size ≥ Ø 80 mm).

Recommended Cutting Conditions (SN_U)

ISO	Work Material	Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_z (min/t)	Depth of Cut (mm)	Grade
P	General Steel	180–280	150–**200**–250	0,10–**0,25**–0,40	<4	ACU2500 ACP200 ACP300 XCU2500
	Alloyed Steel	≤180	180–**250**–350	0,10–**0,30**–0,45	<4	
	Die Steel	200–220	100–**150**–200	0,15–**0,25**–0,35	<4	
M	Stainless Steel	–	160–**200**–250	0,15–**0,23**–0,30	<3	ACU2500 ACM300
K	Cast Iron	250	100–**200**–250	0,10–**0,25**–0,40	<5	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Steel	–	30–**50**–80	0,10–**0,20**–0,30	<3	ACU2500 ACM200 ACM300

Min. – **Optimum** – Max.

Recommended Cutting Conditions (ON_U)

ISO	Work Material	Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_z (min/t)	Depth of Cut (mm)	Grade
P	General Steel	180–280	150–**200**–250	0,10–**0,30**–0,50	<2	ACU2500 ACP200 ACP300 XCU2500
	Alloyed Steel	≤180	180–**250**–350	0,10–**0,50**–0,50	<2	
	Die Steel	200–220	100–**150**–200	0,15–**0,25**–0,30	<2	
M	Stainless Steel	–	160–**200**–250	0,15–**0,23**–0,30	<2	ACU2500 ACM300
K	Cast Iron	250	100–**200**–250	0,10–**0,30**–0,50	<2	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Steel	–	30–**50**–80	0,10–**0,20**–0,30	<2	ACU2500 ACM200 ACM300

General Milling of Steel and Cast Iron

Rake Angle	Radial	20°–24°
	Axial	20°–22°

6 mm 45°

■ Body – Shell type

Fig. 1

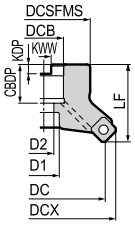


Fig. 2

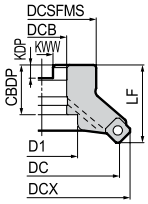


Fig. 3

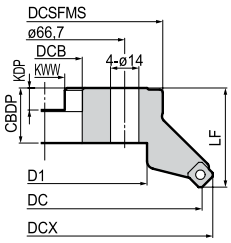
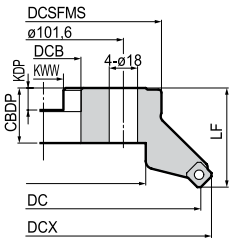


Fig. 4



Cutter body DC ≥ 160 mm: no inner coolant

■ Body

Inner coolant available for DC ≤ Ø 125mm

● Type: WGX, Standard Pitch

Cat. No.	Stock	Dimension (mm)										No. of Teeth	Weight (kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	D1	D2	KWW	KDP	CBDP			
WGX 13040 RS	●	40	52	32	40	16	14,0	9,0	8,4	5,6	18	3	0,3	1
13050 RS	●	50	62	40	40	22	18,0	11,0	10,4	6,3	20	3	0,4	1
13063 RS	●	63	76	50	40	22	18,0	11,0	10,4	6,3	20	4	0,6	1
13080 RS	●	80	93	55	50	27	20,0	13,5	12,4	7,0	25	4	1,2	1
WGX 13100 RS	●	100	113	70	50	32	46,0	-	14,4	8,5	32	5	1,6	2
13125 RS	●	125	138	80	63	40	52,0	29,0	16,4	9,5	29	6	2,8	1
13160 RS	●	160	173	130	63	40	88,0	-	16,4	9,5	29	7	4,5	3
WGX 13200 RS	●	200	213	150	63	60	130,0	-	25,7	14,0	35	8	7,1	4
13250 RS	❍	250	263	190	63	60	160,0	-	25,7	14,0	35	10	11,2	4

● Type: WGXM, Medium Pitch

Cat. No.	Stock	Dimension (mm)										No. of Teeth	Weight (kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	D1	D2	KWW	KDP	CBDP			
WGXM 13050 RS	●	50	62	40	40	22	18,0	11,0	10,4	6,3	20	4	0,4	1
13063 RS	●	63	77	50	40	22	18,0	11,0	10,4	6,3	20	5	0,6	1
13080 RS	●	80	94	55	50	27	20,0	13,5	12,4	7,0	25	6	1,1	1
WGXM 13100 RS	●	100	114	70	50	32	46,0	-	14,4	8,5	32	7	1,6	2
13125 RS	●	125	139	80	63	40	52,0	29,0	16,4	9,5	29	8	2,8	1
13160 RS	●	160	174	130	63	40	88,0	-	16,4	9,5	29	10	4,5	3
WGXM 13200 RS	●	200	214	150	63	60	130,0	-	25,7	14,0	35	12	7,0	4
13250 RS	❍	250	264	190	63	60	160,0	-	25,7	14,0	35	14	11,1	4

● Type: WGXF, Fine Pitch

Cat. No.	Stock	Dimension (mm)										No. of Teeth	Weight (kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	D1	D2	KWW	KDP	CBDP			
WGXF 13050 RS	●	50	62	40	40	22	18,0	11,0	10,4	6,3	20	5	0,4	1
13063 RS	●	63	77	50	40	22	18,0	11,0	10,4	6,3	20	6	0,6	1
13080 RS	●	80	94	55	50	27	20,0	13,5	12,4	7,0	25	8	1,1	1
WGXF 13100 RS	●	100	114	70	50	32	46,0	-	14,4	8,5	32	10	1,5	2
13125 RS	●	125	139	80	63	40	52,0	29,0	16,4	9,5	29	12	2,7	1
13160 RS	●	160	174	130	63	40	88,0	-	16,4	9,5	29	16	4,5	3
WGXF 13200 RS	●	200	214	150	63	60	130,0	-	25,7	14,0	35	20	6,9	4
13250 RS	❍	250	264	190	63	60	160,0	-	25,7	14,0	35	24	11,0	4

( ) Figures in brackets indicate values for ONMU inserts.
Inserts are not included.

■ Identification Details

WGX	M	13	050	R	S
Cutter Series	M: Medium F: Fine	Insert Size	Cutter Diameter	Direction	Metric

● = Euro stock
❍ = Japan stock

Recommended Tightening Torque (N·m)

"Wave Face Mill"
WGX (M/F) Type

General Features

The Wavemill WGX Type employs unique chipbreaker design to provide lower cutting resistance and higher quality surface finishes than conventional tools.

Series

Type	Cat. No.	Cutter	No. of Teeth
Standard Pitch	WGX 13000RS	Ø 40 – Ø 250	3–10
Medium Pitch	WGXM 13000RS	Ø 50 – Ø 250	4–14
Fine Pitch	WGXF 13000RS	Ø 50 – Ø 250	5–24
Endmill Type	WGX 13000EW	Ø 32 – Ø 63	3–5

Inner coolant available for DC ≤ Ø 125 mm

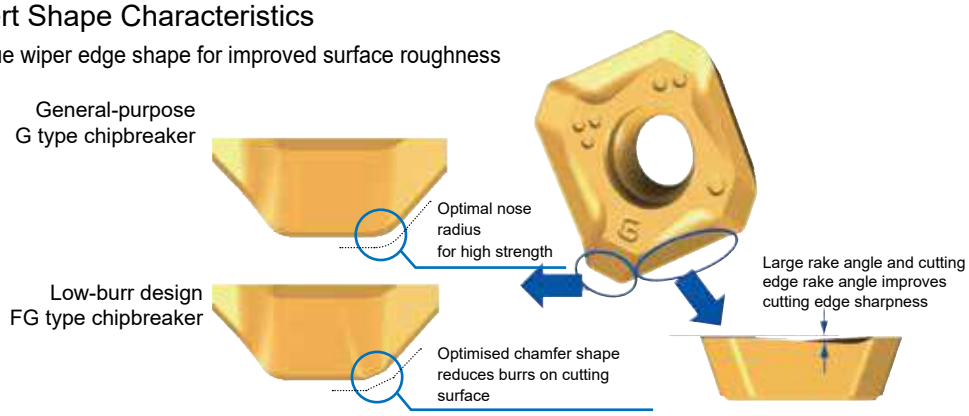
→ H7

Characteristics

- Stable Cutting
  Special chipbreaker designed for WGX enables lower cutting forces.
- High Quality
  Improved run-out precision and unique wiper edge shape ensure excellent surface finish quality.
  Optimised chamfer edge reduces burr and edge chipping.
- Long Tool Life
  Features high precision technology that reduces insert run-out variation and a new coating to provide stable and long tool life.

Insert Shape Characteristics

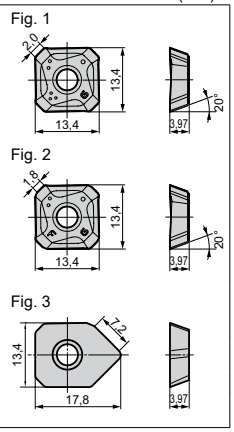
Unique wiper edge shape for improved surface roughness

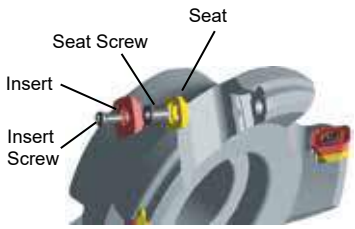


Inserts

Application	Coated Carbide										Carb.	DLC	Cermet	
High Speed/Light Cut			P			K	K		M S		K N	N		
General Purpose				P M	M	K	K		M S	M S		N	P M	
Roughing				P M	P M			K		M S			P	
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Fig.
SEET 13T3AGFR-L											❍	❍		1
SEET 13T3AGSR-L	●	❍	●	●	●	❍	●	●	●	●			●	1
13T3AGSR-G	●	❍	●	●	●	❍	●	●	●	●			●	1
SEMT 13T3AGSR-L	●	❍	●	●	●	❍	●	●	●	●				1
13T3AGSR-G	●	❍	●	●	●	❍	●	●	●	●				1
13T3AGSR-H	●	❍	●	●	●	❍	●	●	●	●				1
SEMT 13T3AGSR-FG	●	❍	●	●	●	❍	●	●	●	●				2
XEEW 13T3AGER-WR	●	❍		❍		❍		❍					❍	3

Dimensions (mm)





Spare Parts

Applicable Cutters	Shim	Shim Screw	Insert Screw	Insert Wrench	Seat Wrench
			3,0 N·m		
WGX (-M/F)	WGCS 13 R	BW 0507 F	BFTX 03512 IP	TRDR 15 IP	LH 035

Recommended Cutting Conditions

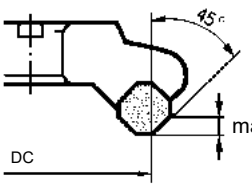
ISO	Work Material	Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/tooth)	Grade
P	General Steel	180–280	150–**200**–250	0,15–**0,20**–0,25	ACU2500 ACP200 XCU2500
	Soft Steel	≤180	180–**265**–350	0,10–**0,25**–0,40	
	Die Steel	200–220	100–**150**–200	0,15–**0,20**–0,25	
M	Stainless Steel	-	160–**205**–250	0,15–**0,23**–0,30	ACU2500 ACM300
K	Cast Iron	250	100–**175** –250	0,15–**0,23**–0,30	ACU2500 ACK200 XCK2000
N	Non Ferrous Alloy	-	500–**750**–1000	0,15–**0,23**–0,30	DL1000
S	Exotic Alloy	-	30 – **50**– 80	0,10–**0,20**–0,30	ACU2500 ACM300

Minimum-**Optimum**-Maximum

UFO / UFOF Type

General Milling for Steel, Cast Iron & Exotic Material

■ Specifications



Approach angle: 45°
Axial rake angle: + 27°
Radial rake angle: - 7°
(-10° for ø 50 and ø 63)

max depth of cut: 5,0 mm (UFO 4000 type)
7,0 mm (UFO 5000 type)

■ Body

Cat. No.	Stock R	Stock L	DC	DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP	No. of Teeth	Max. Depth of Cut	Weight (Kg)	Fig.
UFO 4050 R/L-S	●		50	74	45	50	22	10,4	6,3	20	4	5,0	1,3	1
4063 R/L-S	●		63	86	50	50	22	10,4	6,3	20	5		1,6	1
4080 R/L-S	●		80	103	60	50	27	12,4	7,0	25	5		2,1	1
UFO 4100 R/L-S	●	●	100	122	75	50	32	14,4	8,5	29	6		2,9	2
4125 R/L-S	●		125	146	75	63	40	16,4	9,5	29	7		4,2	2
4160 R/L-S	●		160	180	100	63	40	16,4	9,5	29	9		6,6	3
UFO 4200 R/L-S	●		200	220	130	63	60	25,7	14,0	32	11		9,5	4
4250 R/L-S	❑		250	270	300	63	60	25,7	14,0	40	13		14,8	4
UFO 4315 R/L-S	❑		315	335	240	80	60	25,7	14,0	40	15		26,6	5
UFO 5080 R/L-S	❑		80	102	60	50	27	12,4	7,0	25	5	7,0	2,1	1
UFO 5100 R/L-S	●		100	119	75	50	32	14,4	8,5	29	6		2,9	2
5125 R/L-S	●		125	143	75	63	40	16,4	9,5	29	7		4,2	2
5160 R/L-S	●		160	177	100	63	40	16,4	9,5	29	9		6,6	3
UFO 5200 R/L-S	●		200	217	130	63	60	25,7	14,0	32	11		9,5	4
5250 R/L-S	❑		250	267	200	63	60	25,7	14,0	40	13		14,8	4
UFO 5315 R/L-S	❑		315	332	240	80	60	25,7	14,0	40	15		26,6	5

Fig. 1

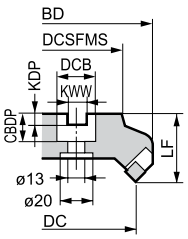


Fig. 2

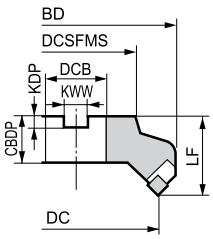


Fig. 3

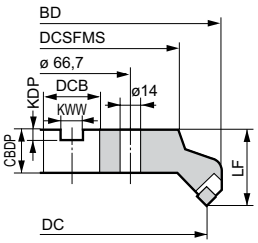


Fig. 4

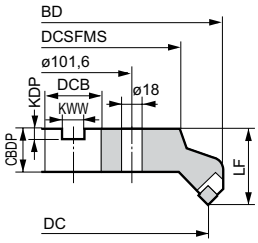
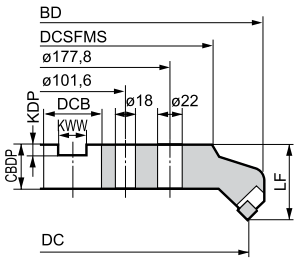
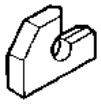


Fig. 5

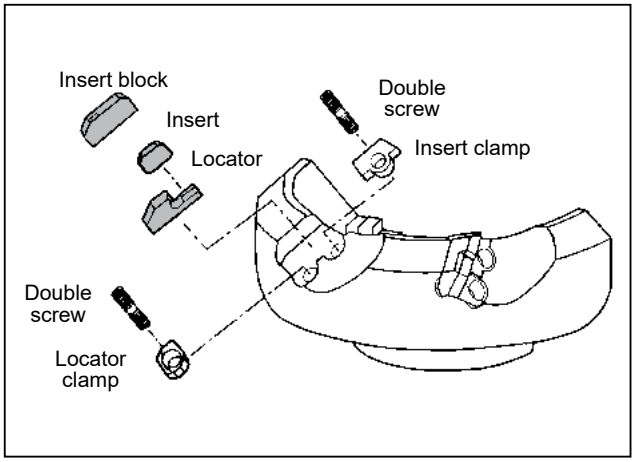


■ Spare Parts

Cutter	Locator	Insert block	Insert clamp
			
4050–4063	UF 4 K R/L	S-UF 4 S R/L	UFTW R/L
4080–4315	UF 4 K R/L	UF 4 S R/L	
5080–5315	UF 5 K R/L	UF 5 S R/L	

Cutter	Locator clamp	Double screw	Wrench
4050–4063	UFKW R/L	WB 7-15 T	TT 25
4080–4315			
5080–5315			

■ Structure



● = Euro stock
○ = Japan stock

❑ = Delivery on request

Features

- 45° approach face mills
- 27° super high rake multi purpose cutter for outstanding productivity milling steels, irons and alloys
- Substantially improves metal removal rates on low powered machines
- Differential pitched inserts guarantee smooth cutting action
- Rigid body incorporates carbide locators and HSS shims resulting in extremely low run out

Body (Fine Pitch Type)

Cat. No.	Stock R	Stock L	DC	DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP	No. of Teeth	Max. Depth of Cut	Weight (Kg)	Fig.
UFOF 4080 R/L-S	●		80	103	60	50	27	12,4	7,0	25	6	5,0	2,1	1
UFOF 4100 R/L-S	●		100	122	75	50	32	14,4	8,5	29	8		2,9	2
4160 R/L-S	●		160	180	100	63	40	16,4	9,5	29	12		6,6	3
UFOF 4200 R/L-S	❑		200	220	130	63	60	25,7	14,0	32	16		9,5	4
4250 R/L-S	❑		250	270	300	63	60	25,7	14,0	40	20		14,8	4
UFOF 4315 R/L-S	❑		315	335	240	80	60	25,7	14,0	40	24		26,6	5

Insert

Dimensions (mm)

Grade	Coated Carbide					Cermet	Uncoated Carbide			
High Speed/Light Cut	P			K						K/N
General Purpose		P/M	P/M	K		P	P	K	K	
Roughing		P/M	P/M		K					

	Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	T250A	A30N	G10E	H1	H10E	Fig.
UFO(F) 4000	SFKN 12T3 AZFN				●	●			●	●		1(2)
	12T3 AZTN	●	●	●			❍	❍	●			1(2)
	SFKR 12T3 AZTN		❑									3
	UW 12500 R										❍	4
UFO 5000	SFKN 1504 AZFN					❍						5(6)
	1504 AZTN	●	●	●								5(6)

Fig. 1 (Grades: ACP_, ACK_)

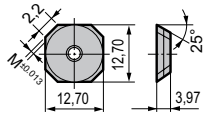


Fig. 2

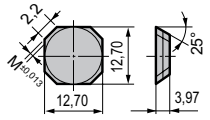


Fig. 3

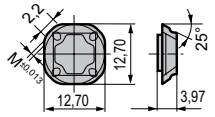


Fig. 4

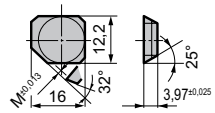


Fig. 5 (Grades: ACP_, ACK_)

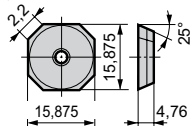
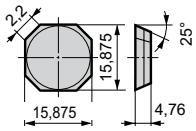


Fig. 6



Recommended Cutting Conditions

(v_c =m/min, f_z =mm/tooth) (min.– **optimum** – max.)

Grade		ACP100			ACP200			ACP300		ACK200		ACK300	
Work Material / Insert Type		Low carbon steel	Alloy steel	Die steel	Low carbon steel	Alloy steel	Die steel	Stainless steel austenitic	Stainless steel martensitic	Cast iron	Ductile cast iron	Cast iron	Ductile cast iron
UFO (-F) 4000	v_c	100–**250**–400	80–**220**–280	80–**150**–250	80–**200**–370	70–**150**–250	60–**130**–220	120–**180**–240	100–**140**–200	220–**270**–450	150–**180**–250	180–**220**–270	130–**160**–220
	f_z	0,1–**0,25**–0,4	0,1–**0,25**–0,4	0,1–**0,2**–0,3	0,1–**0,25**–0,4	0,1–**0,25**–0,4	0,1–**0,2**–0,3	0,1–**0,2**–0,3	0,1–**0,2**–0,3	0,1–**0,25**–0,4	0,1–**0,25**–0,4	0,1–**0,25**–0,4	0,1–**0,25**–0,4
	a_p	1,0–**3,0**–5,0			1,0–**3,0**–5,0			1,0–**2,0**–3,0		1,0–**3,0**–5,0		1,0–**3,0**–5,0	
UFO (-F) 5000	v_c	100–**250**–400	80–**220**–280	80–**150**–250	80–**200**–370	70–**150**–250	60–**130**–220	120–**180**–240	100–**140**–200	220–**270**–450	150–**180**–250	180–**220**–270	130–**160**–220
	f_z	0,1–**0,25**–0,4	0,1–**0,25**–0,4	0,1–**0,2**–0,3	0,1–**0,25**–0,4	0,1–**0,25**–0,4	0,1–**0,2**–0,3	0,1–**0,2**–0,3	0,1–**0,2**–0,3	0,1–**0,25**–0,4	0,1–**0,25**–0,4	0,1–**0,25**–0,4	0,1–**0,25**–0,4
	a_p	1,0–**4,0**–7,0			1,0–**4,0**–7,0			1,0–**2,0**–5,0		1,0–**4,0**–7,0		1,0–**4,0**–7,0	

DNX / DNXF Type

General Milling for Cast Iron and Steel

Approach angle	:	65°
Axial rake angle	:	+ 5°
Radial rake angle	:	- 6°

8 mm / 65°

Fig. 1

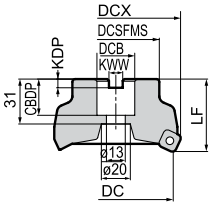


Fig. 2

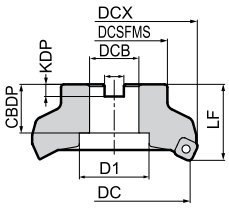


Fig. 3

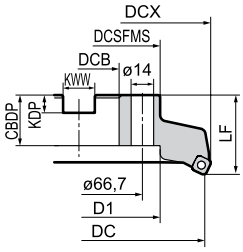
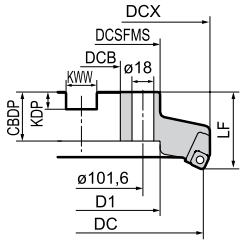


Fig. 4



■ Body

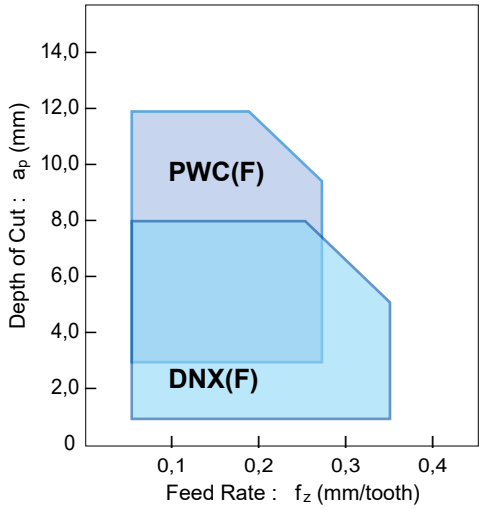
● Standard DNX - Type

Cat. No.	Stock	Dimensions (mm)									No of Teeth	Max. Depth of Cut	Weight (Kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	D1	KWW	KDP	CBDP				
DNX 12080 RS	●	80	88	60	50	27	-	12,4	7,0	25	6	8,0	1,2	1
DNX 12100 RS	●	100	108	80	50	32	46	14,4	8,5	29	7		1,6	2
12125 RS	●	125	133	80	63	40	56	16,4	9,5	29	8		2,8	2
12160 RS	●	160	168	100	63	40	88	16,4	9,5	29	10		4,4	3
DNX 12200 RS	❑	200	210	150	63	60	130	25,7	14,0	35	16		8,0	4
12250 RS	❑	250	260	180	63	60	160	25,7	14,0	25	20		12,2	4

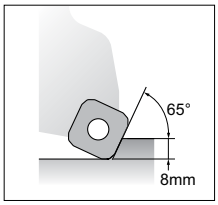
● Fine Pitch DNXF - Type

Cat. No.	Stock	Dimensions (mm)									No of Teeth	Max. Depth of Cut	Weight (Kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	D1	KWW	KDP	CBDP				
DNXF 12080 RS	●	80	88	60	50	27	-	12,4	7,0	25	8	8,0	1,2	1
DNXF 12100 RS	●	100	108	80	50	32	46	14,4	8,5	29	10		1,6	2
12125 RS	●	125	133	80	63	40	56	16,4	9,5	29	11		2,7	2
12160 RS	●	160	168	100	63	40	88	16,4	9,5	29	12		4,4	3

■ First Recommendation: DNX



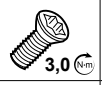
DNX / DNXF



Wiper width = 1,2 mm

Max. depth of cut : 8 mm, Approach angle : 65°		
Cutter Type	Diameter Range	Characteristics
DNX 12000 RS	Ø 80–Ø 250 mm	- General purpose - Medium pitch type
DNXF 12000 RS	Ø 80–Ø 160 mm	- General purpose - Fine pitch type

■ Spare Parts

Cutter	Insert Screw	Insert Wrench	Locator	Clamp Screw	Wrench
	 3,0 N·m				
Ø 80 – Ø 160	BFTX0412 IP	TRDR15 IP	–	–	–
Ø 200, Ø 250			DNXK 12 R	BX 0515	LH 040

■ Identification Details

DNX F 12 080 R S

DNX	F	12	080	R	S
Cutter type	Fine pitch	Insert size	Diam.	Cutting direction	Shell type

● = Euro stock
○ = Japan stock

❑ = Delivery on request

N·m Recommended Tightening Torque (N·m)

DNX / DNXF Type

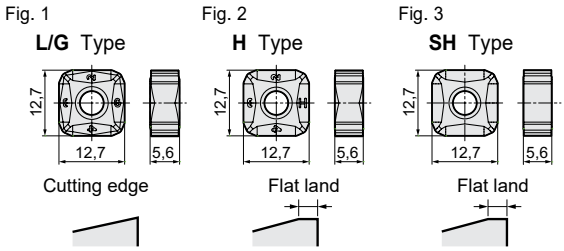
Features

- Small inserts with 8 cutting edges
- Economic by double-side usage
- Excellent grade for cast iron machining
- Optimised geometry for best results in cast iron
- Special inserts for steel machining

Insert

Dimensions (mm)

Application	Coated Carbide					
High Speed/Light cut			K	K		
General Purpose	P M	P M	K	K		
Roughing	P M	P M			K	
Cat. No.	ACP200	ACP300	ACK100	ACK200	ACK300	Fig.
SNMT 1205 ZNEN-L	❍					1
1205 ZNEN-G	●		●	●	●	1
1205 ZNEN-H	●		●	●	●	2
1205 ZNEN-SH	●	❍	●	●	●	3

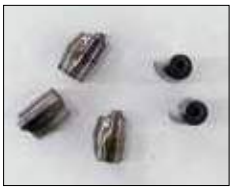


L Type : For light machining
G Type : For general purpose
H Type : For heavy machining
SH Type : For steel machining

- Negative inserts
- Inserts with 8 cutting edges
- Applicable for steel machining

Advantage of SH-Type when Steel machining

G Type



Chip packing causes higher cutting forces !

SH Type

Smooth chip evacuation reduces cutting forces !

Recommended Cutting Conditions

(v_c = m/min, f_z = mm/tooth) (min.– **optimum** – max.)

ISO	Work Material	Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_t (mm/tooth)	Insert Grade
P	Carbon steel	180–280	150–**175**–200	0,10–**0,15**–0,20	ACP200
	Alloy steel	180–280	150–**175**–200	0,10–**0,15**–0,20	ACP200
K	Grey cast iron (GG)	250	150–**225**–300	0,10–**0,20**–0,30	ACK200/ACK300
	Ductile cast iron (GGG)	250	150–**225**–250	0,10–**0,18**–0,25	ACK200/ACK300

"Wave Radius Mill"
WRCX Type

■ Features

The "Wave Mill" WRCX type is a new multi purpose milling cutter for face milling, slotting, helical boring, plunging and profiling. Its unique design features 16 corner polygon inserts and a durable cutter body manufactured from high tensile alloyed steel protected by a hard surface treatment. Insert rigidity is maximised via close tolerance seat pockets and centre clamped using a torxscrew . Choose from a variety of insert grades such as our award winning Diamond like Carbon DL 1000 capable of high feed machining aluminium, our uncoated H1 grade suitable for non-ferrous metals or our new ACP/ACK grades for steels and irons.

■ Advantages

- ● Durable cutter body – Special alloyed steel with hard surface.
- ● High feed cutting – Optimised pitch and high number of cutting edges
- ● Excellent chip removal – Wide pocket and integral coolant hole
- ● Maximum rigidity – Rigid clamping of inserts with TORXPLUS screw
- ● Wide application range – Carbon steels, alloy steels, stainless steels, high temperature alloys, diemould steels, aluminiums, non-ferrous metals etc

■ Insert

Application	Coated Carbide					Uncoated Carbide	Diamond Coated					
High Speed / Light cut	P			K		K/N	N					
General Purpose		P/M	P/M	K			N					
Roughing		P/M	P/M		K							
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Dimensions (mm) IC	RE	S	Fig.	Applicable Endmill
QPMT 120440 PPEN	●	●	●	●	●			12	4,0	4,76	1	WRCX/-F 12000 RS
120440 PPEN-H	●	●	●	●	●							
QPET 120460 PPFR-S						●	●		6,0		2	WRCX/-F/-X 16000 RS
QPMT 160660 PPEN	●	●	●	●	●			16	6,0	6,5	1	
160660 PPEN-H	●	●	●	●	●							
QPET 160680 PPFR-S						●	●		8,0		2	WRCXF 20000 RS
QPMT 200670 PPEN		●	●	●	●			20	7,0	6,5	1	
200670 PPEN-H		●	●	●	●							

Fig. 1

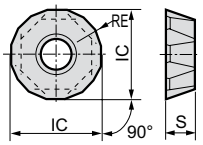
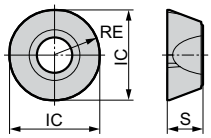


Fig. 2



QPMT... : Standard 16 cornered polygon type
QPMT...-H: Stronger cutting edge type

QPET...-S: Polished round insert for non-ferrous material

● Anti-Vibration Type (Paired Sets for Vibration Free Machining)

Application	Coated Carbide					Uncoated Carbide	Diamond Coated					
High Speed / Light cut	P			K		K/N	N					
General Purpose		P/M	P/M	K			N					
Roughing		P/M	P/M		K							
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Dimensions (mm) IC	RE	S	Fig.	Applicable Endmill
QPMT 160608 PPEN	●	●	●	●	●			16	0,8	6,5	1	WRCX/-F/-X 16000 RS
160608 PPEN-CP		●	●	●	●						3	
QPMT 200608 PPEN	●	●	●		●			20	0,8	6,5	1	WRCXF 20000 RS
200608 PPEN-CP		●	●		●						3	

Fig. 1
08

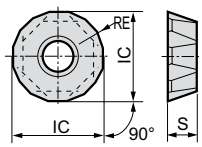
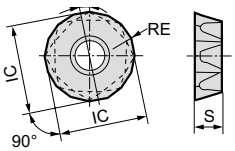
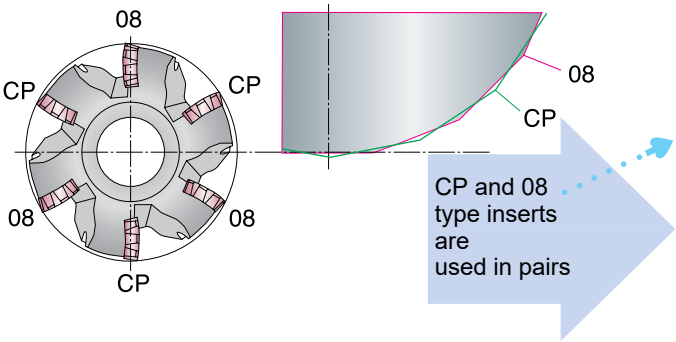


Fig.3
CP



The combination of different inserts in a staggered formation varies the cut depth and eliminates vibration when feed rate is

$f_z < 0{,}15$ (IC = 16 mm)
or
$f_z < 0{,}2$ (IC = 20 mm).



● Chip Formation

Anti-vibration Type	Standard Type

Work Material: 50C
Cutting Data: f_z = 0,1mm/tooth, a_p = 7 mm
Insert Size: IC = 20 mm

● = Euro stock
○ = Japan stock

❑ = Delivery on request

Recommended Tightening Torque (N·m)

Fig. 1

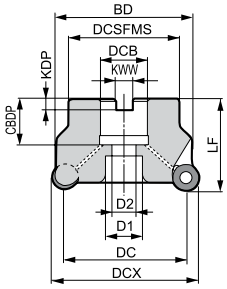


Fig. 2

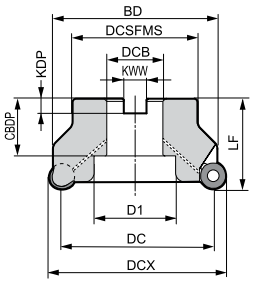
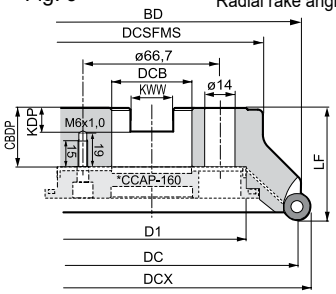


Fig. 3

Axial rake angle: - 3°
Radial rake angle: 0°



■ Body

* Note Fig.3 for DCX=160 : Coolant cap (CCAP-160) with 4 screws (BX0620) and wrench (TH050) is available seperately.

● Standard WRCX Type

Cat. No.	Stock	Dimensions (mm) DCX*	DC	BD	DCSFMS	LF*	KWW	KDP	DCB	D2	D1	CBDP	No. of Teeth	Helical Boring øB Standard	Ramping αmax.	Weight (Kg)	Fig.
WRCX 12040 RS	●	40	28	36	36	40	8,4	5,6	16	9	14	18	4	68 ± 11	10°	0,2	1
12050 RS	●	50	38	46	40	40	10,4	6,3	22	11	18	20	4	88 ± 11	7°	0,3	1
12052 RS	●	52	40	48	40	40	10,4	6,3	22	11	18	20	5	92 ± 11	6°30'	0,3	1
12063 RS	●	63	51	59	40	40	10,4	6,3	22	11	18	20	5	114 ± 11	5°	0,4	1
12080 RS	●	80	68	76	55	50	12,4	7,0	27	13,5	20	25	6	148 ± 11	3°30'	0,9	1
WRCX 16063 RS	●	63	47	50	50	40	10,4	6,3	22	11	18	20	3	110 ± 15	8°	0,4	1
16080 RS	●	80	64	70	55	50	12,4	7,0	27	13,5	20	25	4	144 ± 15	5°30'	0,8	1
WRCX 16100 RS	●	100	84	90	70	50	14,4	8,5	32	-	46	32	5	184 ± 15	4°	1,3	2
16125 RS	❑	125	109	115	80	63	16,4	9,5	40	-	52	38	5	234 ± 15	3°	2,4	2

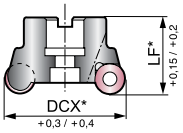
● Fine Pitch WRCXF Type

Cat. No.	Stock	Dimensions (mm) DCX*	DC	BD	DCSFMS	LF*	KWW	KDP	DCB	D2	D1	CBDP	No. of Teeth	Helical Boring øB Standard	Ramping αmax.	Weight (Kg)	Fig.
WRCXF 12050 RS	❍	50	38	46	40	40	10,4	6,3	22	11	18	20	5	88 ± 11	7°	0,3	1
12063 RS	❍	63	51	59	40	40	10,4	6,3	22	11	18	20	6	114 ± 11	5°	0,4	1
WRCXF 16052 RS	●	52	36	45	45	40	10,4	6,3	22	11	17,7	20	4	88 ± 15	10°	0,3	1
16063 RS	●	63	47	50	50	40	10,4	6,3	22	11	18	20	4	110 ± 15	8°	0,4	1
16080 RS	●	80	64	70	55	50	12,4	7,0	27	13,5	20	25	5	144 ± 15	5°30'	0,8	1
WRCXF 16100 RS	●	100	84	90	70	50	14,4	8,5	32	-	46	32	6	184 ± 15	4°	1,3	2
16125 RS	●	125	109	115	80	63	16,4	9,5	40	29	52	29	6	234 ± 15	3°	2,4	1
16160 RS	●	160	144	150	100	63	16,4	9,5	40	-	93	29	8	304 ± 15	2°	4,0	3*
WRCXF 20080 RS	●	80	60	68	55	50	12,4	7,0	27	13,5	20	25	5	140 ± 18	7°	0,7	1
WRCXF 20100 RS	●	100	80	88	70	50	14,4	8,5	32	-	46	32	6	180 ± 18	5°	1,1	2
20125 RS	●	125	105	113	80	63	16,4	9,5	40	29	52	29	6	230 ± 18	3°30'	2,3	1
20160 RS	●	160	140	148	100	63	16,4	9,5	40	-	93	29	8	300 ± 18	2°30'	3,9	3*

● Extra Fine Pitch WRCXX Type

Cat. No.	Stock	Dimensions (mm) DCX*	DC	BD	DCSFMS	LF*	KWW	KDP	DCB	D2	D1	CBDP	No. of Teeth	Helical Boring øB Standard	Ramping αmax.	Weight (Kg)	Fig.
WRCXX 16080 RS	●	80	64	70	55	50	12,4	7,0	27	13,5	20	25	6	144 ± 15	5°30'	0,8	1
16100 RS	●	100	84	90	70	50	14,4	8,5	32	-	46	32	7	184 ± 15	4°	1,3	2

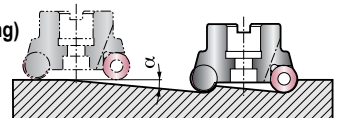
* Note : When using CP type anti-vibration inserts / IC = 16, please change above dimensions: DCX* +0,3 & LF* +0,15 mm
In case of anti-vibration inserts / IC = 20, please change above dimensions: DCX* +0,4 & LF* +0,2 mm



■ Maximum Rotation (min^{-1}) for Non-ferrous cutting when using QPET Insert

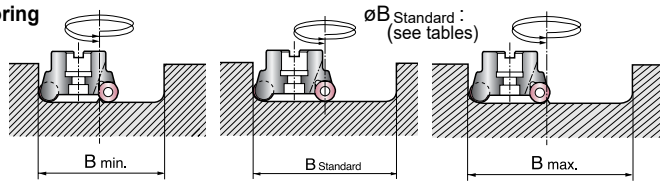
Cutter DC (mm)	Insert Cat. No. QPET10...S	QPET12...S	QPET16...S
25	28.000		
32	25.000		
40		22.000	15.000
50		20.000	14.000
63		18.000	13.000
80		16.000	12.000
100			10.000
125			9.000
160			8.000

Ramping (Slant Milling)



α max : (see tables)

Helical Boring



■ Spare Parts

Cutter		Screw		Screw
			N·m	
WRCX	12○○○	BFTX 0409 IP	3,0	TRDR 15 IP
WRCX/-F/-X	16052–16100	BFTX 0511 IP	5,0	TRDR 20 IP
	16125–16160	BFTX 0513 IP	5,0	
WRCX/-F	20○○○	BFTX 0615 IP	5,0	TRDR 25 IP

■ Recommended Cutting Conditions

DCX (mm) \ Material / Grade		Carbon steel (ex. C40 ~ C50)	Alloy steel (Below HRC40)	Stainless steel (ex. X10CrNiS18-9)	Cast iron (ex. GG20)	Non-ferrous material
		ACP100, ACP200	ACP100, ACP200	ACP200, ACP300	ACK200, ACK300	DL1000, H1
40 ~ 80	v_c	100–**160**–200	100–**140**–180	80–**120**–160	80–**120**–160	200–**500**–1000
	f_z	0,2–**0,4**–0,6	0,2–**0,3**–0,4	0,1–**0,2**–0,3	0,1–**0,2**–0,4	0,1–**0,3**–0,4
100 ~ 160	v_c	150–**200**–250	100–**160**–200	160–**180**–200	100–**150**–200	200–**500**–1000
	f_z	0,3–**0,4**–0,6	0,1–**0,3**–0,5	0,15–**0,2**–0,3	0,1–**0,15**–0,2	0,2–**0,3**–0,6

[v_c = m/min, f_z = mm/tooth] [min.– optimum – max.]

→ H74-75

RSX Series

■ Features

The Wave Radius Mill RSX Series enables stable machining even when using equipment with low clamp rigidity thanks to its body design achieving excellent cutting performance and rigidity.
In addition to the ACM Series for stainless steel and exotic alloys two grades have been added:
ACP200 grade for steel machining and
ACK300 grade for cast iron machining.
Handle an even wider range of milling needs with the RSX(F)08000 and RSX(F)20000 types.

■ Characteristics

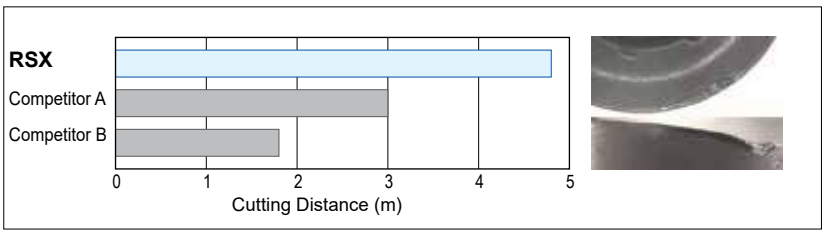
Smooth cutting action and low vibration machining provided based on the high rake angle design and high rigidity body.
High reliability achieved with ACM100/ACM200/ACM300 adopted for exotic alloy machining.
ACP200 for steel and ACK300 for cast iron enable stable machining in a wide range of applications.

■ Series

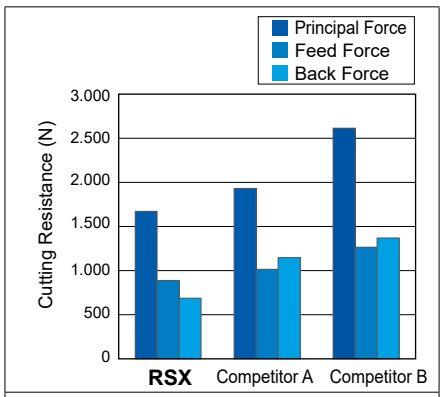
Image	Series	Insert Size	Cat. No.	External Diameter (mm)											
				Ø 20	Ø 25	Ø 32	Ø 40	Ø 50	Ø 52	Ø 63	Ø 66	Ø 80	Ø 100	Ø 125	Ø 160
Shank Type → H76	Standard	08	RSX 08000 ES	●	●										
		10	10000 ES		●	●									
		12	12000 ES			●									
	Fine Pitch	08	RSXF 08000 ES	●	●										
		10	10000 ES		●	●									
		12	12000 ES			●									
Shell Type	Standard	10	RSX 10000 RS				●	●	●						
		12	12000 RS				●	●	●	●	●	●	●		
		16	16000 RS							●		●	●	●	
		20	20000 RS									●	●	●	●
	Fine Pitch	10	RSXF 10000 RS				●	●	●						
		12	12000 RS				●	●	●	●	●	●	●		
		16	16000 RS							●		●	●	●	❑
		20	20000 RS									●	●	●	●
Modular Type → H77	Standard	08	RSX 08000 M	●	●	●									
		10	10000 M		●	●									
		12	12000 M			●	●								
	Fine Pitch	08	RSXF 08000 M	●	●	●									
		10	10000 M		●	●									
		12	12000 M			●	●								

■ Cutting Performance

● Tool Life Comparison (Fracture Resistance)

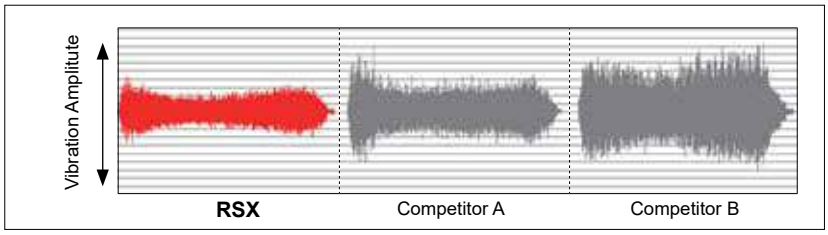


● Cutting Resistance Comparison



Work Material: X5CrNiS1810
Tool: Ø 50
Cutting Data: v_c = 200m/min, f_z = 0,5mm/t, a_p = 2,0mm, a_e= 10,0mm, Wet

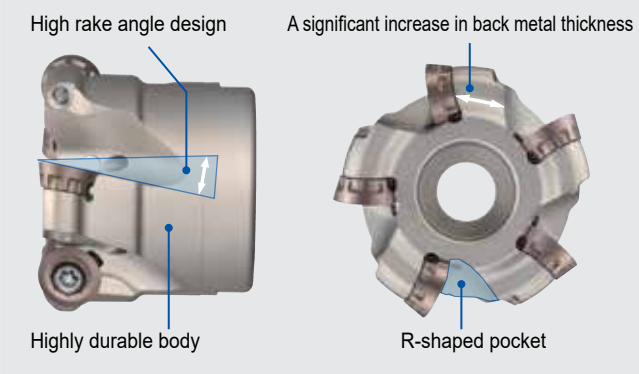
● Cutting Vibration Comparison



● = Euro stock
❑ = Delivery on request

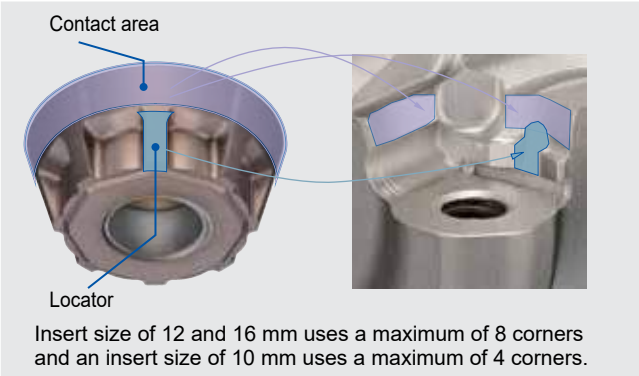
Low Cutting Resistance, Less Vibration

Low cutting resistance and low vibration machining have been achieved with super high rake angle design + high rigidity body.

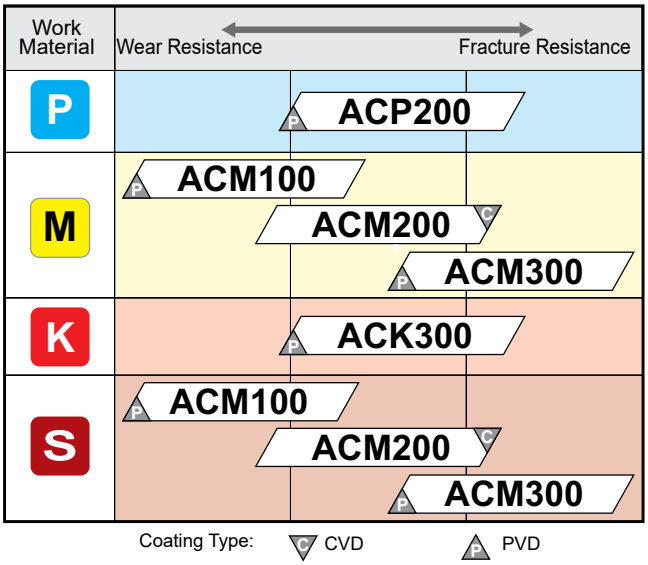


High Operability

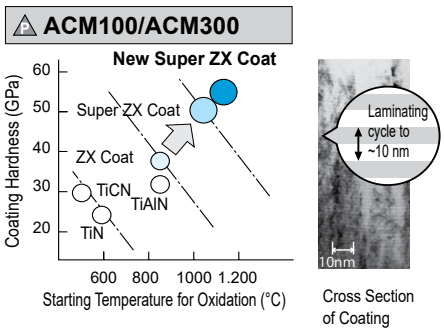
Ease of corner control has been achieved with the adoption of a unique positioning mechanism that is highly precise and highly operable.

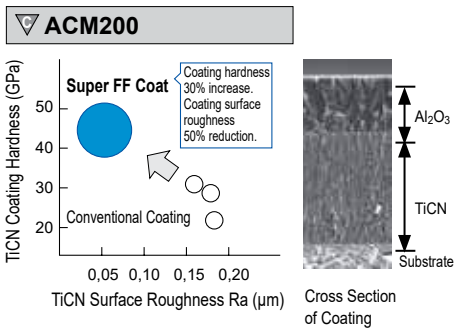


Stable and Long Tool Life



A long life ensured with the adoption of the ACM series and significant improvements have been made in processing exotic alloy and stainless steel machining.





New Super ZX Coat

The product series with a coating film hardness approximately 40 % higher and an oxidation onset temperature 200 °C higher than conventional products.
Enables machining at least 1,5 times faster and more efficiently than conventional products.
A product life at least twice as long as that of conventional products achieved under the same machining conditions.

Super FF Coat

Smooth coating surface provides excellent adhesion and chipping resistance.
Improved coating adhesion strength.
Harder than conventional coatings with hugh improvements in wear resistance.
High speed, high effiency machining of more than 1,5 times than of conventional grades possible.
Achieving more than double the tool life of conventional grades under the same cutting conditions.

RSX(F)10000/12000/16000/20000RS

Milling of steel, stainless steel, cast iron and exotic alloys

Rake Angle		
	Radial	–5°
	Axial	10°

5 mm (10000RS) | 6 mm (12000RS) | 8 mm (16000RS) | 10 mm (20000RS)

Body – Dimensions

Fig. 1

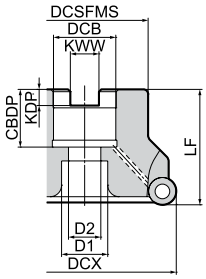


Fig. 2

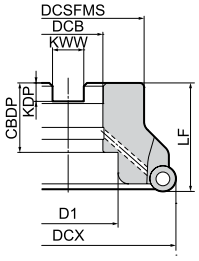
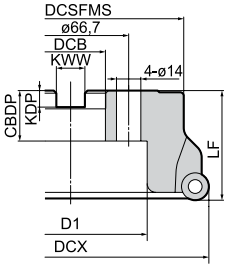


Fig. 3



Body

● RSX...RS, Standard

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
RSX 10040 RS	●	40	34	40	16	8,4	5,6	18	14	9	4	0,2	1
10050 RS	●	50	40	40	22	10,4	6,3	20	18	11	5	0,3	1
10052 RS	●	52	40	40	22	10,4	6,3	20	18	11	5	0,4	1
RSX 12040 RS	●	40	32	40	16	8,4	5,6	18	13,5	9	3	0,2	1
12050 RS	●	50	40	40	22	10,4	6,3	20	18	11	4	0,3	1
12052 RS	❍	52	40	40	22	10,4	6,3	20	18	11	4	0,3	1
12063 RS	●	63	40	40	22	10,4	6,3	20	18	11	5	0,4	1
12066 RS	●	66	55	50	27	12,4	7,0	25	20	14	6	0,7	1
12080 RS	●	80	55	50	27	12,4	7,0	25	20	14	6	1,0	1
RSX 12100 RS	●	100	70	50	32	14,4	8,5	32	46	-	6	1,4	2
RSX 16063 RS	●	63	50	40	22	10,4	6,3	20	18	11	4	0,5	1
16080 RS	●	80	55	50	27	12,4	7,0	25	20	14	5	0,9	1
RSX 16100 RS	●	100	70	50	32	14,4	8,5	32	46	-	6	1,3	2
16125 RS	●	125	80	63	40	16,4	9,5	29	52	29	6	2,6	1
RSX 20080 RS	❍	80	55	50	27	12,4	7,0	22	20	14	4	0,9	1
RSX 20100 RS	●	100	70	63	32	14,4	8,0	32	46	-	5	1,8	2
20125 RS	●	125	80	63	40	16,4	9,0	29	52	29	6	2,6	1
20160 RS	●	160	130	63	40	16,4	9,0	29	90	-	7	4,7	3

● RSXF...RS, Fine Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
RSXF 10040 RS	●	40	34	40	16	8,4	5,6	18	14	9	5	0,2	1
10050 RS	●	50	40	40	22	10,4	6,3	20	18	11	6	0,3	1
10052 RS	●	52	40	40	22	10,4	6,3	20	18	11	6	0,3	1
RSXF 12040 RS	●	40	32	40	16	8,4	5,6	18	13,5	9	4	0,2	1
12050 RS	●	50	40	40	22	10,4	6,3	20	18	11	5	0,3	1
12052 RS	●	52	40	40	22	10,4	6,3	20	18	11	5	0,3	1
12063 RS	●	63	40	40	22	10,4	6,3	20	18	11	6	0,4	1
12066 RS	●	66	55	50	27	12,4	7,0	25	20	14	7	0,7	1
12080 RS	●	80	55	50	27	12,4	7,0	25	20	14	7	0,9	1
RSXF 12100 RS	●	100	70	50	32	14,4	8,5	32	46	-	10	1,3	2
RSXF 16063 RS	●	63	50	40	22	10,4	6,3	20	18	11	5	0,4	1
16080 RS	●	80	55	50	27	12,4	7,0	25	20	14	6	0,8	1
RSXF 16100 RS	●	100	70	50	32	14,4	8,5	32	46	-	7	1,3	2
16125 RS	●	125	80	63	40	16,4	9,5	29	52	29	8	2,5	1
16160 RS	❑	160	130	63	40	16,4	9,5	29	88	-	10	4,8	3
RSXF 20080 RS	●	80	55	50	27	12,4	7,0	22	20	14	5	0,9	1
RSXF 20100 RS	●	100	70	50	32	14,4	8,0	32	46	-	6	1,8	2
20125 RS	❍	125	80	63	40	16,4	9,0	29	52	29	7	2,6	1
20160 RS	❍	160	130	63	40	16,4	9,0	29	90	-	9	4,6	3

Identification Details

RSX	F	12	040	R	S
Cutter Series	Fine Pitch Type	Insert Size	Cutter Diameter	Cutting Direction	Metric

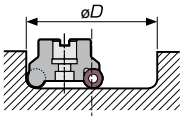
● = Euro stock
❍ = Japan stock
❑ = Delivery on request
Recommended Tightening Torque (N·m)

Various Machining Use

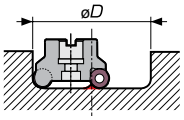
Various types of processing, such as mould engraving, slant milling and helical processing.

Helical Milling

Helical Milling

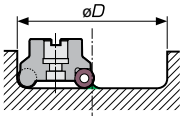


≤ Work Diameter



Center uncut portion cannot be removed by traverse cutting with the same cutter.

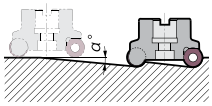
≥ Work Diameter



Center uncut portion can be removed by traverse cutting with the same cutter.

Ramping

Use at α° or lower



Recommended Values for Helical and Ramping

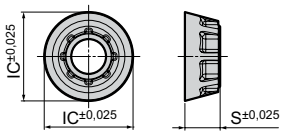
Insert Cat. No.	Helical				Taper
	Cutter ØDC	Work Diameter			Ramping Angle α°(max)
		Min.	Optimal Ø	Max.	
RDET10...	25	33,0	40	49	10°30'
	32	46,0	54	63	6°45'
	40	62,0	70	79	4°30'
	50	82,0	90	99	3°15'
	52	86,0	94	103	3°10'
RDET12...	32	41,5	52	63	12°30'
	40	57,5	68	79	8°00'
	50	77,5	88	99	5°30'
	52	81,5	92	103	5°15'
	63	103,5	114	125	4°00'
	66	109,5	120	131	3°45'
	80	137,5	148	159	2°50'
	100	177,5	188	199	2°10'
RDET16...	63	96,0	110	125	6°00'
	80	130,0	144	159	4°10'
	100	170,0	184	199	3°00'
	125	220,0	234	249	2°20'
RDET20...	80	122,0	140	159	4°15'
	100	162,0	180	199	3°00'
	125	212,0	230	249	2°00'
	160	282,0	300	319	1°15'

Inserts

Dimensions (mm)

Application	Grade				
High Speed/Light Cut			M S	M S	
General Purpose	P M		M S	M S	M S
Roughing	P M	K			M S

Cat. No.	ACP200	ACK300	ACM100	ACM200	ACM300	Dimens. ød (IC)	Dimens. S	Applicable Cutters
RDET 10T3M0EN G	●	●	●	●	●	10	3,97	RSX(F) 10000RS
10T3M0EN H	●	●	●	●	●	10	3,97	
RDET 1204M0EN G	●	●	●	●	●	12	4,76	RSX(F) 12000RS
1204M0EN H	●	●	●	●	●	12	4,76	
RDET 1606M0EN G	●	●	●	●	●	16	6,5	RSX(F) 16000RS
1606M0EN H	●	●	❍	●	●	16	6,5	
RDET 2006M0EN G	●	●	❍	●	●	20	6,5	RSX(F) 20000RS
2006M0EN H	❍	●	❍	❍	●	20	6,5	



Cutting Edge Cross Section

G - Type **H** - Type

M0: IC is metric

Spare Parts

Applicable Cutters	Wrench	Screw	
			N·m
RSX(F) 10000RS	TRDR15IP	BFTX03584IP	**3,0**
RSX(F) 12000RS		BFTX0409IP	**3,0**
RSX(F) 16000RS	TRDR20IP	BFTX0511IP	**5,0**
RSX(F) 20000RS	TRDR25IP	BFTX0615IP	**5,0**

Recommended Cutting Conditions

Min.-**Optimum**-Max.

ISO	Work Material			Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
P	Carbon Steel			180–280	100–**160**–200	0,20–**0,40**–0,60	ACP200
	Alloy Steel			180–280	100–**140**–180	0,20–**0,30**–0,40	ACP200
M	Stain-less Steel	Cr Based	Ferritic	200	150–**180**–200	0,15–**0,25**–0,35	ACM300
			Martensitic	200–330	80–**120**–180	0,15–**0,25**–0,35	ACM300
		Cr-Ni Based	Austenitic	200	150–**180**–200	0,15–**0,25**–0,35	ACM300
			Austenitic, ferritic	230–270	80–**120**–180	0,15–**0,25**–0,35	ACM200
			Precipitation hardening	330	60–**100**–160	0,15–**0,25**–0,35	ACM200
K	Cast Iron			250	80–**120**–160	0,10–**0,30**–0,40	ACK300
S	Heat resistant alloy		Ni based material	250–350	20–**30**–40	0,10–**0,20**–0,30	ACM100 ACM200
	Titanium		Pure Titanium	(Rm 400)	60–**80**–100	0,10–**0,20**–0,30	
			α + β alloy system	(Rm 1050)	40–**50**–60	0,10–**0,20**–0,30	

Expansion

General Features

The Sumi Dual Mill DFC type employs cost effective double-sided inserts for high toughness and enhanced accuracy.
The double-side inserts are flexible and reduces costs.

Large Line-up

- Diameter from Ø 25 mm to Ø 200 mm
- Available as standard, fine and extra-fine pitch
- Bore diameter: metric
- Insert geometry: L, G, GS, H

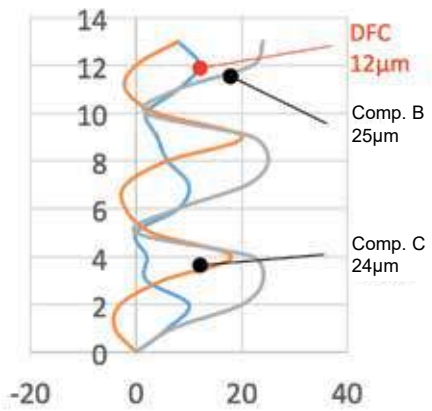
Cutter Body

Type		Cat. No.	Diameter (mm)	No. of Teeth	Image
Shank → H17	Standard Pitch	DFC 09000 E	Ø 25–Ø 80	2–5	
	Medium Pitch	DFCM 09000 E	Ø 32–Ø 80	3–7	
Shell	Standard Pitch	DCF 09000 RS	Ø 50–Ø 200	4–10	
	Medium Pitch	DFCM 09000 RS	Ø 50–Ø 200	5–16	
	Fine Pitch	DFCF 09000 RS	Ø 50–Ø 200	6–20	

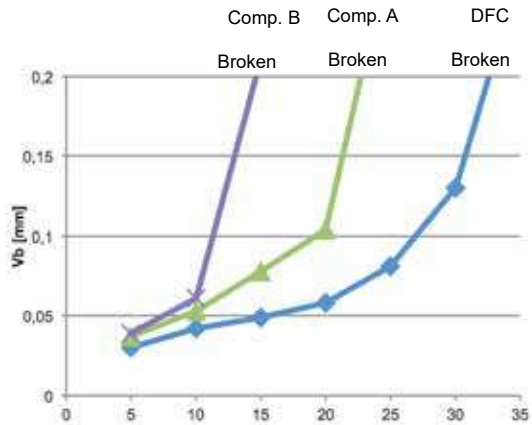
90 Degree Accuracy

Work material: Carbon steel

Cutting conditions:
v_c = 200 m/min, f_z = 0,1 mm/t
a_e = 5,0 mm, a_p = 5,0 mm x 3 passes



Shell type: ø 63 mm



Number of passes (1 pass = 0.30 mm)

Applications and Recommended Chipbreakers

Face milling
G

Shoulder milling
GS

Slot milling

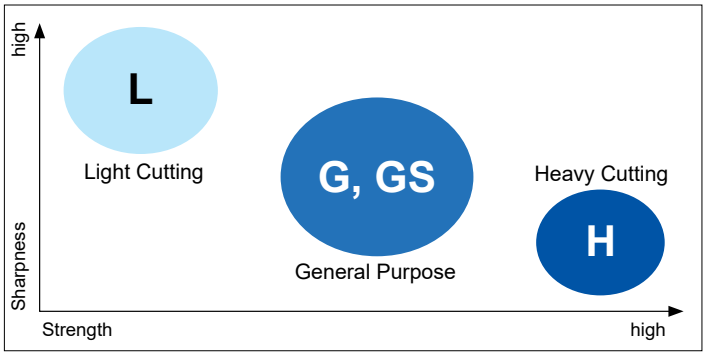
Side face milling
G, GS

● = Euro stock

■ New Insert Design Provides Excellent Machining Accuracy

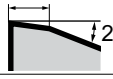
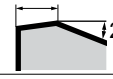
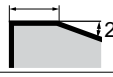
- The new insert design separates the location area and cutting edge producing an optimized solution.
- Machining accuracy is comparable to single sided inserts provided the DOC is less than 3 mm.
- The SEC-Sumi Dual Mill design, equips the user with a highly stable cutter for high feed machining applications.

● Chipbreaker Selection Map



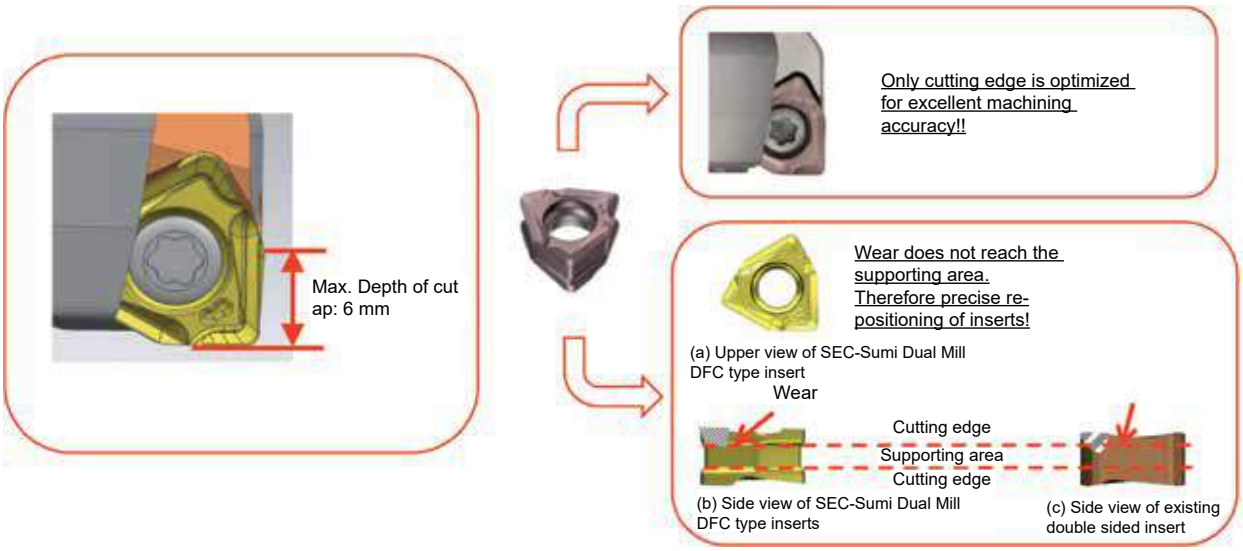
● Inserts

Cat. No.	RE0,4	RE0,8	RE1,2	RE1,6
XNMU0606__PNER-L	●	●		
XNMU0606__PNER-G	●	●	●	●
XNMU0606__PNER-GS Expansion	●	●	●	●
XNMU0606__PNER-H		●	●	●

Work Material	P M K S			
Chipbreaker	L type	G type	GS type	H type
Applications	Light cutting	General purpose to interrupted milling	Shoulder milling	Heavy cutting
Cutting edge geometry	30°	0,1 mm  20°	0,1 mm  20°	0,15 mm  20°
Features	Low rigidity milling, reduction of burrs	Face milling	Shoulder milling	Roughing, heavy interrupted and hardness steel milling

■ Stable and High Cutting Performance Combined with High Toughness

- The excellent cutter performance offers efficient machining, enables high feed rate capability.
- The new insert construction provides extremely accurate edge to edge indexing whilst the location area offers high security and stability.



DFC(M/F) 09000RS

Body – Shell type

Rake Angle	Radial	–9°
	Axial	–5°

Max. a_p: 6 mm

Fig.1

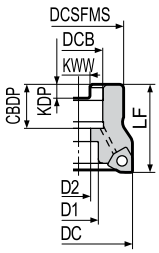


Fig.2

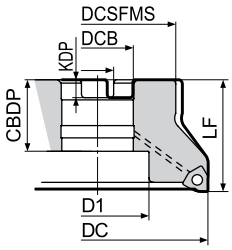
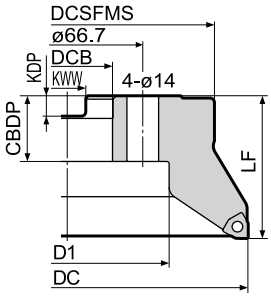


Fig.3



■ Body – Dimensions

● Sumi Dual Mill DFC type, Standard Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
DFC 09050RS	●	50	41	40	22	10,4	6,3	20	18	11	4	0,3	1
09063RS	●	63	50	40	22	10,4	6,3	20	18	11	4	0,5	1
09080RS	●	80	55	50	27	12,4	7	22	20	14	5	1,0	1
DFC 09100RS	●	100	70	50	32	14,4	8	26	46	-	6	1,4	2
09125RS	●	125	80	63	40	16,4	9	29	52	29	7	2,8	1
09160RS	●	160	130	63	40	16,4	9	29	90	-	8	4,6	3
DFC 09200RS	❑	200	150	63	60	25,7	14	35	135	-	10	5,7	

● Sumi Dual Mill DFC type, Medium Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
DFCM 09050RS	●	50	41	40	22	10,4	6,3	20	18	11	5	0,3	1
09063RS	●	63	50	40	22	10,4	6,3	20	18	11	6	0,5	1
09080RS	●	80	55	50	27	12,4	7	22	20	14	7	0,9	1
DFCM 09100RS	●	100	70	50	32	14,4	8	26	46	-	8	1,4	2
09125RS	●	125	80	63	40	16,4	9	29	52	29	11	2,7	1
09160RS	●	160	130	63	40	16,4	9	29	90	-	12	4,5	3
DFCM 09200RS	❑	200	150	63	60	25,7	14	35	135	-	16	5,6	

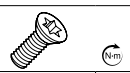
● Sumi Dual Mill DFC type, Fine Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Fig.
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
DFCF 09050RS	●	50	41	40	22	10,4	6,3	20	18	11	6	0,3	1
09063RS	●	63	50	40	22	10,4	6,3	20	18	11	7	0,5	1
09080RS	●	80	55	50	27	12,4	7	22	20	14	9	0,9	1
DFCF 09100RS	●	100	70	50	32	14,4	8	26	46	-	11	1,3	2
09125RS	●	125	80	63	40	16,4	9	29	52	29	14	2,6	1
09160RS	●	160	130	63	40	16,4	9	29	90	-	16	4,6	3
DFCF 09200RS	❑	200	150	63	60	25,7	14	35	135	-	20	5,5	

■ Identification Details

DFC	M	09	050	R	S
Cutter Series	M: Medium F: Fine	Insert Size	Cutter Diameter	Direction	Metric

■ Spare Parts

Screw		Wrench
		
BFTX03512IP	5,0	TRDR15IP

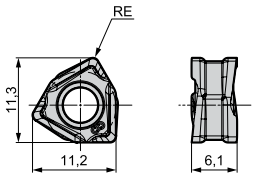
● = Euro stock
❑ = Delivery on request

Recommended Tightening Torque (N·m)

Inserts

Dimensions (mm)

Application	Coated Carbide									
High Speed / Light Cutting	K S M	P K M	P M			K	K		M S	
General Purpose Cutting	K S M	P K M	P M	P M		K	K		M S	M S
Rough Cutting	K S M			P M	P M			K		M S
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
XNMU 060604 PNER-L	●	❍		●	●	❍		●		●	0,4
060608 PNER-L	●	❍		●	●	❍		●		●	0,8
XNMU 060604 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,4
060608 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
060612 PNER-G	●		●	●	●		●	●	●	●	1,2
060616 PNER-G	●		❍	●	●		●	●	●	●	1,6
XNMU 060604 PNER-GS	❍		●	●	●				●	●	0,4
060608 PNER-GS	❍	❍	●	●	●	❍			●	●	0,8
060612 PNER-GS	❍		❍	❍	❍				❍	❍	1,2
060616 PNER-GS	❍		❍	❍	❍				❍	❍	1,6
XNMU 060608 PNER-H	●	❍	●	●	●	❍	●	●	●	●	0,8
060612 PNER-H	●		❍	●	●		●	●	❍	●	1,2
060616 PNER-H	●		❍	●	❍		❍	●	❍	●	1,6



Recommemded Cutting Conditions

Min.–**Optimum**–Max.

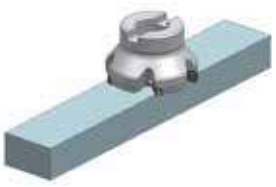
ISO	Work-material	Hardness (HB)	Cutting Speed (m/min)	Feed Rate	Depth of Cut (mm)	Grade
P	General Steel	180–280	150–**200**–250	0,10–**0,20**–0,30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Soft Steel	≤180	180–**250**–350	0,15–**0,25**–0,35	< 6	
	Die Steel	200–220	100–**150**–200	0,10–**0,18**–0,25	< 4	
M	Stainless Steel	–	160–**205**–250	0,12–**0,18**–0,25	< 6	ACU2500 ACM300
K	Cast Iron	250	100–**175**–250	0,10–**0,20**–0,30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	–	30–**50**–80	0,10–**0,20**–0,30	< 6	ACU2500 ACM200 ACM300

Application Examples

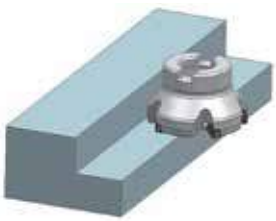
Work piece		Sumitomo	Comp.
Workpiece material: Steel (HRB 269-330)	Breaker	G	
	Grade	ACP200	
	v_c (m/min)	226	200
	v_f (mm/min)	1260	
	f_z (mm/t)	0,28	0,2
	a_p (mm)	2	2
	a_e (mm)	5	5
	Dry or Wet	Wet	Wet
	Tool diam. Ø	80	
	No. of Teeth	5	
	Result	Efficiency: 158 % achieved	
	Evaluation	Wear resistance, efficiency	

Work piece		Sumitomo	Comp.
Workpiece material: S235 (Carbon steel) Face milling	Breaker	G	
	Grade	ACP200	
	v_c (m/min)	180	180
	v_f (mm/min)	1092	910
	f_z (mm/t)	0,3	0,2
	a_p (mm)	2 x 2 mm	2 x 2 mm
	a_e (mm)	50	50
	Dry or Wet	Dry	Dry
	Tool diam. Ø	63 mm	63 mm
	No. of Teeth	4	5
	Result	Efficiency: 120 % achieved	
	Evaluation	Wear resistance, efficiency	

Work piece		Sumitomo	Comp.
Workpiece material: Cast Iron	Breaker	G	
	Grade	ACP200	
	v_c (m/min)	156	156
	v_f (mm/min)	536	404
	f_z (mm/t)	0,17	0,09
	a_p (mm)	2,2	2,2
	a_e (mm)	63,5	63,5
	Dry or Wet	Dry	Dry
	Tool diam. Ø	80 mm	80 mm
	No. of Teeth	5	7
	Result	Efficiency: 133 % achieved Tool life: 138 % achieved	
	Evaluation	Efficiency, tool life	



Work piece		Sumitomo	Comp.
Workpiece material: Cr-Mo alloy	Breaker	G	
	Grade	ACP200	
	v_c (m/min)	200	200
	v_f (mm/min)	838	838
	f_z (mm/t)	0,2	0,13
	a_p (mm)	6	6
	a_e (mm)	43	43
	Dry or Wet	Dry	Dry
	Tool diam. Ø	80 mm	80 mm
	No. of Teeth	5	8
	Result	Efficiency: 120 % achieved	
	Evaluation	Efficiency	

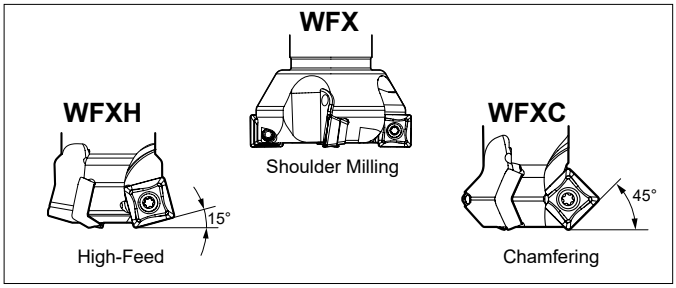


WFX Type

Expansion

General Features

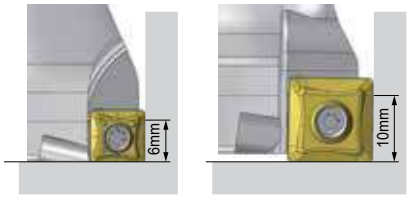
Wave Mill WFX type for shoulder milling is a screw-locking type cutter capable of using four corners.
Ideal cutting edge design delivers good squareness.
Series expansion with the high-feed **WFXH** type and the **WFXC** type for chamfering.
A comprehensive lineup that covers a wide variety of applications.



Characteristics

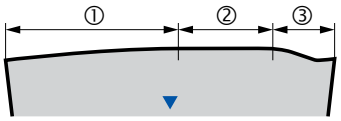
The insert shape, optimized for shoulder milling and combined with a high-precision body, leaves a superior machined surface finish.

● Max. Depth of Cut



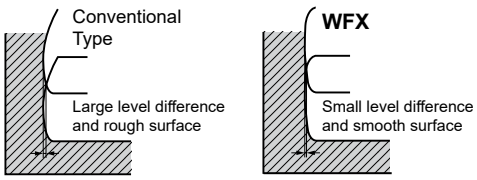
WFX08000 type　　WFX12000 type

● Optimized Edge Shape



① The convex shape ensures the cutting edge strength.

② The flat shape minimises differences in step levels.



③ The wiper edge function improves the surface roughness.

Product Range

Application	Type	Cat. No.	No. of Teeth	Cutter Diameter (mm)	Shape
Shoulder Milling	Shell Type	WFX 08000 RS	3 - 8	40–100	
		WFXM 08000 RS	4 - 10	40–100	
		WFXF 08000 RS	6 - 12	40–100	
		WFX 08000 R	6 - 8	80–100	
		WFXM 08000 R	8 - 10	80–100	
		WFXF 08000 R	10 - 12	80–100	
		WFX 12000 RS	3 - 5	60–100	
		WFXF 12000 RS	4 - 7	60–100	
		WFX 12000 R	4 - 12	80–250	
		WFXF 12000 R	6 - 18	80–250	
	Endmill Type	WFX 08000 E	2 - 5	20–63	→ H18/19
		WFXM 08000 E	3 - 6	25–63	
		WFX 12000 E	3 - 4	40–80	
		WFXF 12000 E	4 - 6	60–80	
	Modular Type	WFX 08000 M	2 - 3	20–40	
High Efficiency	Shell Type	WFXH 08000 RS	4 - 6	40–63	
		WFXH 12000 RS	4 - 5	60– 63	
	Modular Type	WFXH 08000 M	2 - 3	25–32	
		WFXH 12000 M	3	40	→ H14/15
Chamfering	Endmill Type	WFXC 08000 E	1 - 2	8–16	
		WFXC 12000 E	3	25–32	
	Modular Type	WFXC 08000 M	2	16	
		WFXC 12000 M	3	25–32	→ H78-80

Inserts

Cat. No.	RE0,2	RE0,4	RE0,8	RE1,2	RE1,6
SOMT 0803_ _PZER-L		●	●		
0803_ _PZER-G		●	●	●	
0803_ _PZER-H			●	●	
SOET 0803_ _PZER-G		●	●	●	
0803_ _PZFR-S	●	●	●		
SOMT 1204_ _PDER-L			●		
1204_ _PDER-G		●	●	●	●
1204_ _PDER-H			●		
SOET 1204_ _PDFR-S			●		

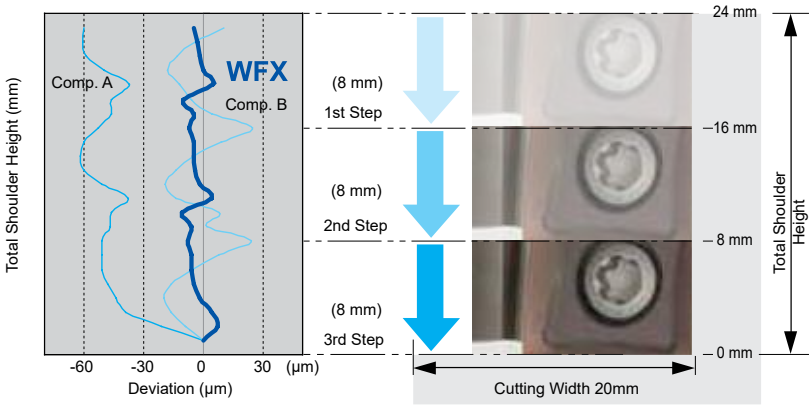
WFX08000 type insert (General Purpose G type chipbreaker)

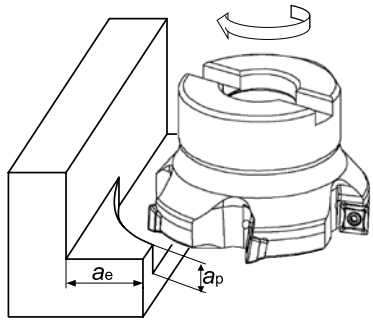
WFX12000 type insert (General Purpose G type chipbreaker)

● = Euro stock

Cutting Performance

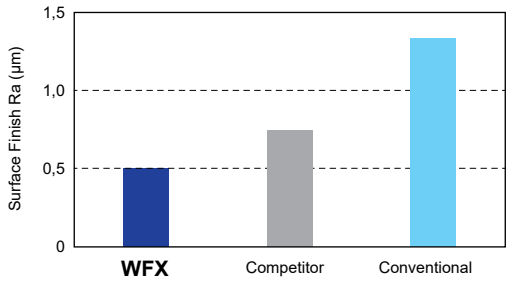
Squareness of Machined Shoulder





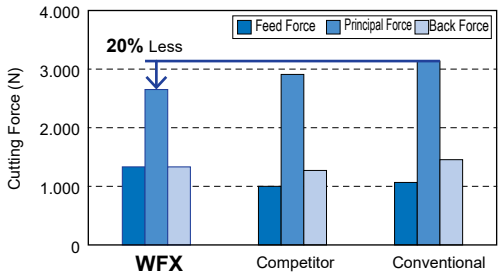
Work Material: C50
Tool: WFX12100RS (Ø 100 mm x 5 teeth)
Cutting Conditions: v_c = 200m/min, a_p = 8,0 mm x 3 times
f_z = 0,15mm/t, a_e = 20 mm

Comparison of Surface Roughness



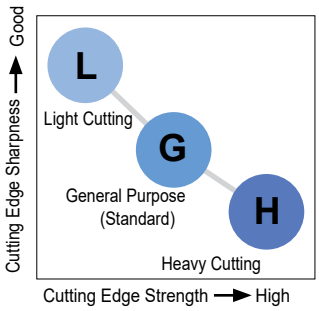
Work Material: 42CrMo4
Tool: WFX12100RS (Ø 100 mm x 5 teeth)
Cutting Conditions: v_c = 200 m/min, a_p = 3,0 mm
f_z = 0,10 mm/t, a_e = 90 mm

Comparison of Cutting Force



Work Material: C50
Tool: WFX12100R (Ø 100 mm x 5 teeth)
Cutting Conditions: v_c = 200 m/min, a_p = 10 mm,
f_z = 0,15 mm/t, a_e = 20 mm

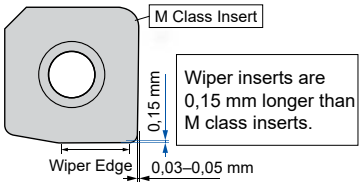
Chipbreaker Selection



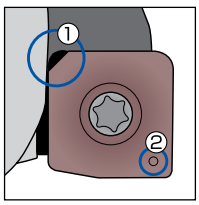
Work Material	P M K S				N
	L Type	G Type	H Type	Wiper Type	S Type
Breaker					
Characteristic	Low Cutting Force	General Purpose	Strong Edge	Wiper Edge	Sharp Edge
08 Type Cross Section	0,05 mm 20°	0,1 mm 15°	0,15 mm 10°	0,18 mm 15°	25°
12 Type Cross Section	0,05 mm 25°	0,1 mm 15°	0,2 mm 15°	0,2 mm 15°	27°
Work Material-Application	Light Cutting Low rigidity Milling Low-Burr Design	**Main Chipbreaker** General to Interrupted Milling	Heavy Cut Heavy Interrupted Machining Tempered Steel	Precision Finishing	Non-Ferrous Metal

Wiper Insert

Optimised wiper edge shape provides superior surface roughness.



Wiper inserts are 0,15 mm longer than M class inserts.



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

WFX(M/F) 08000 RS

Expansion

Body - Shell Type

Rake Angle		
Radial	–6°	6 mm
Axial	12°	90°

WFX08000RS

WFXM08000RS

WFXF08000RS

Fig. 1

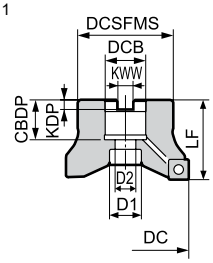
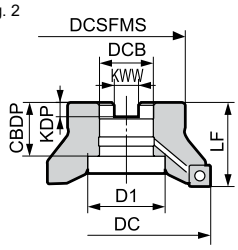


Fig. 2



Body - WFX, Standard Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Figure
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
WFX 08040 RS	●	40	33	40	16	8,4	5,6	18	14	9	3	0,2	1
08050 RS	●	50	41	40	22	10,4	6,3	20	18	11	4	0,3	1
08063 RS	●	63	50	40	22	10,4	6,3	20	18	11	5	0,6	1
08080 RS	●	80*	55	50	27	12,4	7,0	25	20	14	6	1,0	1
WFX 08100 RS	●	100*	70	50	32	14,4	8,0	32	46	-	8	1,4	2

Body - WFXM, Medium Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Figure
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
WFXM 08040 RS	●	40	33	40	16	8,4	5,6	18	14	9	4	0,2	1
08050 RS	●	50	41	40	22	10,4	6,3	20	18	11	5	0,3	1
08063 RS	●	63	50	40	22	10,4	6,3	20	18	11	6	0,5	1
08080 RS	●	80*	55	50	27	12,4	7,0	25	20	14	8	1,0	1
WFXM 08100 RS	●	100*	70	50	32	14,4	8,0	32	46	-	10	1,4	2

Body - WFXF, Fine Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Figure
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
WFXF 08040 RS	●	40	33	40	16	8,4	5,6	18	14	9	6	0,2	1
08050 RS	●	50	41	40	22	10,4	6,3	20	18	11	7	0,3	1
08063 RS	●	63	50	40	22	10,4	6,3	20	18	11	8	0,5	1
08080 RS	●	80*	55	50	27	12,4	7,0	25	20	14	10	0,9	1
WFXF 08100 RS	●	100*	70	50	32	14,4	8,0	32	46	-	12	1,4	2

Inserts are not included.

*Please use JIS B1176 hexagonal bolt (Ø80: M12x30~35mm, Ø100: M16x40~45mm) for securing Ø80 / Ø100 cutter on the arbor.

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Cutting Speed	Feed Rate	DOC	Grades
P	General Steel	180–280	150–**200**–250	0,08–**0,12**–0,18	<6	ACU2500 ACP200 ACP300 XCU2500
	Soft Steel	≤180	180–**250**–350	0,10–**0,15**–0,20	<6	
	Die Steel	200–220	100–**150**–200	0,08–**0,12**–0,18	<4	
M	Stainless Steel	-	160–**200**–250	0,10–**0,15**–0,20	<6	ACU2500 ACM300
K	Cast Iron	250	100–**175**–250	0,10–**0,15**–0,20	<6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non Ferrous Metal	-	300–**500**–1000	0,10–**0,15**–0,20	<6	H1 DL1000
S	Exoric Alloy	-	30–**50**–80	0,08–**0,13**–0,18	<6	ACU2500 ACM200 ACM300

Min. - **Optimum** - Max.

Identification Details

WFX	F	08	040	R	S
Cutter Series	M: Medium Pitch F: Fine Pitch	Insert Size	Cutter Diameter	Direction	Metric Type

Spare Parts

Screw		Wrench
	N·m	
BFTX0306IP	2,0	TRDR08IP

Inserts

Dimensions (mm)

Fig. 3

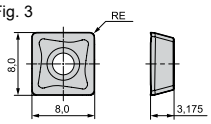
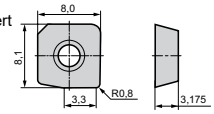


Fig. 4
Wiper Insert



Application	Coated Carbide										Carbide	DLC		
High Speed / Light cut	K S M	P K M	P			K	K		M S		K N	N		
General Purpose	K S M	P K M		P M	P M	K	K		M S	M S		N		
Roughing	K S M			P M	P M			K		M S				
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	RE	Fig.
SOMT 080304 PZER L	●	❍	●	●	❍	❍	❍	●	●	●	–	–	0,4	3
080308 PZER L	●	❍	❍	●	●	❍	●	●	●	●	–	–	0,8	3
SOMT 080304 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,4	3
080308 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
080312 PZER G	●		●	●	●		❍	●	●	●	–	–	1,2	3
SOMT 080308 PZER H	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
080312 PZER H	●		●	●	●		❍	●	❍	●	–	–	1,2	3
SOET 080304 PZER G	●		❍	❍	❍		❍	●	●	❍	–	–	0,4	3
080308 PZER G	●		❍	❍	❍		❍	●	●	❍	–	–	0,8	3
080312 PZER G	●		❍	●	❍		❍	●	❍	❍	–	–	1,2	3
SOET 080302 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,2	3
080304 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,4	3
080308 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,8	3
XOEW 080308 PZTR W	●	–	–	–	–	–		●			–	–	0,8	4

● = Euro stock
❍ = Japan stock

N·m Recommended Tightening Torque (N·m)

WFX(F) 12000 RS

Body - Shell Type

Rake Angle		
	Radial	–8°
	Axial	8°

10 mm

90°

WFX 12000RS

WFXF12000RS

Fig. 1

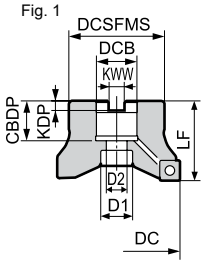


Fig. 2

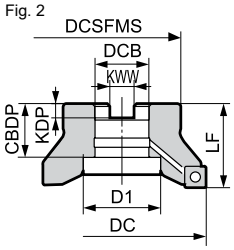
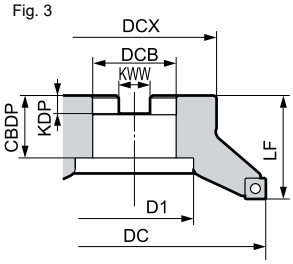


Fig. 3



Body - WFX, Standard Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Figure
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
WFX 12050 RS	●	50	40	40	22	10,4	6,3	20	18	11	3	0,2	1
12063 RS	●	63	50	40	22	10,4	6,3	20	18	11	4	0,4	1
12080 RS	●	80*	60	50	27	12,4	7,0	25	20	13,5	4	0,9	1
WFX 12100 RS	●	100*	70	50	32	14,4	8,5	32	46	-	5	1,3	2
12125 RS	●	125	90	63	40	16,4	9,5	29	52	-	6	2,7	2
12160 RS	●	160	130	63	40	16,4	9,5	29	88	-	8	4,8	3

Body - WFXF, Fine Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Figure
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
WFXF 12050 RS	●	50	40	40	22	10,4	6,3	20	18	11	4	0,2	1
12063 RS	●	63	50	40	22	10,4	6,3	20	18	11	5	0,4	1
12080 RS	●	80*	60	50	27	12,4	7,0	25	20	13,5	6	0,9	1
WFXF 12100 RS	●	100*	70	50	32	14,4	8,5	32	46	-	7	1,2	2
12125 RS	●	125	90	63	40	16,4	9,5	29	52	-	8	2,6	2
12160 RS	●	160	130	63	40	16,4	9,5	29	88	-	12	4,7	3

Inserts are not included.
*Please use JIS B1176 hexagonal bolt (Ø80: M12x30~35mm, Ø100: M16x40~45mm) for securing Ø80 / Ø100 cutter on the arbor.
Cutters ≥ Ø160 do not have coolant holes.

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Cutting Speed	Feed Rate	DOC	Grades
P	General Steel	180–280	150–**200**–250	0,10–**0,15**–0,20	<10	ACU2500 ACP200 ACP300 XCU2500
	Soft Steel	≤180	180–**250**–350	0,10–**0,15**–0,20	<10	
	Die Steel	200–220	100–**150**–200	0,10–**0,15**–0,20	<6	
M	Stainless Steel	-	160–**200**–250	0,10–**0,15**–0,20	<10	ACU2500 ACM300
K	Cast Iron	250	100–**175**–250	0,10–**0,15**–0,20	<10	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non Ferrous Metal	-	300–**500**–1000	0,10–**0,15**–0,20	<10	H1 DL1000
S	Exotic Alloy	-	30–**50**–80	0,10–**0,15**–0,20	<10	ACU2500 ACM200 ACM300

Min. - **Optimum** - Max.

Identification Details

WFX	F	12	050	R	S
Cutter Series	F: Fine Pitch	Insert Size	Cutter Diameter	Direction	Metric Type

Inserts

Dimensions (mm)

Fig. 3

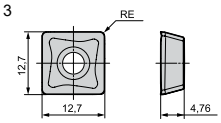
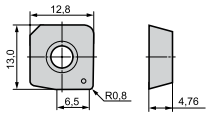


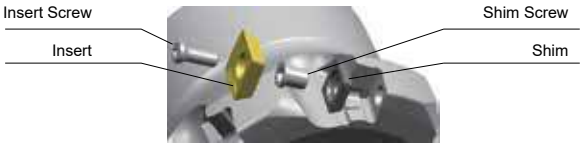
Fig. 4
Wiper Insert



Application	Coated Carbide										Carbide	DLC		
High Speed / Light cut	K M S	P K M	P			K	K		M S		K N	N		
General Purpose	K M S	P K M		P M	P M	K	K		M S	M S		N		
Roughing	K M S			P M	P M			K		M S				
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	RE	Fig.
SOMT 120408 PDER L	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
SOMT 120404 PDER G	●	❍	❍	●	●	❍	●	●	●	●	–	–	0,4	3
120408 PDER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
120412 PDER G	●		❍	●	❍		●	❍	❍	●	–	–	1,2	3
120416 PDER G	●		●	●	●		❍	❍	❍	❍	–	–	1,6	3
SOMT 120408 PDER H	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
SOET 120408 PDFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,8	3
XOEW 120408 PDTR W	●	–	–	–	–	–	–	❍	–	–	–	–	–	4

Spare Parts

Shim	Shim Screw	Insert Screw		Insert Wrench	Wrench (Shim)
WFXS4R	BW0507F	BFTX03512IP	3,0	TRDR15IP	LH035



”Sumi Dual Mill” Series
TSX Type

Expansion

■ General Features

High-efficient and high precision tangential shoulder milling cutter with tangentially mounted carbide inserts.

■ Characteristics

- **Tough & Sharp cutting edge**
  Tangentially mounted carbide insert design and optimized edge geometry realize extremely tough and sharp cutting action.

- **Very accurate and excellent surface finish**
  Thanks to newly developed fine carbide press / sintering technology and very accurate grinding technics, very periphery ground inserts generate very accurate and excellent surface finish.

- **Wide product range**
  2 different insert size series, 3 chip breaker range and various carbide grade combination offers wide range of machining application.

■ Product Range

Shoulder Milling Cutter

	Cat. No.	Series	Diameter Range / No of Teeth														Shape
			Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160	Ø200	Ø250	Ø315	
Shell Type	TSX 08000RS	Standard Pitch					4	5	6	7							
	TSXF 08000RS	Fine Pitch					6	8	10	11							
	TSX 13000RS	Standard Pitch					3	4	5	5	6	7	8	12	14	16	
	TSXM 13000RS	Medium Pitch					4	5	6	7	8	10	12	16	20	24	
	TSXF 13000RS	Fine Pitch					5	6	7	8	10	14	16				
Shank Type	TSX 08000E	Standard Pitch	2	2*	3*	3*	4	5	6	7							
	TSXF 08000E	Fine Pitch		3	4	5	6	8	10	11							
	TSX 13000E	Standard Pitch			2	2	3	4	5	5							
	TSXM 13000E	Medium Pitch				3	4	5	6	7							
	TSXF 13000E	Fine Pitch					5	6	7	8							→ H20-23

* Different shank diameters in stock

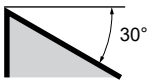
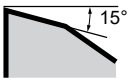
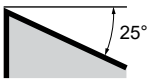
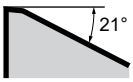
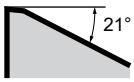
TSXR - Repeater

New

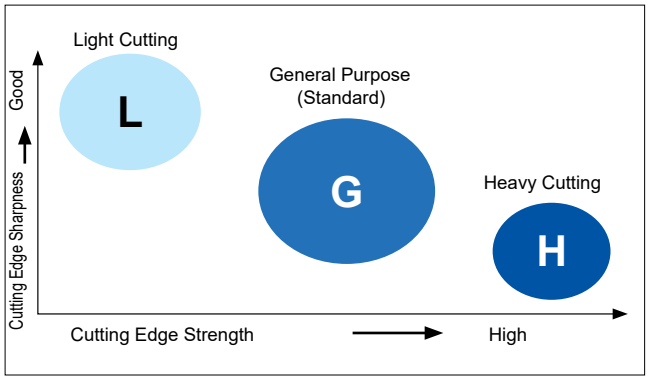
Type	Cat. No.	Diameter Range / No of Teeth														Shape
		Ø16	Ø20	Ø25	Ø32	Ø40	Ø50		Ø63		Ø80		Ø100		Ø125	
Shell	TSXR 08000RS				2	3	3	4	5							
	TSXR 13000RS					2	3		3	4	4	5	5	6	7	
Shank	TSXR 08000E		1	2	2	3										
	TSXR 13000E					2	3									→ H24-25

● = Euro stock

Chipbreaker Lineup

Work Material	P M K S		
Chipbreaker	L type	G type	H type
Feature	Low cutting force	General purpose	Strong edge
LNEX08 Cutting edge geometry			–
LNEX13 Cutting edge geometry			
Application	Light cut, low rigidity milling and reduced burrs	Main breaker for general purpose applications	Roughing, heavy interrupted and hardness steel milling

Chipbreaker Selection

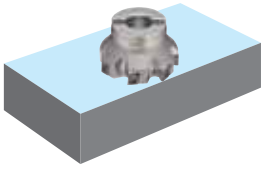


Inserts

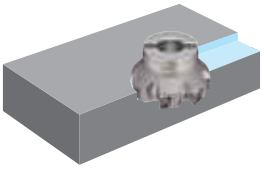
Cat. No.	RE0,4	RE0,8	RE1,2	RE1,6	RE2,4	RE3,2
LNEX0804__PNER-L	●	●				
LNEX0804__PNER-G	●	●	●	●		
LNEX1306__PNER-L	●	●				
LNEX1306__PNER-G		●		●	●	●
LNEX1306__PNER-H	●	●		●	●	●

Suitable Applications

Face milling



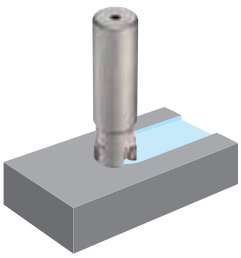
Shoulder milling



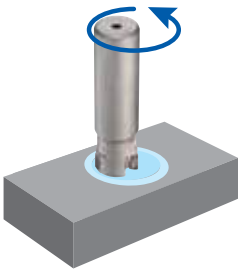
Side face milling

Slot milling

Recommended
≤ ø32 mm



Hole expansion milling

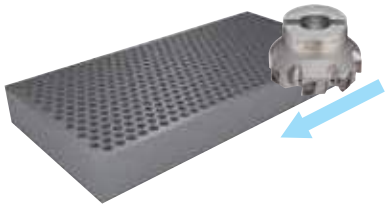


Toughness

TSX type has extremely stable cutting edge.

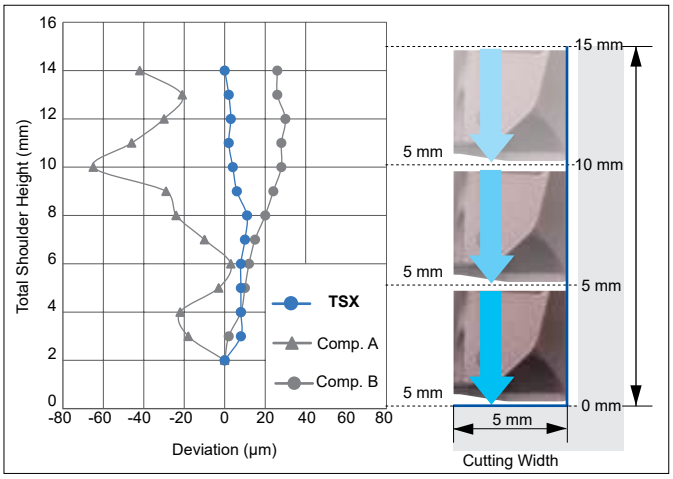
Cutting Length	4 Passes	8 Passes	12 Passes
TSX	Available	Available	Available
Competitor A	Breakage	Breakage	
Competitor B	Breakage		

Machine: M/C BT-50, vertical Work Material: C50
Tool: TSX13100RS Insert: LNEX130608PNER-G (ACP200)
Cutting Conditions:
v_c = 150 m/min, f_z = 0,6 mm/t, a_p = 3 mm, a_e = 40 mm, dry



Squareness of Machined Shoulder

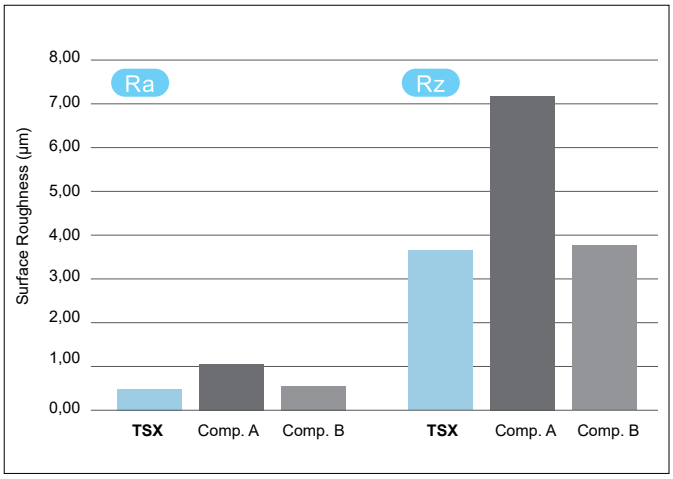
TSX type shows excellent squareness due to ground insert and optimized design.



Machine: M/C BT-50, vertical Work Material: Carbon Steel
Tool: TSX13100RS Insert: LNEX130608PNER-G (ACP200)
Cutting Conditions:
v_c = 200 m/min, f_z = 0,2 mm/t, a_p = 5 mm x 3 passes, a_e = 5 mm, dry

Surface Finish

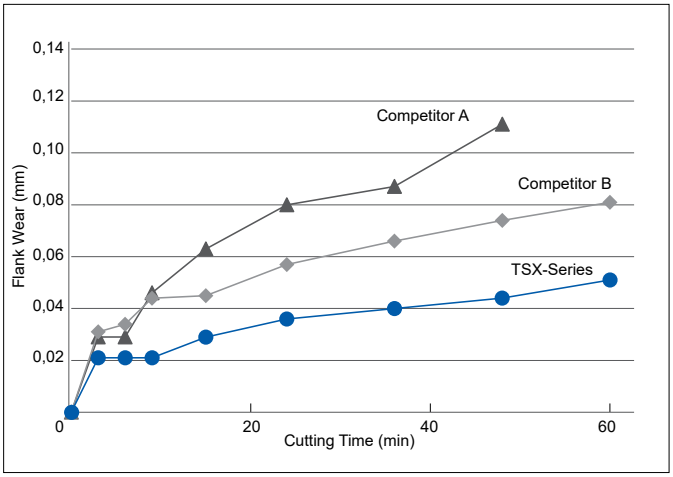
TSX type shows excellent surface roughness.



Machine: M/C BT-50, vertical Work Material: C50
Tool: TSX13100RS Insert: LNEX130608PNER-G (ACP200)
Cutting Conditions:
v_c = 200 m/min, f_z = 0,2 mm/t, a_p = 3 mm, a_e = 60 mm, dry

Tool Life

Longer tool life and stability due to superior wear resistance.



Machine: M/C BT-50, vertical Work Material: C50
Tool: TSX08025E Insert: LNEX080408PNER-G (ACP200)
Cutting Conditions:
v_c = 200 m/min, f_z = 0,10 mm/t, a_p = 2 mm, a_e = 5 mm

TSX-Series
(After 60 minutes)

Competitor A
(After 48 minutes)

Competitor B
(After 60 minutes)

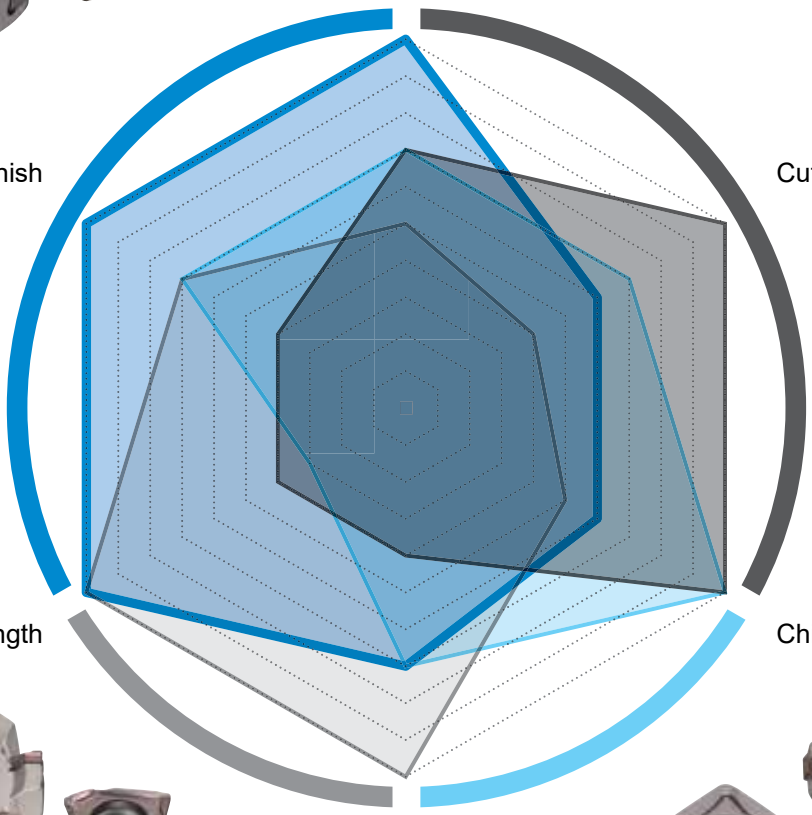
■ Shoulder Milling Tool Selection Guide

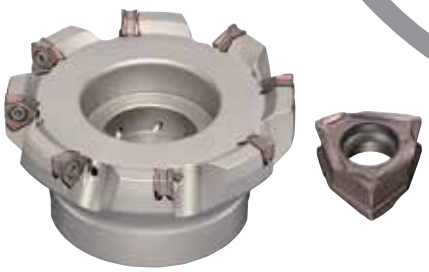
TSX Series – Accuracy

Ground insert

WEX Series – Sharpness

High rake wave cutting edge





DFC Series – Economical

Six-cornered double side insert

WFX Series – General Purpose

Four-cornered single side insert

★★★ Top recommendation

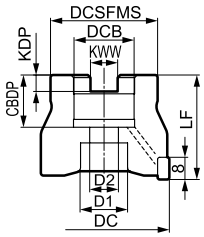
	Surface Finish	Shoulder Accuracy	Cutting Force	Chip Control	Number of Corners	Cutting edge Strength
TSX Series	★★★	★★★	★★	★½	★★	★★★
DFC Series	★★	★	★	★½	★★★	★★★
WEX Series	★	★★	★★★	★★★	★	★★
WFX Series	★★	★★	★★	★★★	★★	★

TSX(F) 08000 RS

Expansion

Rake Angle	Radial	–20°	8 mm	90°
	Axial	–6°		

Body - Shell Type



● Body - TSX, Standard Pitch

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2		
TSX 08040 RS	●	40	33	40	16	8,4	5,6	18	14	9	4	0,21
08050 RS	●	50	41	40	22	10,4	6,3	20	18	11	5	0,30
08063 RS	●	63	50	40	22	10,4	6,3	20	18	11	6	0,53
08080 RS	●	80*	55	50	27	12,4	7,0	22	20	14	7	0,99

Check the arbor attachement size (DCB) when selecting the cutter. Inserts are not included.
* Please use JIS B1176 hexagonal bolt (M12x30 to 35 mm) for securing a Ø 80 mm cutter to the arbor.

● Body - TSXF, Fine Pitch

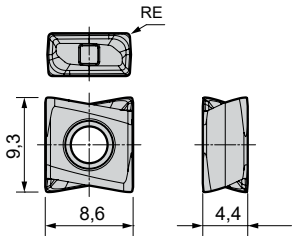
Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2		
TSXF 08040 RS	●	40	33	40	16	8,4	5,6	18	14	9	6	0,21
08050 RS	●	50	41	40	22	10,4	6,3	20	18	11	8	0,31
08063 RS	●	63	50	40	22	10,4	6,3	20	18	11	10	0,54
08080 RS	●	80*	55	50	27	12,4	7,0	22	20	14	11	0,97

Check the arbor attachement size (DCB) when selecting the cutter. Inserts are not included.
* Please use JIS B1176 hexagonal bolt (M12x30 to 35 mm) for securing a Ø 80 mm cutter to the arbor.

Inserts

Dimensions (mm)

Application	Coated Carbide									
High Speed / Light Cutting	P S	P K M	P M			K	K		M S	
General Purpose Cutting	P S	P K M	P M	P M		K	K		M S	M S
Rough Cutting	P S			P M	P M			K		M S
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 080404 PNER-L	●			●	❍		❍	●	❍	●	0,4
080408 PNER-L	●			●	❍		❍	●	❍	●	0,8
080412 PNER-L	❍			❍				❍	❍	❍	1,2
080416 PNER-L	❍			❍				❍	❍	❍	1,6
LNEX 080404 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
080408 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
080412 PNER-G	●		❍	●	●		●	●	❍	●	1,2
080416 PNER-G	●		❍	●	●		●	●	❍	●	1,6



Recommended Cutting Conditions

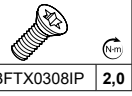
Min. - **Optimum** - Max.

ISO	Work-material	Hardness (HB)	Cutting Speed v_c (m/min)	TSX 08000 Feed Rate f_t (mm/T)	TSX 13000 Feed Rate f_t (mm/T)	Grade
P	Carbon Steel	180–280	150–**225**–300	0,08–**0,20**–0,30	0,10–**0,30**–0,40	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280	75–**150**–230	0,08–**0,20**–0,30	0,10–**0,30**–0,40	
	Alloy Steel	180–280	100–**175**–250	0,08–**0,15**–0,25	0,10–**0,25**–0,35	
M	Stainless Steel	220–280	90–**135**–180	0,08–**0,15**–0,25	0,10–**0,20**–0,30	ACU2500 ACM200 ACM300
		>280	75–**125**–170	0,08–**0,15**–0,25	0,10–**0,20**–0,30	
K	Cast Iron Ductile Cast Iron	250	100–**175**–250	0,08–**0,20**–0,30	0,10–**0,30**–0,40	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Material	–	30–**60**–90	0,05–**0,10**–0,15	0,05–**0,15**–0,20	ACU2500 ACM200 ACM300

Identification Details

TSX	F	08	050	R	S
Cutter Series	F: Fine Pitch	Insert Size	Cutter Diameter	Direction	Metric Type

Spare Parts

Screw		Wrench
		
BFTX0308IP	2,0	TRDR08IP

● = Euro stock
❍ = Japan stock

Recommended Tightening Torque (N·m)

”Sumi Dual Mill” Series
TSX 13000 RS

Rake Angle	Radial	-23°– -15°	12 mm	90°
	Axial	-6°		

■ Shell Type

Fig. 1

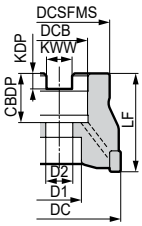


Fig. 2

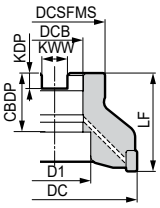
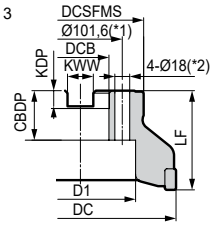
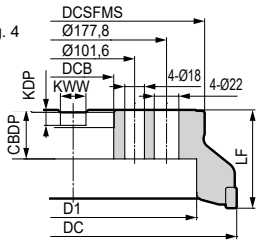


Fig. 3



In case of TSX 13160RS
*1: Ø 66,7 / *2: 4–Ø 14

Fig. 4



● Body - TSX, Standard Pitch

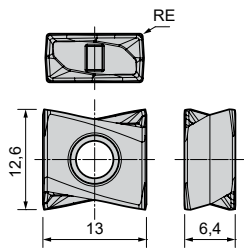
Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Figure
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
TSX 13040 RS	●	40	33	40	16	8,4	5,6	18	14	9	3	0,20	1
13050 RS	●	50	41	40	22	10,4	6,3	20	18	11	4	0,30	1
13063 RS	●	63	50	40	22	10,4	6,3	20	18	11	5	0,50	1
13080 RS	●	80*	55	50	27	12,4	7,0	22	20	14	5	0,92	1
13100 RS	●	100*	70	50	32	14,4	8,0	32	46	–	6	1,35	2
13125 RS	●	125	80	63	40	16,4	9,0	29	52	29	7	2,55	1
13160 RS	●	160	130	63	40	16,4	9,0	29	90	–	8	4,97	3*
13200 RS	●	200	160	63	60	25,7	14,0	35	135	–	12	6,20	3
13250 RS	●	250	180	63	60	25,7	14,0	35	160	–	14	9,35	3
13315 RS	❍	315	240	63	60	25,7	14,0	35	230	–	16	16,42	4

Check the arbor attachement size (DCB) when selecting the cutter. Inserts are not included.
*Please use JIS B1176 hexagonal bolt (Ø 80: M12x30 to 35 mm, Ø 100: M16 x 40 to 45 mm) for securing Ø 80 / Ø 100 cutter on the arbor.

■ Inserts

Dimensions (mm)

Application	Coated Carbide									
High Speed / Light Cutting	K M S	P K M	P M			K	K		M S	
General Purpose Cutting	K M S	P K M	P M	P M		K	K		M S	M S
Rough Cutting	K M S			P M	P M			K		M S
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 130604 PNER-L	●			●	❍		❍	●	❍	●	0,4
130608 PNER-L	●			●	❍		❍	●	❍	●	0,8
130612 PNER-L	❍			●				●	●	●	1,2
130616 PNER-L	❍			❍				❍	❍	❍	1,6
130620 PNER-L	❍			❍				❍	❍	❍	2,0
130624 PNER-L	❍			❍				❍	❍	❍	2,4
130632 PNER-L	❍			❍				❍	❍	❍	3,2
LNEX 130604 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
130608 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
130612 PNER-G	❍		●	●	●		●	●	●	●	1,2
130616 PNER-G	●		❍	●	●		●	●	❍	●	1,6
130620 PNER-G	❍		❍	❍	❍		❍	❍	❍	❍	2,0
130624 PNER-G	●		❍	●	●		●	●	❍	●	2,4
130632 PNER-G	●		❍	●	●		●	●	❍	●	3,2
LNEX 130604 PNER-H	❍			❍	❍		❍	❍			0,4
130608 PNER-H	●	❍		●	●	❍	●	●			0,8
130612 PNER-H	❍			●	●		●	●			1,2
130616 PNER-H	●			●	●		●	●			1,6
130620 PNER-H	❍			❍	❍		❍	❍			2,0
130624 PNER-H	●			●	●		●	●			2,4
130632 PNER-H	●			●	●		●	●			3,2



■ Recommended Cutting Conditions

→ G34

■ Identification Details

TSX	13	100	R	S
Cutter Series	Insert Size	Cutter Diameter	Direction	Metric Type

■ Spare Parts

Screw		Wrench
BFTX03510IP	3,0	TRDR15IP

TSXM 13000 RS

Expansion

Rake Angle	Radial	-23°– -15°	12 mm	90°
	Axial	-6°		

Shell Type

Fig. 1

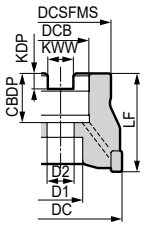


Fig. 2

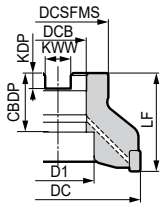
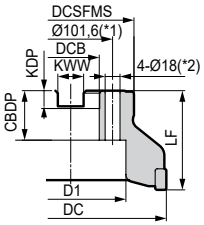
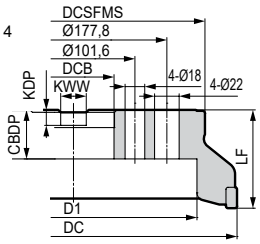


Fig. 3



In case of TSX 13160RS
*1: Ø66,7 / *2: 4-Ø14

Fig. 4



● Body - TSXM, Medium Pitch

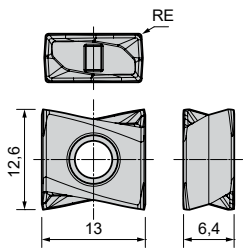
Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Figure
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
TSXM 13040 RS	●	40	33	40	16	8,4	5,6	18	14	9	4	0,19	1
13050 RS	●	50	41	40	22	10,4	6,3	20	18	11	5	0,28	1
13063 RS	●	63	50	40	22	10,4	6,3	20	18	11	6	0,50	1
13080 RS	●	80*	55	50	27	12,4	7,0	22	20	14	7	0,92	1
13100 RS	●	100*	70	50	32	14,4	8,0	32	46	–	8	1,36	2
13125 RS	●	125	80	63	40	16,4	9,0	29	52	29	10	2,57	1
13160 RS	●	160	130	63	40	16,4	9,0	29	90	–	12	5,02	3*
13200 RS	●	200	160	63	60	25,7	14,0	35	135	–	16	6,32	3
13250 RS	●	250	180	63	60	25,7	14,0	35	160	–	20	9,42	3
13315 RS	❍	315	240	63	60	25,7	14,0	35	230	–	24	16,37	4

Check the arbor attachement size (DCB) when selecting the cutter. Inserts are not included.
*Please use JIS B1176 hexagonal bolt (Ø 80: M12x30 to 35 mm, Ø 100: M16 x 40 to 45 mm) for securing Ø 80 / Ø 100 cutter on the arbor.

Inserts

Dimensions (mm)

Application	Coated Carbide									
High Speed / Light Cutting	P S M	P K M	P M			K	K		M S	
General Purpose Cutting	P S M	P K M	P M	P M		K	K		M S	M S
Rough Cutting	K M			P M	P M			K		M S
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 130604 PNER-L	●			●	❍		❍	●	❍	●	0,4
130608 PNER-L	●			●	❍		❍	●	❍	●	0,8
130612 PNER-L	❍			●				●	●	●	1,2
130616 PNER-L	❍			❍				❍	❍	❍	1,6
130620 PNER-L	❍			❍				❍	❍	❍	2,0
130624 PNER-L	❍			❍				❍	❍	❍	2,4
130632 PNER-L	❍			❍				❍	❍	❍	3,2
LNEX 130604 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
130608 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
130612 PNER-G	❍		●	●	●		●	●	●	●	1,2
130616 PNER-G	●		❍	●	●		●	●	❍	●	1,6
130620 PNER-G	❍		❍	❍	❍		❍	❍	❍	❍	2,0
130624 PNER-G	●		❍	●	●		●	●	❍	●	2,4
130632 PNER-G	●		❍	●	●		●	●	❍	●	3,2
LNEX 130604 PNER-H	❍			❍	❍		❍	❍			0,4
130608 PNER-H	●	❍		●	●	❍	●	●			0,8
130612 PNER-H	❍			●	●		●	●			1,2
130616 PNER-H	●			●	●		●	●			1,6
130620 PNER-H	❍			❍	❍		❍	❍			2,0
130624 PNER-H	●			●	●		●	●			2,4
130632 PNER-H	●			●	●		●	●			3,2



Recommended Cutting Conditions

→ G34

Identification Details

TSX	M	13	100	R	S
Cutter Series	M: Medium Pitch	Insert Size	Cutter Diameter	Direction	Metric Type

Spare Parts

Screw		Wrench
	N·m	
BFTX03510IP	3,0	TRDR15IP

● = Euro stock
❍ = Japan stock

N·m Recommended Tightening Torque (N·m)

Rake Angle	Radial	-23°– -15°	12 mm	90°
	Axial	-6°		

Shell Type

Fig. 1

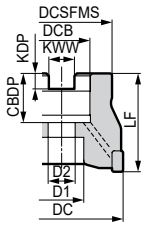


Fig. 2

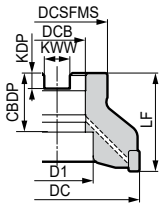
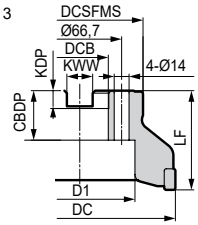


Fig. 3



● Body - TSXF, Fine Pitch

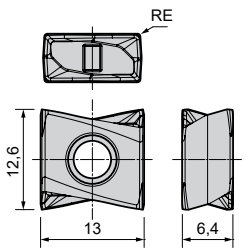
Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)	Figure
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
TSXF 13040 RS	●	40	33	40	16	8,4	5,6	18	14	9	5	0,18	1
13050 RS	●	50	41	40	22	10,4	6,3	20	18	11	6	0,29	1
13063 RS	●	63	50	40	22	10,4	6,3	20	18	11	7	0,50	1
13080 RS	●	80*	55	50	27	12,4	7,0	22	20	14	8	0,92	1
13100 RS	●	100*	70	50	32	14,4	8,0	32	46	–	10	1,34	2
13125 RS	●	125	80	63	40	16,4	9,0	29	52	29	14	2,58	1
13160 RS	●	160	130	63	40	16,4	9,0	29	90	–	16	5,08	3

Check the arbor attachement size (DCB) when selecting the cutter. Inserts are not included.
*Please use JIS B1176 hexagonal bolt (Ø 80: M12x30 to 35 mm, Ø 100: M16 x 40 to 45 mm) for securing Ø 80 / Ø 100 cutter on the arbor.

Inserts

Dimensions (mm)

Application	Coated Carbide									
High Speed / Light Cutting	S M	P K M	P M			K	K		M S	
General Purpose Cutting	S M	P K M	P M	P M		K	K		M S	M S
Rough Cutting	S M			P M	P M			K		M S
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 130604 PNER-L	●			●	❍		❍	●	❍	●	0,4
130608 PNER-L	●			●	❍		❍	●	❍	●	0,8
130612 PNER-L	❍			●				●	●	●	1,2
130616 PNER-L	❍			❍				❍	❍	❍	1,6
130620 PNER-L	❍			❍				❍	❍	❍	2,0
130624 PNER-L	❍			❍				❍	❍	❍	2,4
130632 PNER-L	❍			❍				❍	❍	❍	3,2
LNEX 130604 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
130608 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
130612 PNER-G	❍		●	●	●		●	●	●	●	1,2
130616 PNER-G	●		❍	●	●		●	●	❍	●	1,6
130620 PNER-G	❍		❍	❍	❍		❍	❍	❍	❍	2,0
130624 PNER-G	●		❍	●	●		●	●	❍	●	2,4
130632 PNER-G	●		❍	●	●		●	●	❍	●	3,2
LNEX 130604 PNER-H	❍			❍	❍		❍	❍			0,4
130608 PNER-H	●	❍		●	●	❍	●	●			0,8
130612 PNER-H	❍			●	●		●	●			1,2
130616 PNER-H	●			●	●		●	●			1,6
130620 PNER-H	❍			❍	❍		❍	❍			2,0
130624 PNER-H	●			●	●		●	●			2,4
130632 PNER-H	●			●	●		●	●			3,2



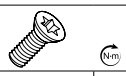
Recommended Cutting Conditions

→ G34

Identification Details

TSX	F	13	100	R	S
Cutter Series	F: Fine Pitch	Insert Size	Cutter Diameter	Direction	Metric Type

Spare Parts

Screw		Wrench
		
BFTX03510IP	3,0	TRDR15IP

TSXR 08000 RS

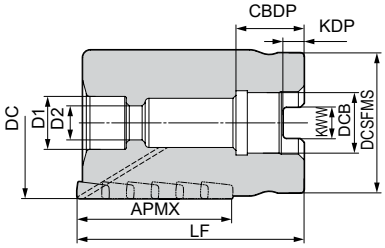
Expansion

Repeater

Rake Angle	Radial	-20°– -15°
	Axial	-6° – -3°

34-60 mm 90°

Shell Type



Body - TSXR

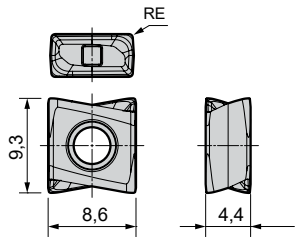
Cat. No.	Stock	Dimensions (mm)										No. of Teeth	Steps	Effective Teeth
		DC	APMX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
TSXR 08032RS3416Z02	❍	32	34	33	55	16,0	8,4	5,6	18,0	14	9	10	5	2
08040RS4016Z03	❍	40	40	37	60	16,0	8,4	5,6	18,0	14	9	18	6	3
08050RS5422Z03	❍	50	54	47	75	22,0	10,4	6,3	20,0	18	11	24	8	3
08050RS5422Z04	❍	50	54	47	75	22,0	10,4	6,3	20,0	18	11	32	8	4
08063RS6027Z05	❍	63	60	60	80	27,0	12,4	7,0	22,0	20	14	45	9	5

Inserts are not included.

Inserts

Dimensions (mm)

Application	Coated Carbide										
High Speed / Light Cutting	S	M	M			K	K		S		
General Purpose Cutting	S	M	M	M		K	K		S	S	
Rough Cutting	S			M	M			K		S	
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 080404 PNER-L	●			●	❍		❍	●	❍	●	0,4
080408 PNER-L	●			●	❍		❍	●	❍	●	0,8
080412 PNER-L	❍			❍				❍	❍	❍	1,2
080416 PNER-L	❍			❍				❍	❍	❍	1,6
LNEX 080404 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
080408 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
080412 PNER-G	●		❍	●	●		●	●	❍	●	1,2
080416 PNER-G	●		❍	●	●		●	●	❍	●	1,6



Recommended Cutting Conditions

Min. - **Optimum** - Max.

ISO	Work-material	Hardness (HB)	Cutting Speed v_c (m/min)	TSX 08000 Feed Rate f_t (mm/T)	TSX 13000 Feed Rate f_t (mm/T)	Grade
P	Carbon Steel	180–280	150–**225**–300	0,08–**0,20**–0,30	0,10–**0,30**–0,40	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280	75–**150**–230	0,08–**0,20**–0,30	0,10–**0,30**–0,40	
	Alloy Steel	180–280	100–**175**–250	0,08–**0,15**–0,25	0,10–**0,25**–0,35	
M	Stainless Steel	220–280	90–**135**–180	0,08–**0,15**–0,25	0,10–**0,20**–0,30	ACU2500 ACM200 ACM300
		>280	75–**125**–170	0,08–**0,15**–0,25	0,10–**0,20**–0,30	
K	Cast Iron Ductile Cast Iron	250	100–**175**–250	0,08–**0,20**–0,30	0,10–**0,30**–0,40	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Material	–	30–**60**–90	0,05–**0,10**–0,15	0,05–**0,15**–0,20	ACU2500 ACM200 ACM300

Identification Details

TSXR	08	050	R	S	54	22	Z03
Cutter Series	Insert Size	Cutter Diameter	Direction	Metric Type	Max. Depth of Cut	Bore Diameter	Effective Teeth

Spare Parts

Applicable Cutters				Bolt
TSXR 08032RS3416Z02	TRDR08IP	BFTX0308IP	2,0	BX0845
TSXR 08040RS4016Z03				BX0850
TSXR 08050RS5422Z03				BX1060
TSXR 08050RS5422Z04				
TSXR 08063RS6027Z05				BX1265

Milling Cutters

● = Euro stock
❍ = Japan stock

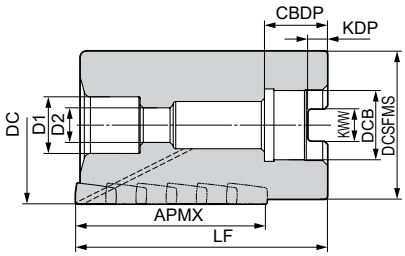
Recommended Tightening Torque (N·m)

TSXR 13000 RS

Rake Angle		
	Radial	-23°– -15°
	Axial	-6° – -3°

41-60 mm 90°

Shell Type



Body - TSXR

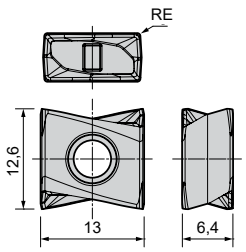
Cat. No.	Stock	Dimensions (mm)										No. of Teeth	Steps	Effective Teeth
		DC	APMX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2			
TSXR 13040RS4116Z02	❍	40	41	37	60	16,0	8,4	5,6	18,0	14	9	8	4	2
13050RS6022Z03	❍	50	60	47	80	22,0	10,4	6,3	20,0	18	11	18	6	3
13063RS5027Z03	❍	63	50	60	75	27,0	12,4	7,0	22,0	20	14	15	5	3
13063RS6027Z04	❍	63	60	60	80	27,0	12,4	7,0	22,0	20	14	24	6	4
13080RS6032Z04	❍	80	60	77	80	32,0	14,4	8,0	32,0	25	18	24	6	4
13080RS6032Z05	❍	80	60	77	80	32,0	14,4	8,0	32,0	25	18	30	6	5
13100RS6040Z05	❍	100	60	88	85	40,0	16,4	9,0	29,0	32	21	30	6	5
13100RS6040Z06	❍	100	60	88	85	40,0	16,4	9,0	29,0	32	21	36	6	6
13125RS6040Z07	❍	125	60	100	85	40,0	16,4	9,0	29,0	32	21	42	6	7

Inserts are not included.

Inserts

Dimensions (mm)

Application	Coated Carbide									
High Speed / Light Cutting	S M	P K M	P M			K	K		M S	
General Purpose Cutting	S M	P K M	P M	P M		K	K		M S	M S
Rough Cutting	S M			P M	P M			K		M S
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 130604 PNER-L	●			●	❍		❍	●	❍	●	0,4
130608 PNER-L	●			●	❍		❍	●	❍	●	0,8
130612 PNER-L	❍			●				●	●	●	1,2
130616 PNER-L	❍			❍				❍	❍	❍	1,6
130620 PNER-L	❍			❍				❍	❍	❍	2,0
130624 PNER-L	❍			❍				❍	❍	❍	2,4
130632 PNER-L	❍			❍				❍	❍	❍	3,2
LNEX 130604 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
130608 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
130612 PNER-G	❍		●	●	●		●	●	●	●	1,2
130616 PNER-G	●		❍	●	●		●	●	❍	●	1,6
130620 PNER-G	❍		❍	❍	❍		❍	❍	❍	❍	2,0
130624 PNER-G	●		❍	●	●		●	●	❍	●	2,4
130632 PNER-G	●		❍	●	●		●	●	❍	●	3,2
LNEX 130604 PNER-H	❍			❍	❍		❍	❍			0,4
130608 PNER-H	●	❍		●	●	❍	●	●			0,8
130612 PNER-H	❍			●	●		●	●			1,2
130616 PNER-H	●			●	●		●	●			1,6
130620 PNER-H	❍			❍	❍		❍	❍			2,0
130624 PNER-H	●			●	●		●	●			2,4
130632 PNER-H	●			●	●		●	●			3,2



Recommended Cutting Conditions

→ G38

Identification Details

TSXR	13	050	R	S	60	22	Z03
Cutter Series	Insert Size	Cutter Diameter	Direction	Metric Type	Max. Depth of Cut	Bore Diameter	Effective Teeth

Spare Parts

Applicable Cutters	Insert Wrench	Insert Screw		Bolt
TSXR 13040RS4116Z02	TRDR15IP	BFTX03510IP	3,0	BX0850
TSXR 13050RS6022Z03				BX1060
TSXR 13063RS5027Z03				BX1260
TSXR 13063RS6027Z04				BX1265
TSXR 13080RS6032Z04				BX1660
TSXR 13080RS6032Z05				
TSXR 13100RS6040Z05				BX2065
TSXR 13100RS6040Z06				
TSXR 13125RS6040Z07				

"Wave Mill" Series
WEZ Type

Expansion

General Features

- **Supports Various Machining Operations**
  A lineup of cutter sizes from Ø 14 to Ø 160 mm, which enable large ramping angles, 28 repeater type items are now available in addition to the modular type and short shank type.
- **Excellent Machining Quality**
  With a combination of optimised cutting edge shape and high-precision molding technology, superb wall surface accuracy and surface finish qualitiy are achieved.
- **Excellent Sharpness with Low Resistance**
  Reducing machining noise and suppressing burrs, the lineup includes ground type inserts with a focus on sharpness.
- **Applicable to Various Work Materials**
  In addition to the general-purpose grade ACU2500, the new generatioin coated carbide grades XCU2500/XCK2000 are available. Applicable to various work materials such as steel, stainless steel, cast iron, exotic alloys and more.

Product Range WEZ (Standard)

Type	Cat. No.	Diameter Range (mm) / No of Teeth																	
		Ø14	Ø16	Ø18	Ø20	Ø22	Ø25	Ø26	Ø28	Ø30	Ø32	Ø35	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160
Shell	WEZ 11000RS												4, 6	5,7	6, 8	7, 10	9, 12		
	WEZ 11000R (Inch)															7, 10	9, 12		
	WEZ 17000RS												3, 4	3, 5	4, 6	4, 7	5, 8	6, 9, 11	8, 10 12
	WEZ 17000R (Inch)															4, 7	5, 8	6, 9, 11	8, 10 12
Shank	WEZ 11000E	1	2*	2	2*, 3*	3	2, 3*, 4*		4	4	2, 3, 4, 5*	5	2, 4, 6	5, 7	8	10			
	WEZ 11000ES	1	2*		3*		4*												
	WEZ 11000EL	1	2*	2	2*	2	2*, 3		2	2	2*, 3	2, 3	2	3					
	WEZ 17000E	→ H30-41					2*		2	3	2, 3*	3	3, 4	3*, 5*	4*, 6*	7			
	WEZ 17000ES						2				3								
	WEZ 17000EL						2		2	2	2*, 3	2	2, 3, 4	3*, 5*	4*, 6*				
Modu-lar	WEZ 11000M		2	2	2, 3	3	2, 3, 4	4, 5	4, 5	2, 4, 5	2, 3, 4, 5	2, 5	2, 4, 5, 6						
	WEZ 17000M	→ H46-49					2, 3		2	2, 3	2, 3, 4	2, 3	2, 3, 4						

* Different shank diameters in stock

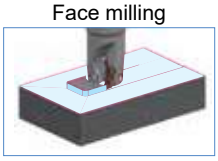
Product Range WEZR (Repeater)

Type	Cat. No.	Diameter Range (mm) / No of Teeth								
		Ø20	Ø25	Ø30	Ø32	Ø35	Ø40	Ø50	Ø63	Ø80
Shell	WEZR 11000RS						4	4		
	WEZR 17000RS							2, 3, 4	3, 4, 5	5
Shank	WEZR 11000E	1,2	2	2	2, 3	3	3, 4			
	WEZR 17000E	→ H42-45					2,3	2,3		
Modu-lar	WEZR 11000M				3					
	WEZR 17000M	→ H50-53					3			

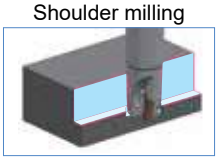
Suitable Applications

- Supports Ramping, Helical Milling, Plunge Cutting

Face milling

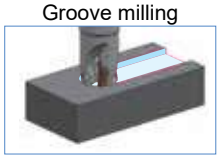


Shoulder milling

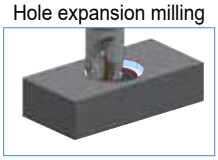


Side face milling

Groove milling

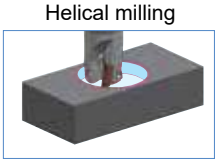


Hole expansion milling

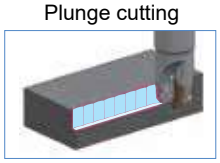


Ramping

Helical milling

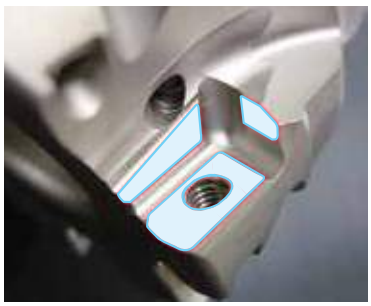


Plunge cutting



Optimised Body Design

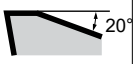
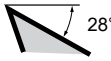
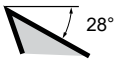
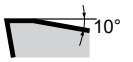
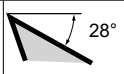
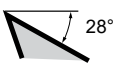
Wide guide face for stable insert clamping.

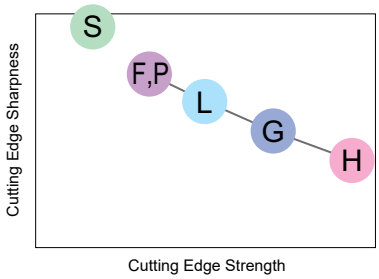


WEZ11 type

● = Euro stock

Chipbreaker Lineup

Work Material	P M K S H					N
Chipbreaker	L Type	G Type	H Type	F Type	P Type	S Type
AO_T11 Cutting edge geometry		28°	 20°	28°	 28°	 28°
AO_T17 Cutting edge geometry	28°	20°	 10°	 28°	28°	 28°
Applications	Light cut, low rigidity machining	Main breaker for general purpose to interrupted machining	Heavy cut, heavy interrupted machining, hardened steel	Light cut, finishing, low-burr design	Light cut, high-precision machining, high surface wall quality	For non-ferrous metals



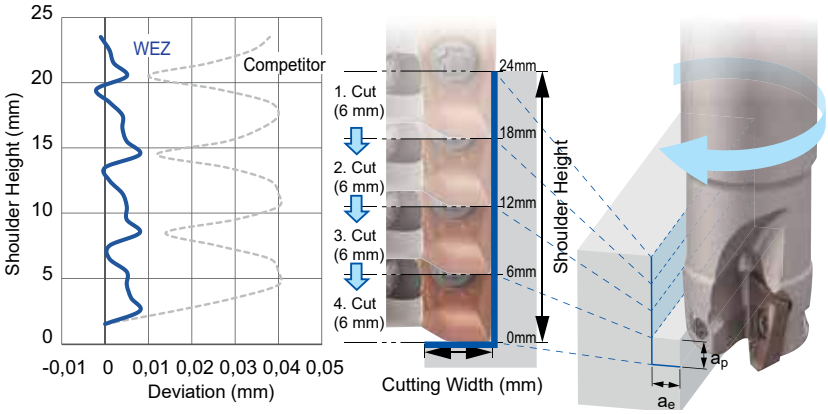
Product Range Inserts

Main Grade: ACU2500; S-Type: H20, DL2000

Cat. No.	Nose Radius (mm)													
	R0,2	R0,4	R0,5	R0,8	R1,0	R1,2	R1,6	R2,0	R2,4	R3,0	R3,2	R4,0	R5,0	R6,4
AOMT 11T3_ _ PEER-G	●	●	●	●	●	●	●	●	●	●	●			
AOMT 11T3_ _ PEER-H		●		●		●	●							
AOET 11T3_ _ PEER-F	●	●	●	●	●	●	●	●	●	●	●			
AOET 11T3_ _ PEER-P16	●	●	●	●	●	●								
AOET 11T3_ _ PEER-P20	●	●	●	●	●	●								
AOET 11T3_ _ PEER-P25	●	●	●	●	●	●								
AOET 11T3_ _ PEFR-S	●	●	●	●	●	●	●	●	●	●	●			
AOMT 1705_ _ PEER-L	●	●		●		●	●							
AOMT 1705_ _ PEER-G	●	●	●	●	●	●	●	●	●	●	●	●	●	●
AOMT 1705_ _ PEER-H		●		●		●	●							
AOET 1705_ _ PEER-F	●	●	●	●	●	●	●	●	●	●	●	●	●	●
AOET 1705_ _ PEER-P25	●	●	●	●	●	●								
AOET 1705_ _ PEER-P32	●	●	●	●	●	●								
AOET 1705_ _ PEFR-S	●	●	●	●	●	●	●	●	●	●	●	●	●	●

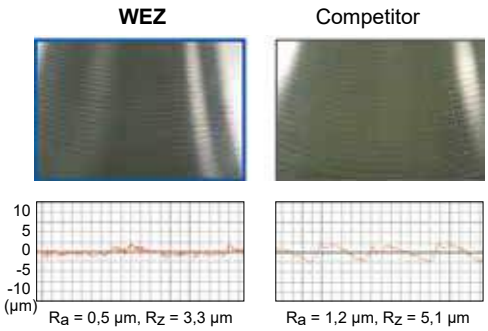
Improved Milling Quality

● Excellent Squareness

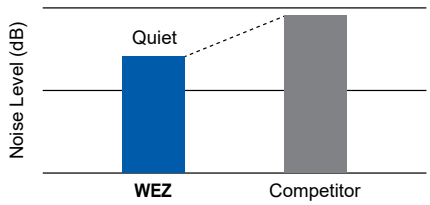


Machine:	Vertical Machining Centre BT40,
Work Material:	C50
Tool:	WEZ 11020 E03 (Ø 20, 3 teeth)
Insert:	AOMT11T308PEER-G (ACU2500)
Cutting Conditions:	v_c = 150 m/min, f_z = 0,15 mm/t, a_p = 6 mm x 4 passes, a_e = 5 mm, dry

● Excellent Surface Quality



● Lower cutting force helps reduce machining noise



Machine:	Vertical Machining Centre BT40,
Work Material:	C50
Tool:	WEZ 11020 E03 (Ø 20, 3 teeth)
Insert:	AOMT11T308PEER-G (ACU2500)
Cutting Conditions:	v_c = 150 m/min, f_z = 0,15 mm/t, a_p = 8 mm, a_e = 5 mm, dry

Features

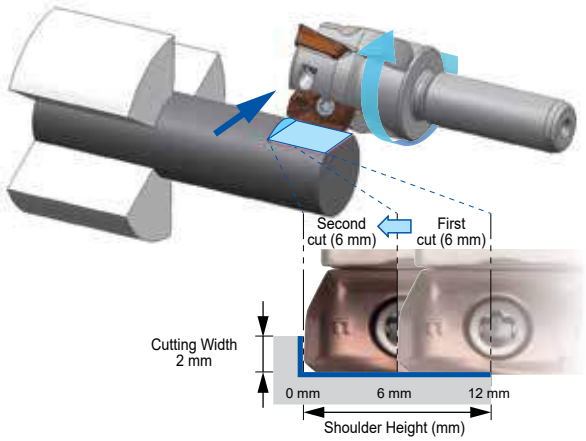
- **Developed for Multi-tasking Machines**
  Short shank type ideal for low-rigidity multi-tasking machines

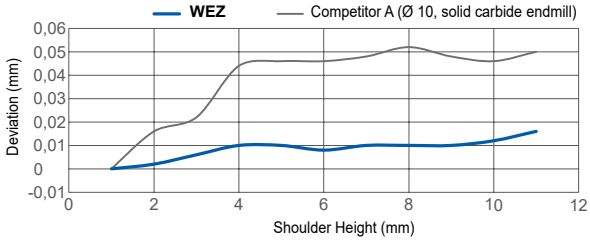
- **Superb Machining Quality**
  Shank design ideal for ER collets with face contact design that increases rigidity, realizing excellent shoulder accuracy and finished surface quality.

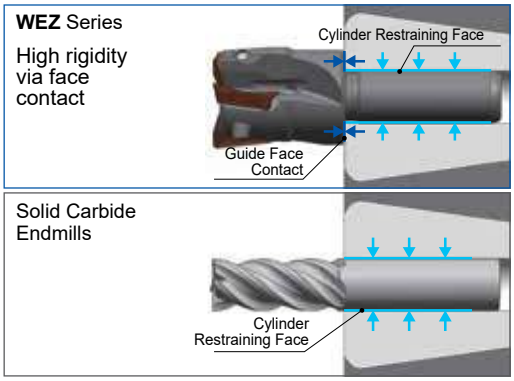
- **A Wide Selection of Inserts**
  Supports various machining applications with a wide selection of chipbreakers, with sharp cutting edges, different nose radi and dedicated grades for specific work materials.

Cutting Performance

Excellent Squareness

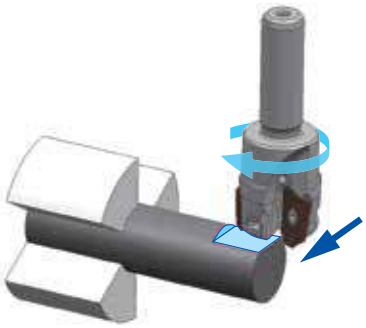




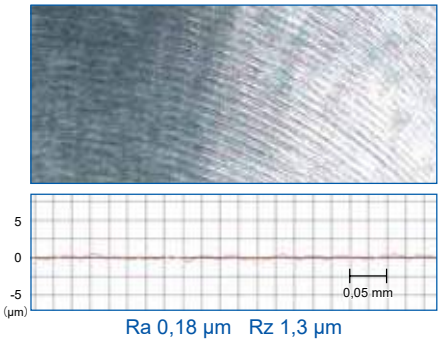


Machine:	Composite NC lathe
Work Matarial:	X5CrNiS1810, Ø 16 round bar
Tool:	WEZ11020ES03-10 (Ø 20, 3 flutes)
Insert:	AOET11T308PEER-F (ACU2500)
Cutting Data:	v_c = 100 m/min, f_z = 0,08 mm/t a_p = 6 mm x 2 passes, a_e = 2 mm, wet

Excellent Machined Surface Quality

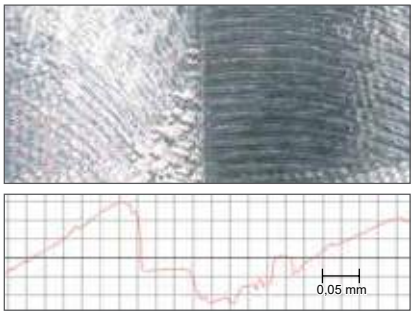


WEZ Series



Ra 0,18 µm Rz 1,3 µm

Competitor B (Ø 10, solid carbide endmill)



Ra 2,94 µm Rz 13,8 µm

Machine:	Composite NC lathe
Work Matarial:	X5CrNiS1810, Ø 16 round bar
Tool:	WEZ11020ES03-10 (Ø 20, 3 flutes)
Insert:	AOET11T308PEER-F (ACU2500)
Cutting Data:	**WEZ** type: v_c = 100 m/min, f_z = 0,05 mm/t, a_p = 2 mm, a_e = 12 mm, wet Competitor: v_c = 100 m/min, f_z = 0,05 mm/t, a_p = 2 mm, a_e = 6 mm x 2 passes, wet (solid carbide endmill)

Larger tool diameter than carbide solid endmills enables reduced number of passes for high-efficiency machining.

Good shoulder accuracy and machined surface quality, eliminating the finishing process.

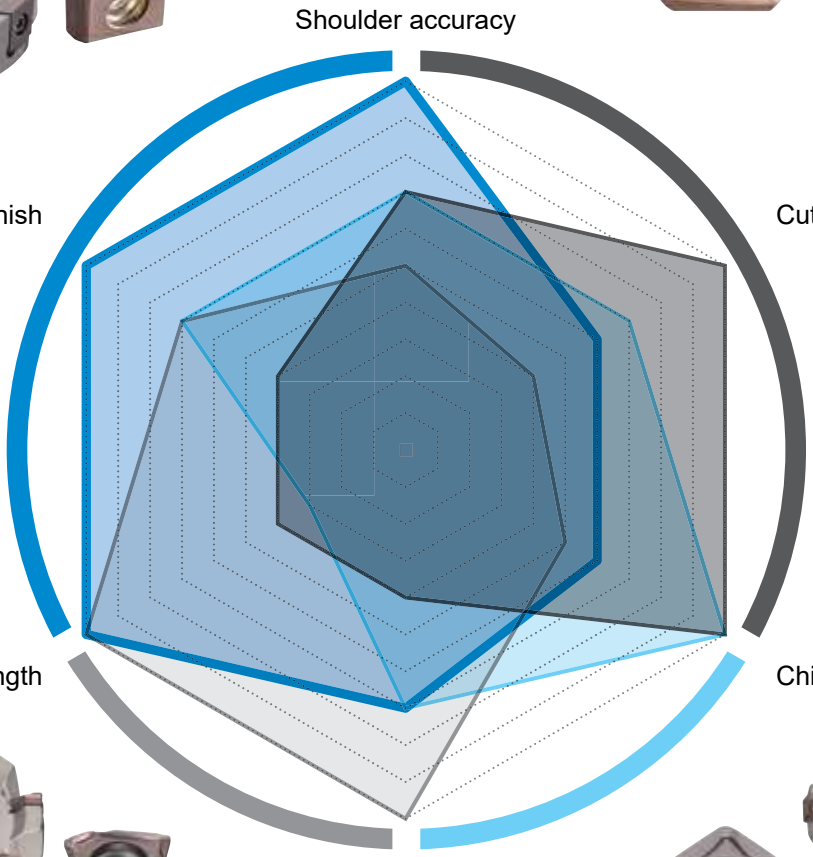
■ Shoulder Milling Tool Selection Guide

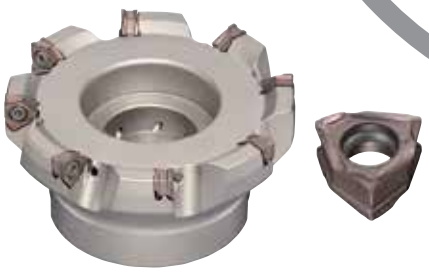
TSX Series – Accuracy

Ground insert

WEZ Series – Sharpness

High rake wave cutting edge





DFC Series – Economical

Six-cornered double side insert

WFX Series – General Purpose

Four-cornered single side insert

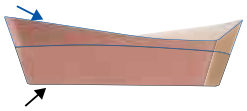
★★★ Top recommendation

	Surface Finish	Shoulder Accuracy	Cutting Force	Chip Control	Number of Corners	Cutting edge Strength
WEZ Series	★★★	★★★	★★★	★★★	★	★☆
TSX Series	★★★	★★★	★★	★☆	★★	★★★
DFC Series	★☆	★	★	★☆	★★★	★★★
WFX Series	★☆	★★	★★	★★★	★★	★★

■ High-precision Ground Class Insert with Excellent Sharpness

Ground Finish on Cutting Edge and Guide Face

The guide face has a ground finish as well as the cutting edge, minimizing corner difference when mounting on the body.
Stable runout precision and machining qualitiy.



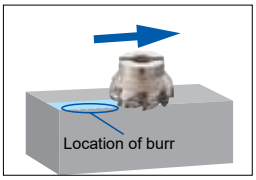
■ Lineup of Chipbreakers for Ground Inserts

F Type

Cutting edge specialized for sharpness and machining accuracy

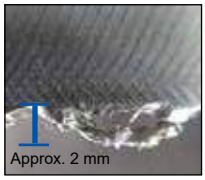
Sharpness from ground finish enables burr control.

Excellent squareness with all diameters.



WEZ

Competitor



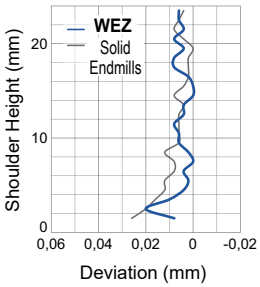
Machine:	Vertical Machining Centre BT50,
Work Material	X5CrNiS18 9
Tool:	WEZ 11050 RS07 (Ø 50, 7 teeth)
Insert:	AOET11T308PEER-F (ACU2500)
Cutting Conditions:	v_c = 120 m/min, f_z = 0,12 mm/t, a_p = 1 mm, a_e = 30 mm, dry

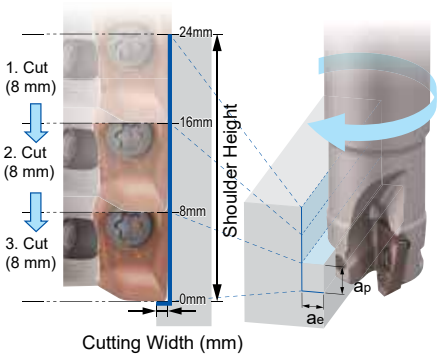
P Type

Chipbreaker for wall surface squareness equivalent to solid endmills

Premium item with cutting edge shape optimised for each cutter diameter while maintaining the F type chipbreaker's sharpness.

Enables wall surface squareness equal to solid endmills through a blade shape optimised for each tool diameter.





P Type Chipbreaker Selection

Cat. No.	Cutter Diameter (mm)										
	Ø14	Ø16	Ø18	Ø20	Ø22	Ø25	Ø28	Ø30	Ø32	Ø35	=> Ø40
AOET11T3_ _PEER-P_ _	-P16		-P20		–	-P25	–				
AOET1705_ _PEER-P_ _	–					-P25	-P32				–

Machine:	Vertical Machining Centre BT50,
Work Material:	C50
Tool:	WEZ 11020 E03 (Ø 20, 3 teeth)
Insert:	AOET11T308PEER-P20 (ACU2500)
Cutting Conditions:	v_c = 150 m/min, f_z = 0,1 mm/t, a_p = 8 mm x 3 passes, a_e = 1 mm, dry

S Type

Sharp edge chipbreaker for non-ferrous metals, with excellent adhesion resistance

Suppresses adhesion with rake face lapping.

DLC coat inserts available for further improved adhesion resistance.

WEZ

No Adhesion

Competitor A

Adhesion

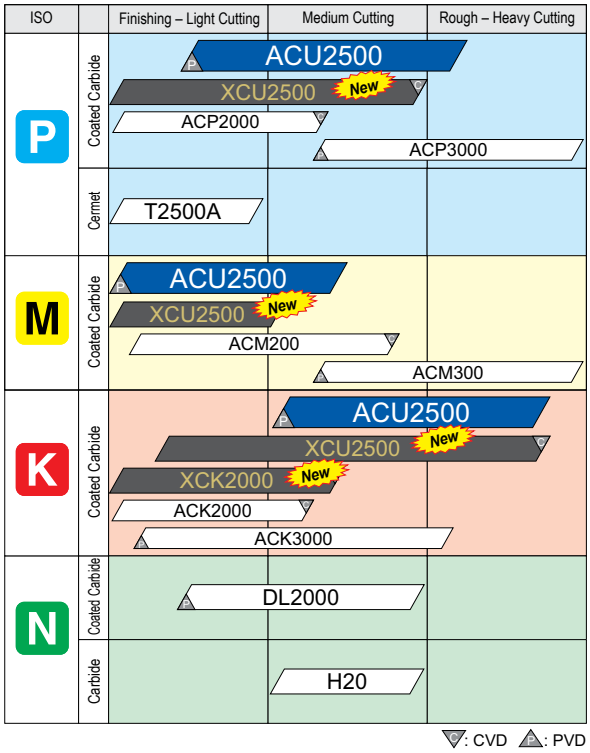
Competitor B

Adhesion

Machine:	Vertical Machining Centre BT50,
Work Material:	AlSi12Cu
Tool:	WEZ 11020 E03 (Ø 20, 3 teeth)
Insert:	AOET11T308PEER-S (H20)
Cutting Conditions:	v_c = 350 m/min, f_z = 0,1 mm/t, a_p = 3 mm, a_e = 10 mm, dry

Insert Grades Selection Guide

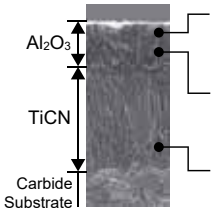
New generation coated carbide grades **XCU2500/ XCK2000** now available. Enhanced lineup of coatings in addition to cemented carbide and cermet for milling steel, stainless steel, cast iron and aluminum alloy.



Coating Features

New Absotech ™ (absolute technology) coating technology that realises absolute stability.

ABSOTECH — CVD



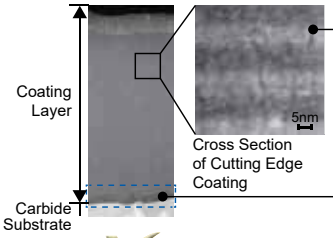
Special Surface Treatment
Suppresses thermal cracking by introducing high compressive stress, resulting in chipping resistance more than twice as good as conventional types

Crystal Orientation Control Al_2O_3
By controlling the growth direction, Al_2O_3 is reinforced for crater wear resistance more than twice as good as conventional types

High Hardness TiCN
Increased TiCN hardness by using a C-rich composition for flank wear resistance more than twice as good as conventional types.

Grades: ACP2000, ACK2000

ABSOTECH — PVD

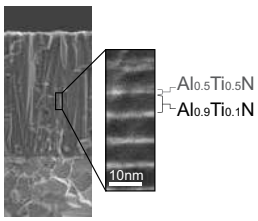


New Super Multi-Layered Composition
Higher hardness and twice the conventional wear resistance due to a fine crystal structure AlTiCrBN-based nano-layered coating.

High Adhesion Strength
Significantly improved coating adhesion. Chipping resistance more than twice as good as conventional types.

Grades: ACU2500, ACP3000, ACK3000

ABSOTECH X — CVD



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

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

Grades: XCU2500, XCK2000

Grade Characteristic Values

CVD

ISO	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (μm)	Features	Old Grade
P	ACP2000	89,5	3.2	ABSOTECH	10	· For high-speed machining of steel · Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal crack resistance	ACP100
P	New XCU2500	89,5	3,2	ABSOTECH X	6	· General-purpose grade for a wide variety of materials such as steel, cast iron and stainless steel · New coating combining wear and fracture resistance realises long tool life in medium-speed to high-speed machining	—
M	ACM200	89,8	3,4	Super FF Coat	6	· For machining high-hardness stainless steel · Adopts newly developed high-strength cemented carbide substrate with excellent wear resistance and thermal resistance, realizing outstanding stability when machining hardened stainless steel	AC230
K	ACK2000	91,7	3,1	ABSOTECH	10	· For high-speed cast iron milling · Stable long tool life in high-speed machining is realised by adopting a tough carbide substrate and a new coating with excellent thermal resistance	ACK100 ACK200
K	New XCK2000	91,7	2,5	ABSOTECH X	6	· For high-speed cast iron milling · Along with a high-hardness carbide substrate, the new coating combining wear and fracture resistance realises superb long tool life in medium-speed to high-speed machining	—

PVD

ISO	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (μm)	Features	Old Grade
P	ACU2500	91,6	3,8	ABSOTECH	3	· General-purpose grade supporting steel, stainless steel, and cast iron machining · Adopts a carbide substrate with excellent fracture resistance and wear resistance, plus a new coating with excellent wear resistance and chipping resistance, realising stable long tool life with various work material grades	—
P	ACP3000	89,5	3,2	ABSOTECH	3	· Our 1st recommended grade for milling steel · Carbide substrate with excellent thermal crack resistance, plus a new coating with excellent wear resistance and chipping resistance, realises stable long tool life over a wide range of cutting conditions	ACP200 ACP300
M	ACM300	89,8	3,4	(New) Super ZX Coat	3	· Our 1st recommended grade for milling stainless steel · Adopts high-strength cemented carbide substrate and super multi-layered coating for next-level wear resistance and fracture resistance	—
K	ACK3000	91,7	3,1	ABSOTECH	3	· Our 1st recommended grade for milling cast iron · Adopts a high thermal conductivity carbide substrate and a new coating with excellent wear resistance and chipping resistance, realizing stable long tool life over a wide range of cast iron machining operations	ACK300
N	DL2000	91,6	3,8	AURORA Coat (DLC)	0,5	· Grade for milling non-ferrous metal, utilising DLC coat with a low coefficient of friction and excellent adhesion resistance	—

Cermet

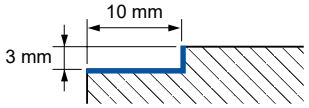
ISO	Grade	Hardness (HRA)	TRS (GPa)	Coating Type	Coating Thickness (μm)	Features	Old Grade
P M	T2500A	91,8	2,4	—	—	· For finishing of steel and stainless steel · Fine, uniform grain structure greatly improves toughness, realising long tool life and excellent surface finishes	T250A

Expansion

Recommended Cutting Conditions

WEZ11 Type

Cutter: WEZ 11020 E03
Insert: AO_T11T3 type
Cutting Data: a_p = 3 mm, a_e = 10 mm, dry



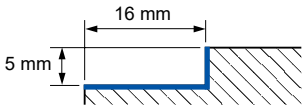
Min. - **Optimum** - Max.

ISO	Material	HB	Chipbreaker	Grade										
				ACU2500	XCU2500	ACP2000	ACP3000	T2500A	XCK2000	ACK2000	ACK3000	ACM200	ACM300	DL2000
				Feed Rate (mm/tooth)										
				0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,18	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,05–**0,10**–0,15
				Cutting Speed v_c (m/min)										
P	Unalloyed steel, <0, 15%C, annealed	125	G	270–**320**–370	300–**350**–400	300–**350**–400	250–**300**–350	230–**280**–330						
	· , <0, 45%C, annealed	190	G	170–**220**–270	200–**250**–300	200–**250**–300	150–**200**–250	130–**180**–230						
	· , <0, 45%C, tempered	250	G	140–**180**–220	160–**200**–245	160–**200**–245	120–**160**–200	105–**145**–185						
	· , <0, 75%C, annealed	270	G	110–**145**–175	130–**165**–195	130–**165**–195	100–**130**–165	85–**115**–150						
	· , <0, 75%C, tempered	300	G	70–**90**–110	80–**100**–120	80–**100**–120	60–**80**–100	50–**70**–90						
	Low alloyed steel, annealed	180	G	160–**205**–255	190–**235**–280	190–**235**–280	140–**190**–235	120–**170**–215						
	· , tempered	275	G	90–**120**–150	110–**135**–165	110–**135**–165	80–**110**–140	70–**100**–125						
	· , tempered	300	G	85–**110**–130	100–**125**–150	100–**125**–150	75–**100**–125	65–**90**–115						
	· , tempered	350	G	60–**80**–100	70–**90**–110	70–**90**–110	50–**70**–90	45–**65**–85						
	High alloyed and tool steel, annealed	200	G	140–**180**–220	160–**200**–245	160–**200**–245	120–**160**–205							
	· , tempered	325	G	55–**70**–85	60–**80**–100	60–**80**–100	50–**65**–80							
M	Stainless steel, ferritic/martensitic, annealed	200	G	110–**140**–170	160–**190**–210							140–**170**–190	90–**110**–140	
	· , martensitic, tempered	240	G	100–**125**–150	145–**170**–190							125–**150**–170	80–**100**–125	
	· , austenitic, plunged	180	G	120–**150**–180	170–**200**–220							150–**180**–200	100–**120**–150	
K	Grey cast iron		G	150–**200**–250	250–**300**–350				250–**300**–350	250–**300**–350	170–**220**–270			
	Nodular cast iron		G	90–**120**–150	150–**180**–210				150–**180**–210	150–**180**–210	100–**130**–160			
S	High tempered resist. alloys, Fe based, annealed		G	30–**40**–55								35–**45**–60	25–**35**–50	
	· , hardened		G	60–**80**–100								70–**90**–110	50–**70**–90	
N	Aluminium alloy, Si < 12,6%		S											500–**750**–100
	· , Si > 12,6%		S											170–**200**–250
	Copper alloy		S											300–**330**–350

The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine, work shape and clamping. They will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.
For groove milling, reduce the feed rate approximately 70 % of the corresponding value shown above.

WEZ17 Type

Cutter: WEZ 17032 E03
Insert: AO_T1705 type
Cutting Data: a_p = 5 mm, a_e = 16 mm, dry



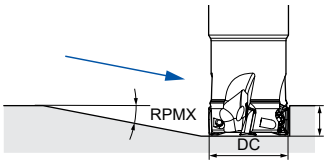
Min. - **Optimum** - Max.

ISO	Material	HB	Chipbreaker	Grade										
				ACU2500	XCU2500	ACP2000	ACP3000	T2500A	XCK2000	ACK2000	ACK3000	ACM200	ACM300	DL2000
				Feed Rate (mm/tooth)										
				0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,15**–0,22	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,05–**0,10**–0,15
				Cutting Speed v_c (m/min)										
P	Unalloyed steel, <0, 15%C, annealed	125	G	285–**335**–390	315–**360**–420	315–**360**–420	265–**315**–370	240–**295**–345						
	· , <0, 45%C, annealed	190	G	180–**230**–285	210–**265**–315	210–**265**–315	160–**210**–265	135–**190**–240						
	· , <0, 45%C, tempered	250	G	145–**190**–230	170–**210**–255	170–**210**–255	130–**170**–215	110–**155**–195						
	· , <0, 75%C, annealed	270	G	115–**150**–185	135–**170**–205	135–**170**–205	100–**135**–170	90–**125**–155						
	· , <0, 75%C, tempered	300	G	70–**90**–115	85–**105**–125	85–**105**–125	65–**85**–105	55–**75**–95						
	Low alloyed steel, annealed	180	G	170–**220**–265	200–**245**–295	200–**245**–295	150–**200**–250	130–**180**–225						
	· , tempered	275	G	100–**130**–155	115–**145**–175	115–**145**–175	85–**115**–145	75–**105**–135						
	· , tempered	300	G	90–**115**–140	105–**130**–155	105–**130**–155	75–**105**–130	65–**90**–120						
	· , tempered	350	G	65–**85**–100	75–**95**–115	75–**95**–115	55–**75**–95	50–**70**–85						
	High alloyed and tool steel, annealed	200	G	145–**185**–230	170–**215**–255	170–**215**–255	130–**170**–215							
	· , tempered	325	G	55–**75**–90	65–**85**–100	65–**85**–100	50–**65**–85							
M	Stainless steel, ferritic/martensitic, annealed	200	G	115–**145**–175	165–**195**–215							145–**175**–195	100–**115**–145	
	· , martensitic, tempered	240	G	105–**130**–155	150–**175**–195							130–**155**–175	85–**105**–130	
	· , austenitic, plunged	180	G	125–**155**–190	180–**210**–230							160–**190**–210	105–**125**–160	
K	Grey cast iron		G	160–**210**–265	265–**315**–370				265–**315**–370	265–**315**–370	180–**230**–285			
	Nodular cast iron		G	95–**125**–160	160–**190**–220				160–**190**–220	160–**190**–220	105–**140**–170			
S	High tempered resist. alloys, Fe based, annealed		G	30–**40**–60								35–**45**–60	25–**35**–50	
	· , hardened		G	60–**85**–105								75–**95**–115	50–**75**–95	
N	Aluminium alloy, Si < 12,6%		S											500–**750**–100
	· , Si > 12,6%		S											170–**200**–250
	Copper alloy		S											300–**330**–350

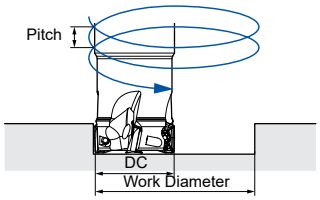
The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine, work shape and clamping. They will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.
For groove milling, reduce the feed rate approximately 70 % of the corresponding value shown above.

■ Ramping / Helical Milling Upper Limits

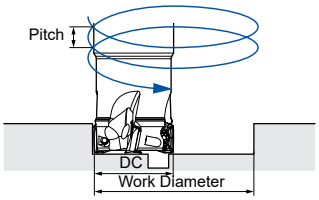
Ramping



Flat Bottom Machining



Machining with Prepared Hole



● WEZ11 Type

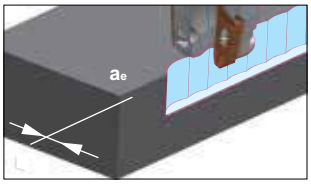
DC Ø (mm)	Max.Ramping Angle	Flat Bottom Machining				Machining with Prepared Hole	
	RPMX (°)	Max. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)
14	13,2	25,3	8,4	23,1	5,9	19,0	1,9
16	10,5	29,3	7,6	27,0	5,6	21,7	1,5
18	8,1	33,3	6,7	30,9	5,0	25,2	1,4
20	6,5	37,3	6,0	34,9	4,6	29,1	1,3
22	5,3	41,3	5,4	38,8	4,3	32,9	1,3
25	4,1	47,3	4,8	44,8	3,9	38,9	1,3
28	3,4	53,3	4,4	50,7	3,6	44,9	1,3
30	3,0	57,3	4,2	54,7	3,5	48,8	1,3
32	2,7	61,3	4,0	58,7	3,3	52,8	1,2
35	2,3	67,3	3,8	64,6	3,1	58,8	1,2
40	1,8	77,3	3,4	74,6	2,9	68,8	1,2
50	1,2	97,3	3,0	94,6	2,6	88,8	1,1
63	0,8	123,3	2,8	120,5	2,5	114,7	1,1

● WEZ17 Type

DC Ø (mm)	Max.Ramping Angle	Flat Bottom Machining				Machining with Prepared Hole	
	RPMX (°)	Max. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)
25	10,8	47,3	13,0	41,0	8,3	33,1	1,8
28	8,1	53,3	11,1	46,9	7,5	39,0	1,8
30	7,0	57,3	10,2	50,9	7,0	43,0	1,8
32	6,1	61,3	9,5	54,9	6,7	47,0	1,7
35	5,1	67,3	8,7	60,8	6,2	53,0	1,7
40	4,0	77,3	7,7	70,8	5,7	63,0	1,7
50	2,5	97,3	6,5	90,7	5,0	83,0	1,6
63	1,8	123,3	5,6	116,7	4,5	109,0	1,6

* The table above shows values with nose radius 0,8 mm

■ Plunge Cutting - Upper Limit for Radial Width a_e



Type	Max. a_e (mm)
WEZ11	3
WEZ17	5

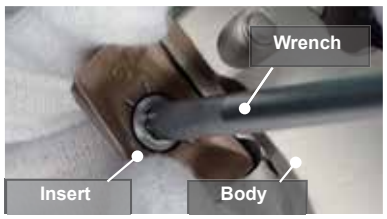
■ Precautions for Mounting

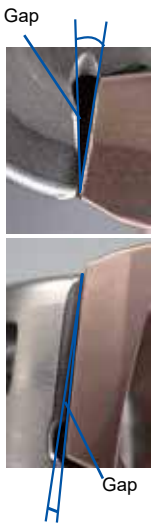
(1) Clean the mounting seat and contact parts.

(2) Apply screw lubrication to the screw thread as well as the screw head face to prevent seizure.

(3) While pressing the insert solidly against the seat surface, tighten at the screws with the included wrench.

(4) After tightening, check that there are no gaps between the surfaces.





WEZ 11000 R(S)

Rake Angle	Radial	-7° – -11°
	Axial	14° – 15°

10 mm 90°

Fig. 1

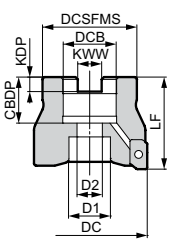


Fig. 2

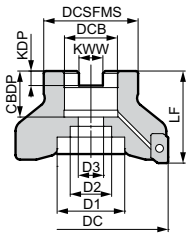
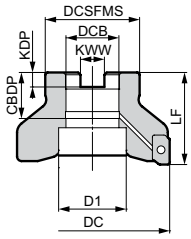


Fig. 3



Body - WEZ (Shell Type)

Dimensions (mm)

	Cat. No.	Stock	DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2	D3	No. of Teeth	Weight (kg)	Fig.
Metric	WEZ 11040RS04	●	40	33	40	16	8,4	5,6	18	14	9	–	4	0,21	1
	11040RS06	●	40	33	40	16	8,4	5,6	18	14	9	–	6	0,20	1
	11050RS05	●	50	41	40	22	10,4	6,3	20	18	11	–	5	0,32	1
	11050RS07	●	50	41	40	22	10,4	6,3	20	18	11	–	7	0,31	1
	11063RS06	●	63	50	40	22	10,4	6,3	20	18	11	–	6	0,58	1
	11063RS08	●	63	50	40	22	10,4	6,3	20	18	11	–	8	0,57	1
	11080RS07	●	*80	55	50	27	12,4	7,0	22	20	14	–	7	1,08	1
	11080RS10	●	*80	55	50	27	12,4	7,0	22	20	14	–	10	1,07	1
	11100RS09	●	100	70	50	32	14,4	8,0	32	46	–	–	9	1,57	3
	11100RS12	●	100	70	50	32	14,4	8,0	32	46	–	–	12	1,56	3
Inch	WEZ 11080R07	❍	*80	55	50	25,4	9,5	6,0	25	20	14	–	7	1,09	1
	11080R10	❍	*80	55	50	25,4	9,5	6,0	25	20	14	–	10	1,08	1
	11100R09	❍	*100	70	63	31,75	12,7	8,0	32	46	27	18	9	2,12	2
	11100R12	❍	*100	70	63	31,75	12,7	8,0	32	46	27	18	12	2,10	2

Inserts are sold separately. Check the arbor mounting size (DCB) when selecting the cutter.

* For securing the Ø 80 mm and Ø 100 mm cutter to the arbors, use JIS B1176 hexagonal bolt.
(Ø 80 mm: M12x30 to 35 mm, Ø 100 mm: M16x40x45 mm)

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZ 11040RS04	BFTX0306IP	1,5	TRDR08IP
11040RS06			
11050RS05			
11050RS07			
11063RS06			
11063RS08			
11080R(S)07			
11080R(S)10			
11100R(S)09			
11100R(S)12			

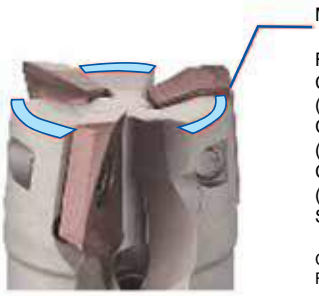
Recommended Cutting Conditions

→ G46

Identification Details

WEZ	11	050	R	S	07
Cutter Series	Insert Size	Cutter Diameter	Feed Direction	Metric	Number of Teeth

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.



Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT11T324PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT11T330PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT11T332PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
❍ = Japan stock
❑ = On request
⊟ = Not available
N·m Recommended Tightening Torque (N·m)

■ Inserts

Precautions for Mounting → G47

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	K P M S	P K M		P	K		K	M S	M S	N	N			
Roughing	K P M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 11T302PEER-G	●		❑	●		❑	●	●	●	–	–	●	0,2	1
11T304PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
11T305PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
11T308PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
11T310PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
11T312PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
11T316PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
11T320PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
11T324PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
11T330PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	2
11T332PEER-G	●		❑	❑		❑	❑	●	●	–	–		3,2	2
AOMT 11T304PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
11T308PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
11T312PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
11T316PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,6	1
AOET 11T302PEER-F	●		–			–		–		–	–	–	0,2	1
11T304PEER-F	●		–			–		–		–	–	–	0,4	1
11T305PEER-F	●		–			–		–		–	–	–	0,5	1
11T308PEER-F	●		–			–		–		–	–	–	0,8	1
11T310PEER-F	●		–			–		–		–	–	–	1,0	1
11T312PEER-F	●		–			–		–		–	–	–	1,2	1
11T316PEER-F	●		–			–		–		–	–	–	1,6	1
11T320PEER-F	●		–			–		–		–	–	–	2,0	1
11T324PEER-F	●		–			–		–		–	–	–	2,4	1
11T330PEER-F	●		–			–		–		–	–	–	3,0	2
11T332PEER-F	●		–			–		–		–	–	–	3,2	2
AOET 11T302PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
11T304PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
11T305PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
11T308PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
11T310PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
11T312PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
11T316PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
11T320PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
11T324PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
11T330PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	2
11T332PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	2

Fig. 1

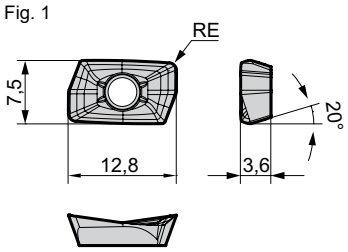
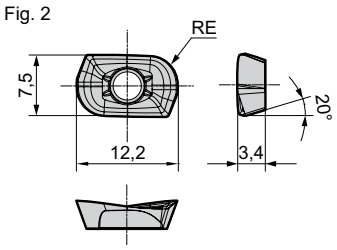


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

WEZ 17000 R(S)

Rake Angle	Radial	-4° – -9°
	Axial	10° – 15°

15 mm 90°

Fig. 1

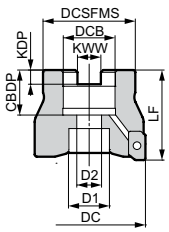


Fig. 2

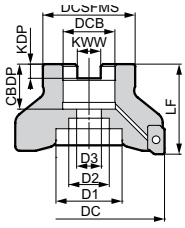


Fig. 3

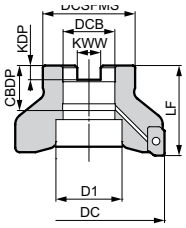


Fig. 4

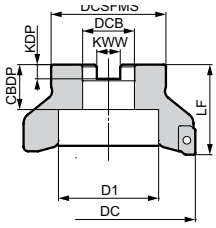
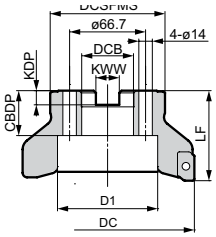


Fig. 5



Body - WEZ (Shell Type)

Dimensions (mm)

	Cat. No.	Stock	DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2	D3	No. of Teeth	Weight (kg)	Fig.
Metric	WEZ 17040RS03	●	40	33	40	16	8,4	5,6	18	14	9	–	3	0,19	1
	17040RS04	●	40	33	40	16	8,4	5,6	18	14	9	–	4	0,16	1
	17050RS03	●	50	41	40	22	10,4	6,3	20	18	11	–	3	0,30	1
	17050RS05	●	50	41	40	22	10,4	6,3	20	18	11	–	5	0,26	1
	17063RS04	●	63	50	40	22	10,4	6,3	20	18	11	–	4	0,54	1
	17063RS06	●	63	50	40	22	10,4	6,3	20	18	11	–	6	0,51	1
	17080RS04	●	*80	55	50	27	12,4	7,0	22	20	14	–	4	1,10	1
	17080RS07	●	*80	55	50	27	12,4	7,0	22	20	14	–	7	1,05	1
	17100RS05	●	100	70	50	32	14,4	8,0	32	46	–	–	5	1,58	3
	17100RS08	●	100	70	50	32	14,4	8,0	32	46	–	–	8	1,57	3
	17125RS06	●	125	80	63	40	16,4	9,0	29	52	29	–	6	3,04	1
	17125RS09	●	125	80	63	40	16,4	9,0	29	52	29	–	9	3,07	1
	17125RS11	●	125	80	63	40	16,4	9,0	29	52	29	–	11	3,02	1
	17160RS08	●	160	130	63	40	16,4	9,0	29	90	–	–	8	5,24	5
	17160RS10	●	160	130	63	40	16,4	9,0	29	90	–	–	10	5,31	5
	17160RS12	●	160	130	63	40	16,4	9,0	29	90	–	–	12	5,26	5
Inch	WEZ 17080R04	❍	*80	55	50	25,4	9,5	6,0	25	20	14	–	4	1,10	1
	17080R07	❍	*80	55	50	25,4	9,5	6,0	25	20	14	–	7	1,06	1
	17100R05	❍	*100	70	63	31,75	12,7	8,0	32	46	27	18	5	2,08	2
	17100R08	❍	*100	70	63	31,75	12,7	8,0	32	46	27	18	8	2,07	2
	17125R06	❍	125	80	63	38,1	15,9	10,0	35,5	55	30	–	6	3,09	1
	17125R09	❍	125	80	63	38,1	15,9	10,0	35,5	55	30	–	9	3,11	1
	17125R11	❍	125	80	63	38,1	15,9	10,0	35,5	55	30	–	11	3,06	1
	17160R08	❍	160	100	63	50,8	19,1	11,0	38	72	–	–	8	5,04	4
	17160R10	❍	160	100	63	50,8	19,1	11,0	38	72	–	–	10	5,09	4
	17160R12	❍	160	100	63	50,8	19,1	11,0	38	72	–	–	12	5,04	4

Inserts are sold separately. Check the arbor mounting size (DCB) when selecting the cutter.

* For securing the Ø 80 mm and Ø 100 mm cutter to the arbors, use JIS B1176 hexagonal bolt. (Ø 80 mm: M12x30 to 35 mm, Ø 100 mm: M16x40x45 mm)

Spare Parts

Applicable Cutters	Insert Screw		Wrench	Handle Grip	Wrench Bit
		N·m			
WEZ 17040RS03	BFTX0409IP	3,0	–	HPS1015	TRB15IP
17040RS04					
17050RS03					
17050RS05					
17063RS04					
17063RS06					
17080R(S)04					
17080R(S)07					
17100R(S)05					
17100R(S)08					
17125R(S)06					
17125R(S)09					
17125R(S)11					
17160R(S)08			TRDR15IP	–	–
17160R(S)10					
17160R(S)12					

Recommended Cutting Conditions

→ G46

Identification Details

WEZ	17	100	R	S	05
Cutter Series	Insert Size	Cutter Diameter	Feed Direction	Metric	Number of Teeth

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT170524PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT170530PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT170532PEER)
Corner radius = 4,0 mm: C = 2 mm (AOMT170540PEER)
Corner radius = 5,0 mm: C = 5 mm (AOMT170550PEER)
Corner radius = 6,4 mm: C = 5 mm (AOMT170564PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
❍ = Japan stock
❑ = On request
▭ = Not available
N·m Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → G47

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K S M	P K M		P	K		K	M S	M S	N	N			
Roughing	P K S M			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 170502PEER-L	●		–	❑		–	❑	●	●	–	–	❑	0,2	1
170504PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,4	1
170508PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,8	1
170512PEER-L	●		–	❑		–	❑	●	●	–	–		1,2	1
170516PEER-L	●		–	❑		–	❑	●	●	–	–		1,6	1
AOMT 170502PEER-G	●		❑	●		❑	●	●	●	–	–	❑	0,2	1
170504PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
170505PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
170508PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
170510PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
170512PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
170516PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
170520PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
170524PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
170530PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	1
170532PEER-G	●		❑	❑		❑	●	●	●	–	–		3,2	1
170540PEER-G	●		❑	●		❑	●	●	●	–	–		4,0	1
170550PEER-G	●		❑	●		❑	●	●	●	–	–		5,0	2
170564PEER-G	●		❑	❑		❑	❑	●	●	–	–		6,4	2
AOMT 170504PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
170508PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
170512PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
170516PEER-H	●		❑	●		❑	❑	●	●	–	–	–	1,6	1
AOET 170502PEER-F	●		–			–		–		–	–	–	0,2	1
170504PEER-F	●		–			–		–		–	–	–	0,4	1
170505PEER-F	●		–			–		–		–	–	–	0,5	1
170508PEER-F	●		–			–		–		–	–	–	0,8	1
170510PEER-F	●		–			–		–		–	–	–	1,0	1
170512PEER-F	●		–			–		–		–	–	–	1,2	1
170516PEER-F	●		–			–		–		–	–	–	1,6	1
170520PEER-F	●		–			–		–		–	–	–	2,0	1
170524PEER-F	●		–			–		–		–	–	–	2,4	1
170530PEER-F	●		–			–		–		–	–	–	3,0	1
170532PEER-F	●		–			–		–		–	–	–	3,2	1
170540PEER-F	●		–			–		–		–	–	–	4,0	1
170550PEER-F	●		–			–		–		–	–	–	5,0	2
170564PEER-F	●		–			–		–		–	–	–	6,4	2
AOET 170502PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
170504PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
170505PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
170508PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
170510PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
170512PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
170516PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
170520PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
170524PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
170530PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	1
170532PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	1
170540PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	4,0	1
170550PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	5,0	2
170564PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	6,4	2

Fig. 1

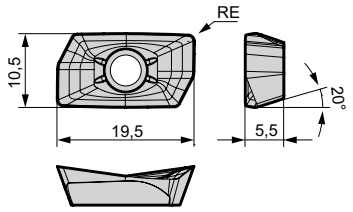
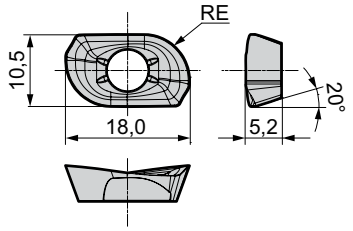


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

Features

- **High-efficiency Shoulder Milling**
  Inserts for "WaveMill" WEZ type are arranged in multiple stages forming a long cutting edge, to enable high-efficiency shoulder milling of deep steps.

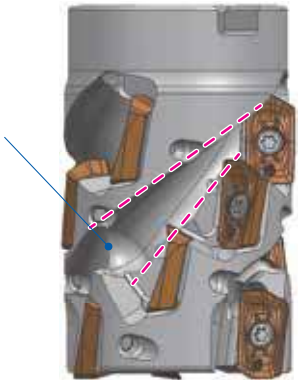
- **Very Low Vibration Tendency**
  Sharp milling inserts and irregular pitched body help to reduce chatter marks caused by vibration.

- **Support for all Types of Work Materials**
  A lineup of grades specific to each work materials, as well as the general-purpose ACU2500 grade, which is applicable to steel, stainless steel and cast iron.

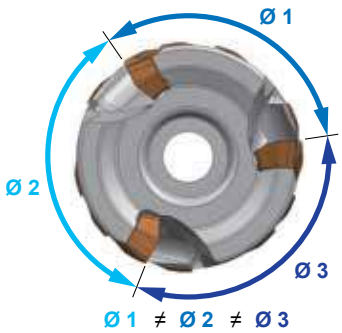
Body Features

- Improved Flute Shape

Optimised, upward tapering chip pocket geometry for improved chip removal and increased rigidity of the cutter body.



- Irregular Pitched Body



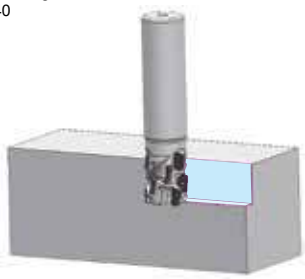
Irregular pitched body reduces vibration tendency

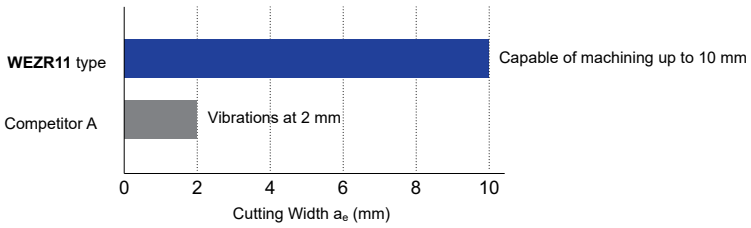
Cutting Performance

- Significantly less vibrations are a result of the combination of sharp inserts and irregular tooth pitch.

Capable of stable machining even with BT40 spindle machines

Vertical Machining Centre BT40

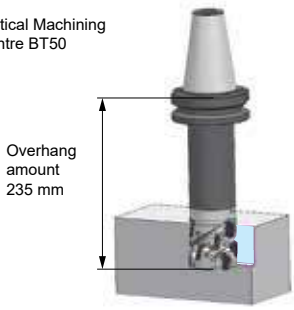


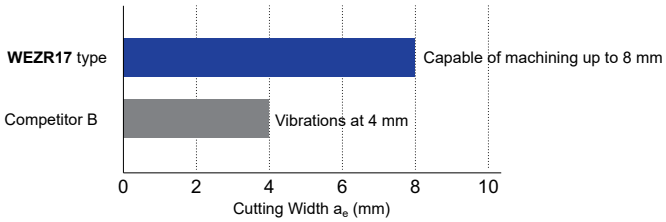


Machine:	Vertical Machining Centre BT40,
Work Material:	C55, overhang amount 60 mm
Tool:	WEZR 11032E3632Z03 (Ø 32, 3 teeth, 4-stage)
Insert:	AOET11T308PEER-G (ACU2500)
Cutting Conditions:	v_c = 150 m/min, f_z = 0,1 mm/t, a_p = 30 mm, dry

Capable of stable machining even with a long overhang

Vertical Machining Centre BT50

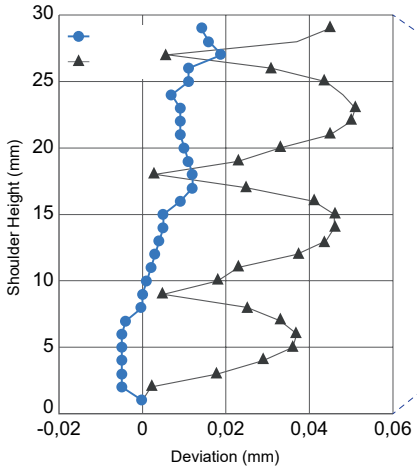


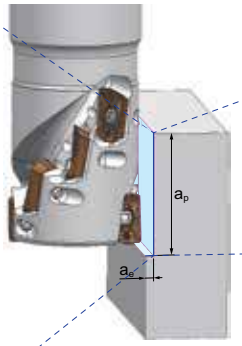


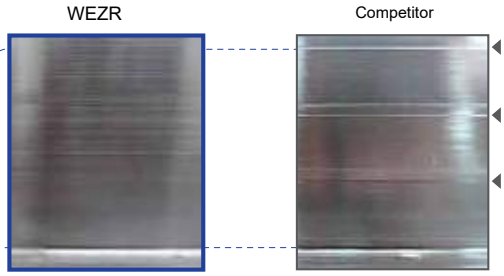
Machine:	Vertical Machining Centre BT50,
Work Material:	42CrMo4
Tool:	WEZR 17063RS5727Z04 (Ø 63, 4 teeth, 4-stage)
Insert:	AOET170508PEER-G (ACU2500)
Cutting Conditions:	v_c = 150 m/min, f_z = 0,15 mm/t, a_p = 50 mm, dry

Cutting Performance

- Optimised cutting edge shape and high-precision molding technology result in excellent shoulder accuracy.



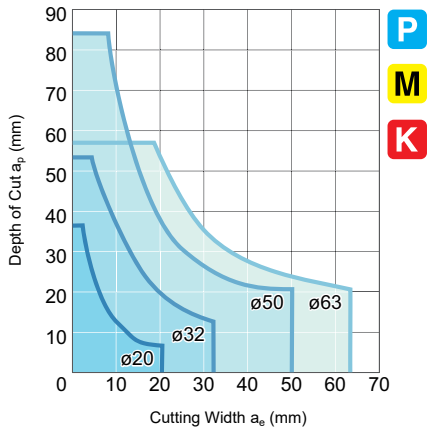


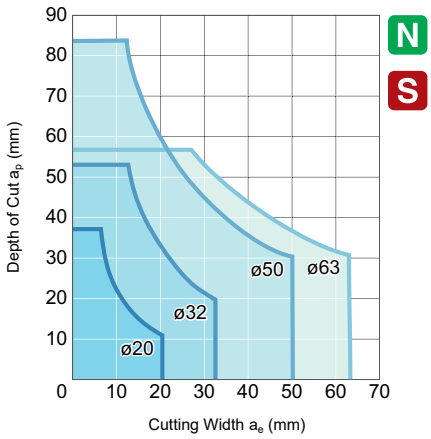


Machine:	Vertical Machining Centre BT50,
Work Material:	C55, overhang amount 60 mm
Tool:	WEZR 11032E3632Z02 (Ø 32, 2 teeth, 4-stage)
Insert:	AOET11T308PEER-G (ACU2500)
Cutting Conditions:	v_c = 160 m/min, f_z = 0,15 mm/t, a_p = 30 mm, a_p = 30 mm, dry

Application Range

- Steel, stainless steel, cast iron
- Aluminum alloys, titanium alloys





Note:
The depth of cut figures above are guidelines for use with BT50 machine tools. Use a depth of cut of approximately 50% if using BT40.
For a tool overhang of L/D = 3 or L/D = 4, use a depth of cut of approximately 50% or 25%, respectively.
There may be cases where machining cannot be performed at the depth of cut figures above, depending on the machine rigidity and work rigidity.
Cutting speed and feed rate data you will find on the next pages,

WEZR 11000 RS

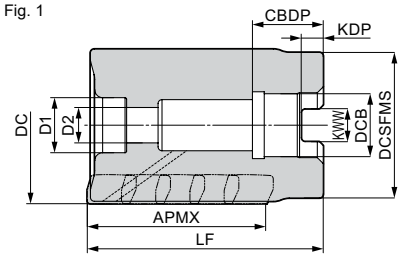
New

Repeater

Rake Angle	Radial	-11° – -9°
	Axial	14° – 15°

44–53 mm 90°

Fig. 1



Body (Shell Type)

Dimensions (mm)

	Cat. No.	Stock	DC	APMX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2	Total No. of Teeth	Steps	Effective No. of Teeth	Weight (kg)	Fig.
Metric	WEZR 11040RS4416Z04	❍	40	44	37	60	16	8,4	5,6	18	14	9	20	5	4	0,27	1
	11050RS5322Z04	❍	50	53	47	70	22	10,4	6,3	20	18	11	24	6	4	0,57	1

Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold seperately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench	Bolt
		N·m		
WEZR 11040RS4416Z04	BFTX0306IP	1,5	TRDR08IP	BX0850
11050RS5322Z04				BX1060

Identification Details

WEZR	11	040	R	S	44	16	Z04
Cutter Series	Insert Size	Cutter Diameter	Feed Direction	Metric	Max. Depth of Cut	Mounting Hole Diameter	Number of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Chipbreaker	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grades
P	Carbon Steel	≤ 280HB	G	100–**150**–200	0,08–**0,12**–0,20	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80–**100**–120	0,08–**0,12**–0,20	
	Alloy Steel	≤ 280HB	G	100–**150**–80	0,08–**0,12**–0,20	
M	Stainless Steel	≤ 280HB	G	80–**120**–160	0,08–**0,12**–0,20	ACU2500 ACM200 ACM300
K	Cast Iron Ductile Cast Iron	–	G	100–**150**–200	0,08–**0,12**–0,20	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	–	G	40–**50**–60	0,08–**0,12**–0,20	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12,6%	S	300–**500**–800	0,05–**0,10**–0,15	DL2000 H20
		Si >12,6%	S	100–**200**–250	0,05–**0,10**–0,15	

Min. - **Optimum** - Max.

Note:
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT11T324PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT11T330PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT11T332PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
❍ = Japan stock
❑ = On request
▭ = Not available
N·m Recommended Tightening Torque (N·m)

■ Inserts

Precautions for Mounting → G47

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	K P S M	P K M		P	K		K	M S	M S	N	N			
Roughing	K P S M			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 11T302PEER-G	●		❑	●		❑	●	●	●	–	–	●	0,2	1
11T304PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
11T305PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
11T308PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
11T310PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
11T312PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
11T316PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
11T320PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
11T324PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
11T330PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	2
11T332PEER-G	●		❑	❑		❑	❑	●	●	–	–		3,2	2
AOMT 11T304PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
11T308PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
11T312PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
11T316PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,6	1
AOET 11T302PEER-F	●		–			–		–		–	–	–	0,2	1
11T304PEER-F	●		–			–		–		–	–	–	0,4	1
11T305PEER-F	●		–			–		–		–	–	–	0,5	1
11T308PEER-F	●		–			–		–		–	–	–	0,8	1
11T310PEER-F	●		–			–		–		–	–	–	1,0	1
11T312PEER-F	●		–			–		–		–	–	–	1,2	1
11T316PEER-F	●		–			–		–		–	–	–	1,6	1
11T320PEER-F	●		–			–		–		–	–	–	2,0	1
11T324PEER-F	●		–			–		–		–	–	–	2,4	1
11T330PEER-F	●		–			–		–		–	–	–	3,0	2
11T332PEER-F	●		–			–		–		–	–	–	3,2	2
AOET 11T302PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
11T304PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
11T305PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
11T308PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
11T310PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
11T312PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
11T316PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
11T320PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
11T324PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
11T330PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	2
11T332PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	2

Fig. 1

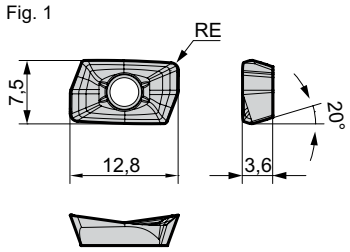
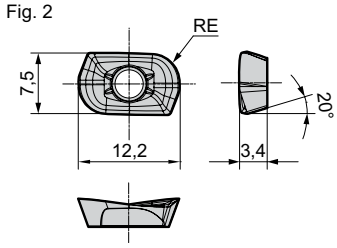


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

WEZR 17000 RS

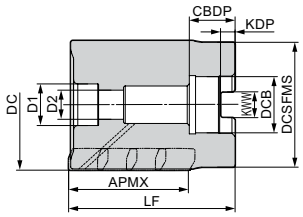
New

Repeater

Rake Angle	Radial	-8° – -6
	Axial	7° – 15°

29–57 mm 90°

Fig. 1



Body (Shell Type)

Dimensions (mm)

	Cat. No.	Stock	DC	APMX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2	Total No. of Teeth	Steps	Effective No. of Teeth	Weight (kg)	Fig.
Metric	WEZR 17050RS2922Z04	❍	40	29	47	50	22	10,4	6,3	20	18	11	8	2	4	0,35	1
	17050RS5722Z02	❍	50	57	47	80	22	10,4	6,3	20	18	11	8	4	2	0,70	1
	17050RS5722Z03	❍	50	57	47	80	22	10,4	6,3	20	18	11	12	4	3	0,59	1
	17063RS2927Z05	❍	63	29	60	55	27	12,4	7	22	20	14	10	2	5	0,74	1
	17063RS5727Z03	❍	63	57	60	80	27	12,4	7	22	20	14	12	4	3	1,11	1
	17063RS5727Z04	❍	63	57	60	80	27	12,4	7	22	20	14	16	4	4	1,05	1
	17080RS5627Z05	❍	80	56	70	80	27	12,4	7	22	20	14	20	4	5	1,85	1
	17080RS5632Z05	❍	80	56	70	80	32	14,4	8	26	25	18	20	4	5	1,76	1

Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold seperately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench	Handle Grip	Wrench Bit	Bolt
WEZR 17050RS2922Z04	BFTX0409IP	3,0	–	HPS1015	TRB15IP	BX1045
17050RS5722Z02						BX1070
17050RS5722Z03						
17063RS2927Z05						BX1240
17063RS5727Z03						BX1265
17063RS5727Z04						
17080RS5627Z05			TRDR15IP	–	–	BX1265
17080RS5632Z05						BX1660

Identification Details

WEZR	17	050	R	S	29	22	Z04
Cutter Series	Insert Size	Cutter Diameter	Feed Direction	Metric	Max. Depth of Cut	Mounting Hole Diameter	Number of Teeth

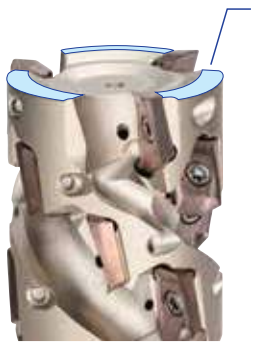
Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Chipbreaker	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grades
P	Carbon Steel	≤ 280HB	G	100–**150**–200	0,10–**0,20**–0,30	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80–**100**–120	0,10–**0,20**–0,30	
	Alloy Steel	≤ 280HB	G	100–**150**–80	0,10–**0,20**–0,30	
M	Stainless Steel	≤ 280HB	G	80–**120**–160	0,10–**0,20**–0,30	ACU2500 ACM200 ACM300
K	Cast Iron Ductile Cast Iron	–	G	100–**150**–200	0,10–**0,20**–0,30	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	–	G	40–**50**–60	0,10–**0,20**–0,30	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12,6%	S	300–**500**–800	0,05–**0,10**–0,15	DL2000 H20
		Si >12,6%	S	100–**200**–250	0,05–**0,10**–0,15	

Min. - **Optimum** - Max.

Note:
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.



Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT170524PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT170530PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT170532PEER)
Corner radius = 4,0 mm: C = 2 mm (AOMT170540PEER)
Corner radius = 5,0 mm: C = 5 mm (AOMT170550PEER)
Corner radius = 6,4 mm: C = 5 mm (AOMT170564PEER)
Standard: R = 1 mm
C: Chamfer
R: Radius

● = Euro stock ❍ = Japan stock ❑ = On request ⊟ = Not available (N·m) Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → G47

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	K P S M	P K M		P	K		K	M S	M S	N	N			
Roughing	K P S M			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 170502PEER-L	●		–	❑		–	❑	●	●	–	–	❑	0,2	1
170504PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,4	1
170508PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,8	1
170512PEER-L	●		–	❑		–	❑	●	●	–	–		1,2	1
170516PEER-L	●		–	❑		–	❑	●	●	–	–		1,6	1
AOMT 170502PEER-G	●		❑	●		❑	●	●	●	–	–	❑	0,2	1
170504PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
170505PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
170508PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
170510PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
170512PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
170516PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
170520PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
170524PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
170530PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	1
170532PEER-G	●		❑	❑		❑	●	●	●	–	–		3,2	1
170540PEER-G	●		❑	●		❑	●	●	●	–	–		4,0	1
170550PEER-G	●		❑	●		❑	●	●	●	–	–		5,0	2
170564PEER-G	●		❑	❑		❑	❑	●	●	–	–		6,4	2
AOMT 170504PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
170508PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
170512PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
170516PEER-H	●		❑	●		❑	❑	●	●	–	–	–	1,6	1
AOET 170502PEER-F	●		–			–		–		–	–	–	0,2	1
170504PEER-F	●		–			–		–		–	–	–	0,4	1
170505PEER-F	●		–			–		–		–	–	–	0,5	1
170508PEER-F	●		–			–		–		–	–	–	0,8	1
170510PEER-F	●		–			–		–		–	–	–	1,0	1
170512PEER-F	●		–			–		–		–	–	–	1,2	1
170516PEER-F	●		–			–		–		–	–	–	1,6	1
170520PEER-F	●		–			–		–		–	–	–	2,0	1
170524PEER-F	●		–			–		–		–	–	–	2,4	1
170530PEER-F	●		–			–		–		–	–	–	3,0	1
170532PEER-F	●		–			–		–		–	–	–	3,2	1
170540PEER-F	●		–			–		–		–	–	–	4,0	1
170550PEER-F	●		–			–		–		–	–	–	5,0	2
170564PEER-F	●		–			–		–		–	–	–	6,4	2
AOET 170502PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
170504PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
170505PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
170508PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
170510PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
170512PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
170516PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
170520PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
170524PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
170530PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	1
170532PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	1
170540PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	4,0	1
170550PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	5,0	2
170564PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	6,4	2

Fig. 1

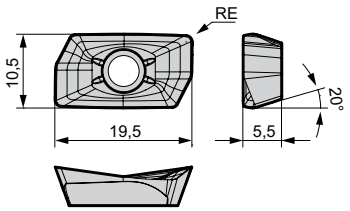
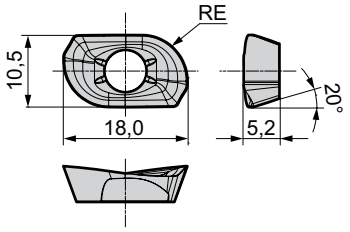


Fig. 2

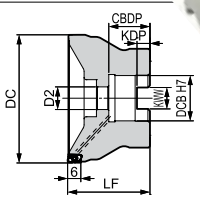


L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

”Wave Mill” Series
WEX (-F) Type

5 mm 90°

Fig. 1



10 mm 90°

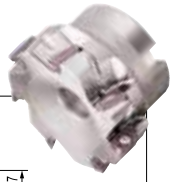
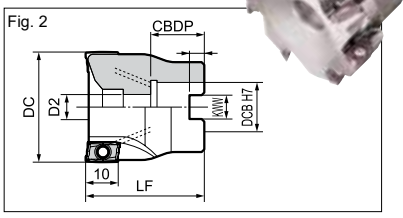


Fig. 2



14 mm 90°

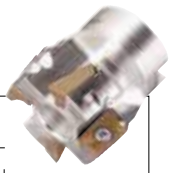
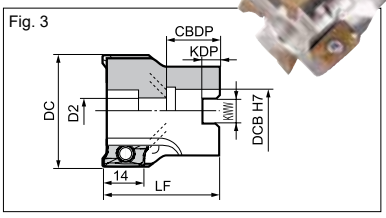


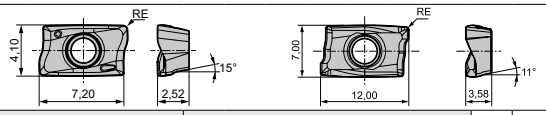
Fig. 3



■ Body (Shell Type ”F”)

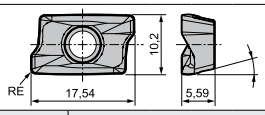
Cat. No.	Dimensions (mm)								No.of Teeth	Fig.
	Stock	DC	DCB	D2	KWW	KDP	LF	CBDP		
WEX 1032 F	▲	32	16	9	8,4	5,6	40	18	8	1
1040 F	▲	40	16	11	8,4	5,6	40	18	10	1
1050 F	▲	50	22	11	10,4	6,3	40	20	12	1
1063 F	▲	63	22	11	10,4	6,3	40	20	14	1
WEX 2040 F	▲	40	16	9	8,4	5,6	40	18	6	2
2050 F	▲	50	22	11	10,4	6,3	40	20	7	2
2063 F	▲	63	22	11	10,4	6,3	40	20	8	2
2080 F	▲	80	27	13,5	12,4	7,0	50	25	10	2
WEX 2100 F	❑	100	32	32	14,4	8,5	50	26	12	2
WEX 3040 F	▲	40	16	9	8,4	5,6	40	18	4	3
3050 F	▲	50	22	11	10,4	6,3	40	20	5	3
3063 F	▲	63	22	11	10,4	6,3	40	20	6	3
3080 F	▲	80	27	13,5	12,4	7,0	50	25	7	3
WEX 3100 F	▲	100	32	32	14,4	8,5	50	26	8	3

■ Inserts for WEX1000 / 2000 Type



Application	Coated Carbide							Carbide	DLC	
High Speed / Light cut	P			K		M S		K N	N	
General Purpose		P M	P M	K		M S	M S		N	
Roughing		P M	P M		K		M S			
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 060204 PDER-L	▲	▲	▲	▲	▲	▲	▲			0,4
060208 PDER-L	▲	▲	▲	▲	▲	▲	▲			0,8
060212 PDER-L		▲			❍	▲	▲			1,2
AXMT 060204 PDER-G	▲	▲	▲	❍	▲	▲	▲			0,4
060208 PDER-G	▲	▲	▲	▲	▲	▲	▲			0,8
060212 PDER-G	❍	▲	▲		▲	▲	▲			1,2
AXMT 060204 PDER-H	❍	▲	▲		▲	▲	▲			0,4
060208 PDER-H		▲	▲		▲	▲	▲			0,8
060212 PDER-H	❍	▲	▲		▲	▲	▲			1,2
AXMT 123504 PEER-G	▲	▲	▲	▲	▲			–	–	0,4
123508 PEER-G	▲	▲	▲	▲	▲			–	–	0,8
123512 PEER-G	▲	▲	▲	▲	▲			–	–	1,2
AXMT 123504 PEER-H	▲	▲	▲	▲	▲			–	–	0,4
123508 PEER-H	▲	▲	▲	▲	▲			–	–	0,8
123512 PEER-H	▲	▲	▲	▲	▲			–	–	1,2
AXMT 123504 PEER-E						▲	▲	–	–	0,4
123508 PEER-E						▲	▲	–	–	0,8
123512 PEER-E						▲	▲	–	–	1,2
AXMT 123508 PEER-EH						▲	▲	–	–	0,8
AXMT 060202 PDFR-S	–	–	–	–	–	–	–	❍	❍	0,2
AXET 123502 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,2
123504 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,4
123508 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,8

■ Inserts for WEX3000 Type



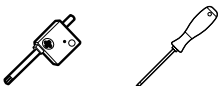
Application	Coated Carbide							Carbide	DLC	
High Speed / Light cut	P			K		M S		K N	N	
General Purpose		P M	P M	K		M S	M S		N	
Roughing		P M	P M		K		M S			
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 170508 PEER-L	▲	▲	▲	▲	▲			–	–	0,8
AXMT 170504 PEER-G	▲	▲	▲	▲	▲			–	–	0,4
170508 PEER-G	▲	▲	▲	▲	▲			–	–	0,8
170512 PEER-G	▲	▲	▲	▲	▲			–	–	1,2
170516 PEER-G	❍	▲	▲	▲	▲			–	–	1,6
170520 PEER-G*	▲	▲	▲	▲	▲			–	–	2,0
170530 PEER-G*	▲	▲	▲	▲	▲			–	–	3,0
AXMT 170508 PEER-H	▲	▲	▲	▲	▲			–	–	0,8
170512 PEER-H	▲	▲	▲	▲	▲			–	–	1,2
AXMT 170504 PEER-E						▲	▲	–	–	0,4
170508 PEER-E						▲	▲	–	–	0,8
170512 PEER-E						▲	▲	–	–	1,2
170516 PEER-E						▲	▲	–	–	1,6
170520 PEER-E*						▲	▲	–	–	2,0
170530 PEER-E*						▲	▲	–	–	3,0
AXMT 170508 PEER-EH			▲			▲	▲	–	–	0,8
AXET 170502 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,2
170504 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,4
170508 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,8

* Cutter body modification is required.

– Unable to produce

L – Low cutting force
G – General type
H – Strong cutting edge
E – For stainless steel
EH– Strong edge for stainless steel
S – For aluminium

■ Spare Parts

Screw	Wrench		Applicable Endmill
		N·m	
BFTX 01804 IP	TRX 06 IP	0,5	WEX 1000 F
BFTX 0306 IP	TRDR 08 IP	2,0	WEX 2000 F
BFTX 0409 IP	TRDR 15 IP	3,0	WEX 3000 F

■ Identification Details

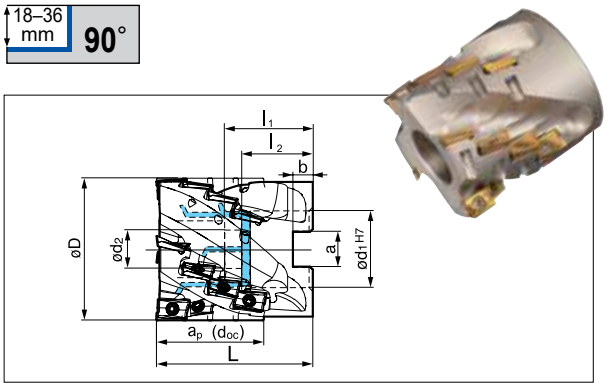
WEX	2	016	F
Cutter Series	2000 Series	Cutter Diameter	Shell Type

● = Euro stock
❍ = Japan stock
❑ = Delivery on request
▲ = To be replaced by new item

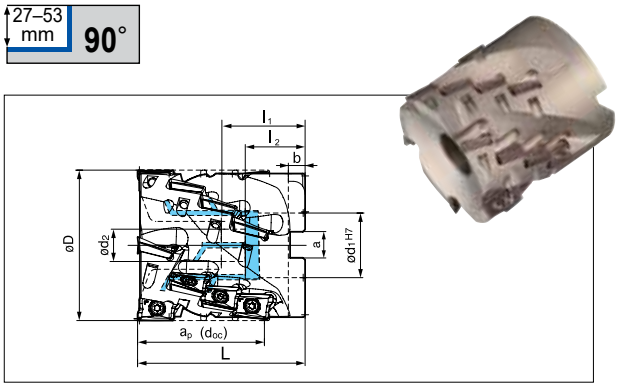
→ H56-60

N·m Recommended Tightening Torque (N·m)

18–36 mm 90°



27–53 mm 90°



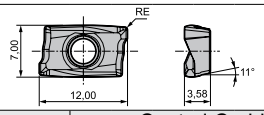
Body (Shell Type "F")

Cat. No.	Stock	Depth of cut (a_p)	Dimensions (mm) øD	ød1	ød2	a	b	l1	l	l	No. of teeth	No. of rows	Effective teeth
WRX2040RH18F16	❑	18	40	16	9	8,4	5,6	50	39	18	10	2	5
WRX2040RH36F16	●	36	40	16	9	8,4	5,6	55	44	18	16	4	4
WRX2050RH18F22	❑	18	50	22	11	10,4	6,3	50	36	20	10	2	5
WRX2050RH36F22	●	36	50	22	11	10,4	6,3	55	41,5	20	16	4	4

Body (Shell Type "F")

Cat. No.	Stock	Depth of Cut (a_p)	Dimensions (mm) øD	ød1	ød2	a	b	l1	l	l	No. of teeth	No. of rows	Effective teeth
WRX3050RH27F22	❑	27	50	22	11	10	6,3	50	36	20	8	2	4
WRX3050RH53F22	●	53	50	22	11	10	6,3	70	56	20	12	4	3
WRX3063RH27F27	❑	27	63	27	13,5	12	7	70	34	2	10	2	5
WRX3063RH53F27	●	53	63	27	13,5	12	7	70	54	2	16	4	4
WRX3080RH27F32	❑	27	80	32	17	14	8	50	30	2	12	2	6
WRX3080RH53F32	●	53	80	32	17	14	8	85	63	2	20	4	5
WRX3100RH27F40	❑	27	100	40	21	16	9,5	85	40	30	14	2	7
WRX3100RH53F40	●	53	100	40	21	16	9,5	85	59	30	24	4	6

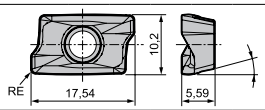
Inserts (Same as for Wavemill WEX 2000 Type)



Application	Coated Carbide							Carbide	DLC
High Speed / Light cut	P			K		M S		K N	N
General Purpose		P		K		M S	M S		N
Roughing		P	P		K		M S		
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 123504 PEER-G	▲	▲	▲	▲	▲			–	–	0,4
123508 PEER-G	▲	▲	▲	▲	▲			–	–	0,8
123512 PEER-G	▲	▲	▲	▲	▲			–	–	1,2
AXMT 123504 PEER-H	▲	▲	▲	▲	▲			–	–	0,4
123508 PEER-H	▲	▲	▲	▲	▲			–	–	0,8
123512 PEER-H	▲	▲	▲	▲	▲			–	–	1,2
AXMT 123504 PEER-E						▲	▲	–	–	0,4
123508 PEER-E						▲	▲	–	–	0,8
123512 PEER-E						▲	▲	–	–	1,2
AXMT 123508 PEER-EH						▲	▲	–	–	0,8
AXET 123502 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,2
123504 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,4
123508 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,8

– Unable to produce
L – Low cutting force
G – General type
H – Strong cutting edge
E – For stainless steel
EH– Strong edge for stainless steel
S – For aluminium

Inserts (Same as for Wavemill WEX 3000 Type)



Application	Coated Carbide							Carbide	DLC
High Speed / Light cut	P			K		M S		K N	N
General Purpose		P M	P M	K		M S	M S		N
Roughing		P M	P M		K		M S		
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 170508 PEER-L	▲	▲	▲	▲	▲			–	–	0,8
AXMT 170504 PEER-G	▲	▲	▲	▲	▲			–	–	0,4
170508 PEER-G	▲	▲	▲	▲	▲			–	–	0,8
170512 PEER-G	▲	▲	▲	▲	▲			–	–	1,2
170516 PEER-G	❍	▲	▲	▲	▲			–	–	1,6
170520 PEER-G*	▲	▲	▲	▲	▲			–	–	2,0
170530 PEER-G*	▲	▲	▲	▲	▲			–	–	3,0
AXMT 170508 PEER-H	▲	▲	▲	▲	▲			–	–	0,8
170512 PEER-H	▲	▲	▲	▲	▲			–	–	1,2
AXMT 170504 PEER-E						▲	▲	–	–	0,4
170508 PEER-E						▲	▲	–	–	0,8
170512 PEER-E						▲	▲	–	–	1,2
170516 PEER-E						▲	▲	–	–	1,6
170520 PEER-E*						▲	▲	–	–	2,0
170530 PEER-E*						▲	▲	–	–	3,0
AXMT 170508 PEER-EH			▲			▲	▲	–	–	0,8
AXET 170502 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,2
170504 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,4
170508 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,8

* Cutter body modification is required.

Spare Parts

Screw	Wrench	N·m	Applicable Endmill
BFTX 0306 IP	TRDR 08 IP	2,0	WRX 2_ _ _ _ RH_ _F_ _
BFTX 0409 IP	TRDR 15 IP	3,0	WRX 3_ _ _ _ RH_ _F_ _

Identification Details

WRX 20 40 R H 18 F 16

- 20: Insert Size
- 40: Tool øD
- R: Cutting Direction
- H: Inner coolant
- 18: Cutting Edge Length
- F: Arbor Type
  - **E** - Straight Shank
  - **W** - Weldon Shank
  - **F** - Shell Type
- 16: Arbor Diameter

→ H64-67

MTIX 16000 Type

New

General Features

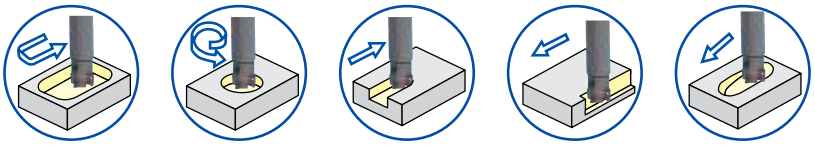
Stable and Reliabel Tool Life in Titanium Roughing

With combination of high toughness grade ACM300 and optimized cutting edge shape, stable and reliable tool life are achieved in roughing application of Titanium.

Suitable for Titanium Structure Parts for Aircraft

MTIX cutter with wide range of insert nose-radius and large ramping angle availiability is suitable for variable application of titanium structure parts for aircraft.

Large Application Range



ISO	Grade	Coating Thickness (µm)	Features
S	ACM300	3	Realises superb stability in machining of Titanium, due to a high-strength carbide substrate and highly chipping-resistance coating.

Milling Cutters

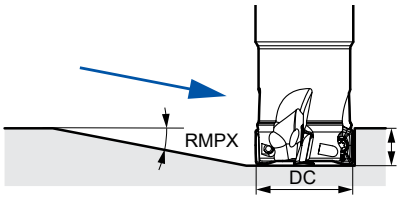
Recommended Cutting Conditions

Min. - **Optimum** - Max.

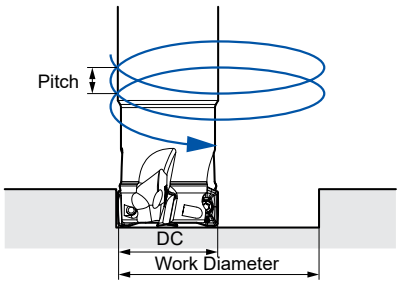
ISO	Material	Cutting Speed (m/min)	Feed Rate (mm/t)	a_p (mm)	Grade
S	Titanium	30–**60**–90	0,05–**0,10**–0,15	<13	ACM300

Ramping / Helical Milling Upper Limits

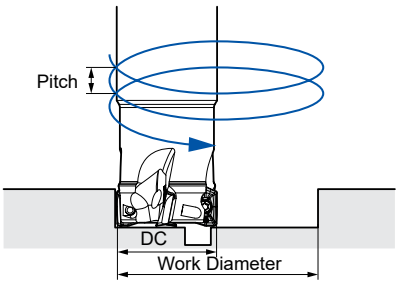
Ramping



Flat Bottom Machining



Machining with Prepared Hole



Tools		Ramping
DC Ø (mm)	Nose Radius	Max. RMPX (°)
Ø 32	RE ≥ 5,0	8,4
	RE ≤ 4,0	12,2
Ø 50	RE ≥ 5,0	3,6
	RE ≤ 4,0	5,6
Ø 63	RE ≥ 5,0	2,5
	RE ≤ 4,0	3,9

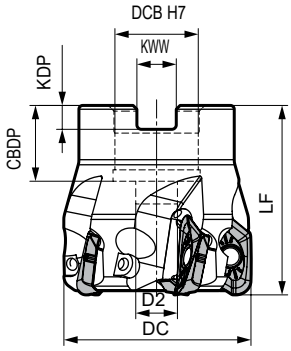
Tools		Flat Bottom Machining				Machining with Prepared Hole	
DC Ø (mm)	Nose Radius	Max. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)
Ø 32	4,0	55,3	13,0	55,2	13,0	45,9	3,0
	0,8	61,3	13,0	56,3	13,0	45,9	2,9
Ø 50	4,0	91,6	11,2	91,6	11,2	81,9	2,8
	0,8	97,3	13,0	92,2	11,0	81,9	2,7
Ø 63	4,0	117,6	10,1	117,6	10,1	107,9	2,7
	0,8	123,3	11,7	118,2	9,9	107,9	2,6

● = Euro stock

Recommended Tightening Torque (N·m)

Rake Angle	Radial	-9° – -6°
	Axial	8° – 14°

13 mm 90°



Body - MTIX (Shell Type)

Dimensions (mm)

Insert Radius RE	Cat. No.	Stock	DC	DCB	LF	D2	KWW	KDP	CBDP	No. of Teeth	Weight (kg)
≤ 4,0	MTIX 16050RS05	●	50	22	50	11	10,4	6,3	20	5	0,33
	16063RS06	●	63	22	50	11	10,4	6,3	20	6	0,34
≥ 5,0	MTIX16050RS05-5,0	●	50	22	50	11	10,4	6,3	20	5	0,62
	16063RS06-5,0	●	63	22	50	11	10,4	6,3	20	6	0,63

→ H69

Inserts are sold separately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench	Handle Grip	Wrench Bit
MTIX 16050RS05(-5,0) 16063RS06(-5,0)	BFTX0409IP	3,0	–	HPS1015	TPB15IP

Identification Details

MTIX	16	050	R	S	05
Cutter Series	Insert Size	Cutter Diameter	Feed Direction	Metric	Number of Teeth

Inserts

Dimensions (mm)

Application	Coated Carbide
High Speed / Light Cut	
General Purpose	S
Roughing	S

Cat. No.	ACM300	RE (mm)	Fig.
XOMT 160508PEER-E	●	0,8	1
160512PEER-E	●	1,2	1
160516PEER-E	●	1,6	1
160520PEER-E	●	2,0	1
160530PEER-E	●	3,0	1
160540PEER-E	●	4,0	1
160550PEER-E	●	5,0	2
160560PEER-E	●	6,0	2
160564PEER-E	●	6,35	2

Fig. 1

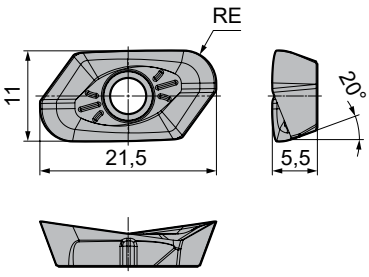
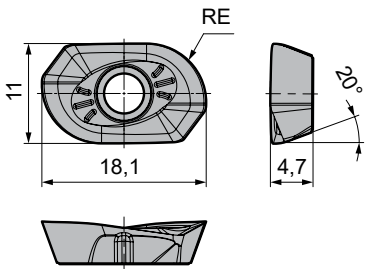


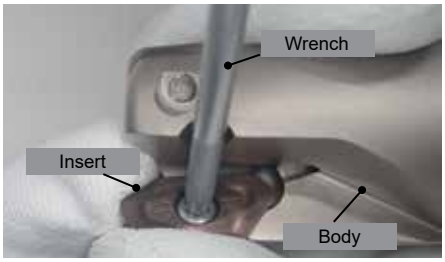
Fig. 2



Inserts with nose radius of RE ≥ 5,0 are for use with bodies that have a "-5,0" part number suffix

New

Precautions for Mounting

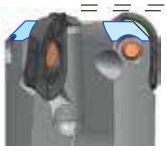
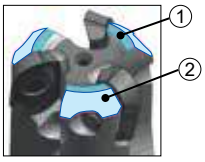


(1) Clean the mounting seat and contact parts.

(2) Apply screw lubrication to the screw thread as well as the screw head face to prevent seizure.

(3) While pressing the insert solidly against the seat surface, tighten at the screws with the included wrench.

(4) After tightening, check that there are no gaps between the surfaces.

Cutter Body	MTIX16 ____	MTIX16 ____-5,0
Insert Radius RE ≤ 4,0 mm	**OK**	Not recommended. The insert has no support from the cutter body.
Insert Radius RE ≥ 4,0 mm	OK with modification  1,5 mm less height	**OK**
	Modification method ① Grind 1,5 mm from top ② Add chamfer 4,5 mm	

Cutting Performance

Ti 6Al4V, Machine: DMU80P (HSK100)

Cutter: Dia. 50 mm, 5 teeth, Insert: 16-18 size, R 4,0

v_c = 60 m/min
f_z = 0,12 mm/teeth
a_p = 10 mm
a_e = 21 mm
HP coolant
70 bar

MTIX

Competitor

v_c = 50 m/min
f_z = 0,12 mm/teeth
a_p = 4 mm
a_e = 50 mm
HP coolant
70 bar

3°

MTIX

Competitor

v_c = 50 m/min
f_z = 0,12 mm/teeth
a_p = 4 mm
a_e = 50 mm
HP coolant
70 bar

5,5°

MTIX

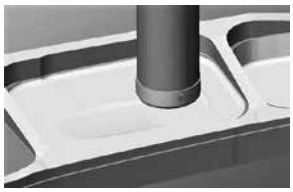
Impossible

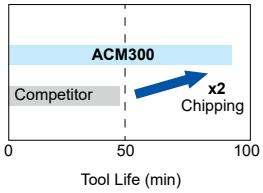
Competitor

Application Example

Structural Parts, Ti 6Al4V, Countering / Ramping

ACM300 achieved twice longer tool life against competitor's grade.





Cutter: MTIX 16050RS05 (Ø 50, No. of teeth:5)
Insert: XOMT 160540 PEER-E (ACM300)

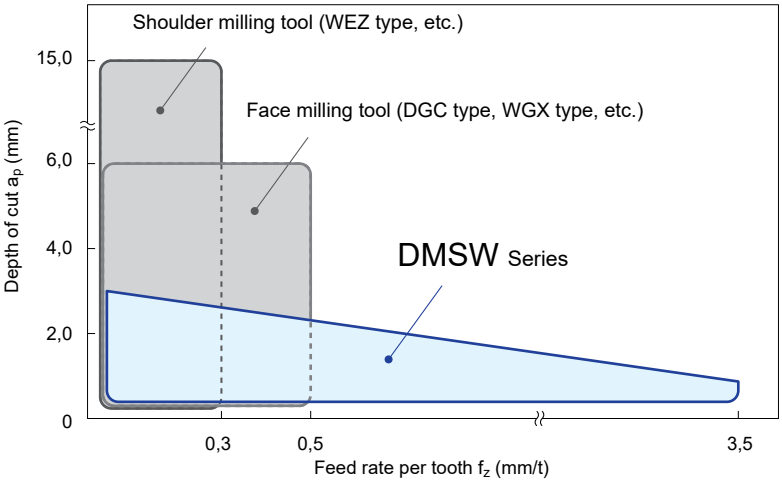
Cutting Data: v_c = 50 M/min, a_p = 4 mm, f_z = 0,12mm/t, a_e = 10 mm, wet

New

General Features

- High productivity thanks to an ultra-high metal removal rate as well as high economic efficiency, due to the stable six-edged insert.
- The arc-shaped cutting edge reduces the cutting force to a minimum. High-efficiency machining at maximum feed rate per tooth of 3,5 mm/t is possible.

Application Range



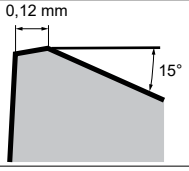
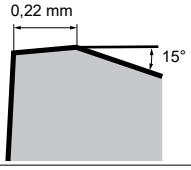
- Cutting depths up to 3 mm can be achieved. Feed rate per tooth up to 3,5 mm/t.
- Increases productivity.

Product Range

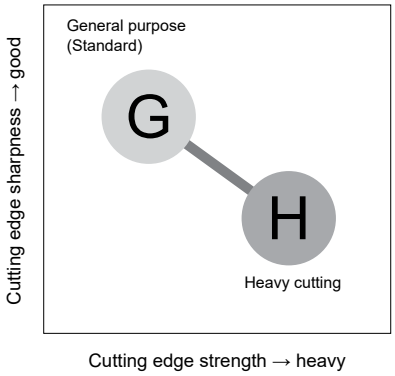
Type	Cat. No.	Diameter range (mm) / No of teeth												Shape
		Ø35	Ø40	Ø42	Ø50	Ø52	Ø63	Ø66	Ø80	Ø85	Ø100	Ø125	Ø160	
Shell	DMSW 08000RS				4 5	4 5	4 5* 6*	5 6	6 8	6 8	6	8	10	
	DMSW 08000R (Inch)				4 5		4 5 6		6 8		6	8	10	
Shank	DMSW 08000E	2	3		3		4					→ H8		
	DMSW 08000EL	2	3		3		4							
Modular	DMSW 08000M	2	3	3								→ H9		

* Different shank diameters in stock

Chipbreaker

Work Material	P Steel M Stainless steel K Cast iron	P Steel M Stainless steel K Cast iron
Applications	Main chipbreaker general-purpose to interrupted milling	Roughing, heavy interrupted cutting and hardened steel milling
	General purpose	High strength
Chip breaker	**G** type	**H** type
Cutting edge cross section		

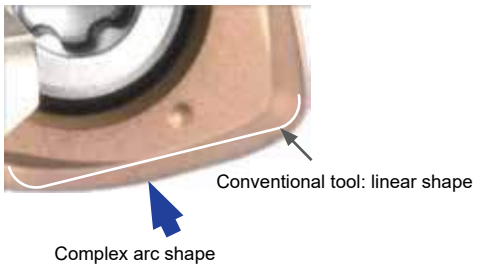
Chipbreaker Selection Guide

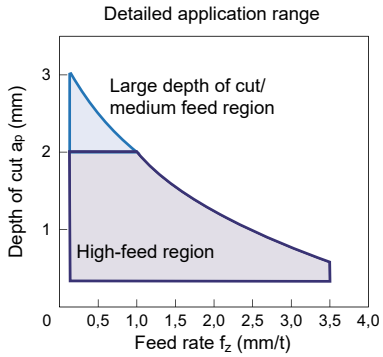


New

Features

- A small chip cross-section due to a small cutting angle enables high feed rates per tooth.

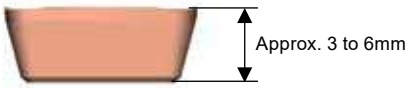




- Economical double-sided insert with 6-corner specification. Reassuring thick at 7 mm.

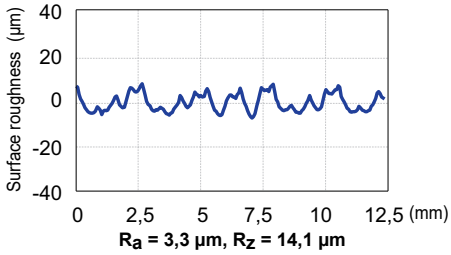
WNMU type

Conventional tool

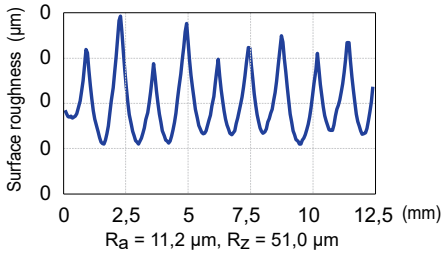


- Even at high feedrates of 2,0 mm/t or more, a reasonable surface finish can be attained.

DMSW type



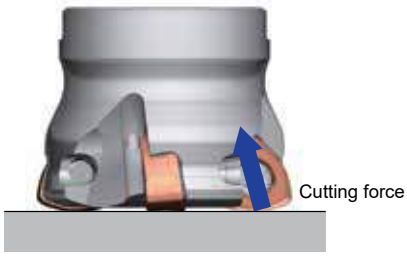
Competitor's product A (high-feed tool)



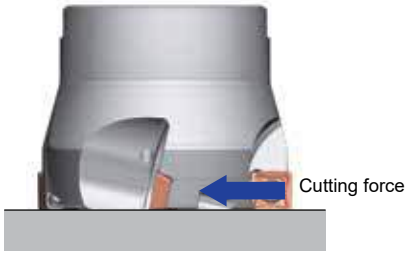
Machine:	Vertical machining centre BT50,	Work material: C50	Insert:	WNMU 0807ZNER-G (ACU2500)
Tool:	DMSW 08063RS04		Cutting data:	v_c = 150 m/min, f_z = 2,5 mm/t, a_p = 0,5 mm, a_e = 40 mm, dry

- Small cutting angle (15°) controls cutting force toward the back force direction.
  Suppresses chatter in long tool overhang machining, increasing efficiency.

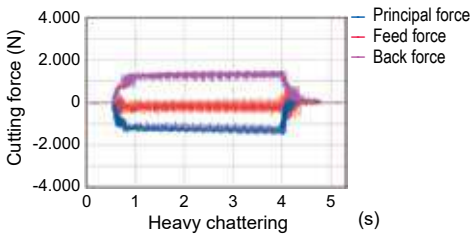
DMSW type



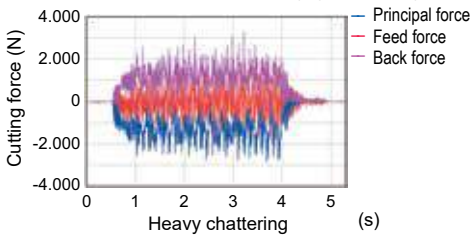
(Reference) Shoulder milling tool



DMSW type



Competitor's product B (high-feed tool)



Machine:	Vertical machining centre BT50, Work material: C50
Tool:	DMSW 08050RS04
Insert:	WNMU 0807ZNER-G (ACU2500)
Cutting data:	v_c = 160 m/min, f_z = 0,65 mm/t, a_p = 0,80 mm, a_e = 45 mm, dry

Precautions for Corner Finishing

Actual machined corners will have uncut and overcut portions due to the shape of the inserts.

Fig. 1

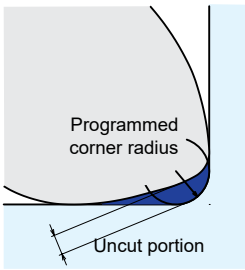
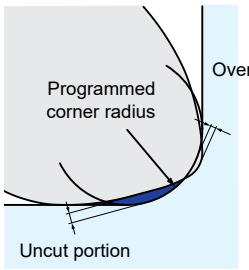


Fig. 2

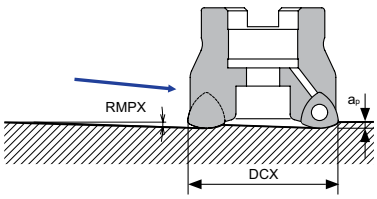


Programmed corner radius	Uncut portion	Overcut portion	Fig.
2,0	1,22	0	1
2,5	1,08	0	1
3,0	0,95	0	1
3,5	0,83	0,04	2

(mm)

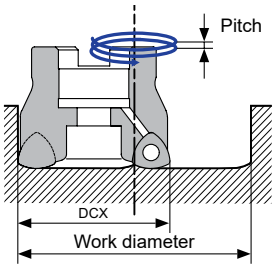
Ramping/Helical Milling Upper Limit

Ramping



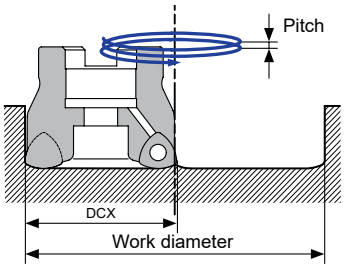
Helical Milling

≤ Min. diameter



Below the min. machining diameter: Centre uncut portion cannot be removed by traverse cutting with the same cutter.

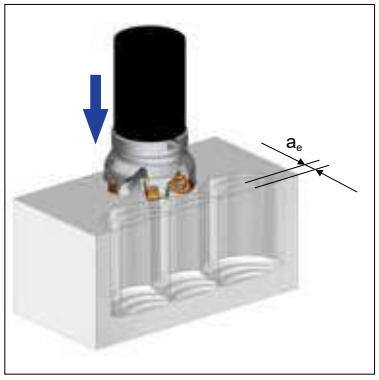
≥ Max. diameter



Above the max. machining diameter: Centre uncut portion can be removed by traverse cutting with the same cutter.

Max. dia. DCX (mm)	Ramping	Helical milling					
	Max. ramping angle RPMX (°)	Max. machining dia. (mm)	Max. pitch (mm/rev)	Standard diameter (mm)	Max. pitch (mm/rev)	Min. machining dia. (mm)	Max. pitch (mm/rev)
35	0,5	069,3	1,3	53,5	0,5	052,0	0,5
40	0,8	079,3	2,0	63,4	1,0	060,2	0,5
42	0,8	083,3	2,0	67,4	1,0	063,9	0,5
50	1,4	099,3	2,0	83,3	2,0	079,1	1,0
52	1,4	103,3	2,0	87,3	2,0	082,8	1,0
63	1,2	125,3	2,0	109,3	2,0	103,6	1,0
66	1,2	131,3	2,0	115,3	2,0	109,4	1,0
80	1,2	159,3	2,0	143,2	2,0	134,0	1,0
85	1,2	169,3	2,0	153,2	2,0	144,0	1,0
100	0,8	199,3	2,0	183,2	2,0	174,0	1,0
125	Not recommended						
160	Not recommended						

Plunge Cutting Upper Limit



Max. a_e (mm)	Max. f_z (mm/t)
10	0,2

Recommended Cutting Conditions

min.–optimum–max.

ISO	Work material	Hardness	Cutting speed v_c (m/min)	Feed rate f_z (mm/t)
P	General steel	< 280 HB	100–160–250	1,0–1,5–2,0
	Alloy steel	< 280 HB	100–160–200	1,0–1,5–1,8
	Alloy steel	< 42 HRC	100–150–180	0,8–1,0–1,2
M	Stainless steel	–	80–120–150	0,8–1,0–1,2
K	Cast iron	–	100–160–250	1,0–1,5–1,8
H	Hardened steel	< 52 HRC	80–100–120	0,3–0,5–0,7

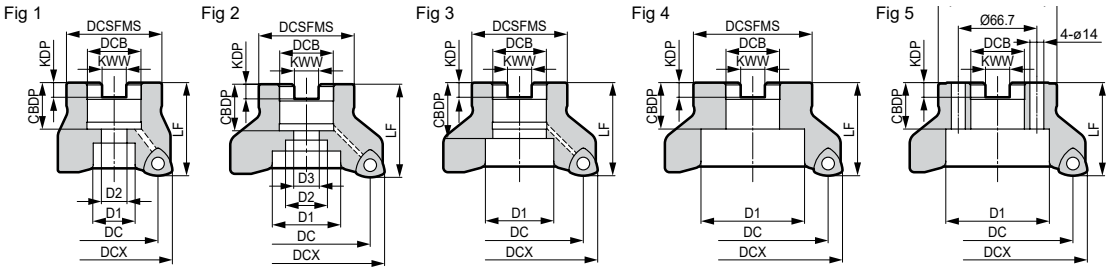
The above figures are guidelines for use with BT50 machine tools at depth of cut (a_p) of 1,5 mm.
The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.

"Sumi Dual Mill"
DMSW 08000 R(S)

New

Rake angle	Radial	-7° to -10°
	Axial	-6°

3 mm, 15°



Body (Shell Type)

Dimensions (mm)

	Cat. No.	Stock	DCX	DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2	D3	Number of teeth	Weight (kg)	Fig.
Metric	DMSW 08050RS04	●	50	33,4	41	40	22	10,4	6,3	20	16,7	11	–	4	0,25	1
	08050RS05	●	50	33,4	41	40	22	10,4	6,3	20	16,7	11	–	5	0,24	1
	08052RS04		52	35,4	41	40	22	10,4	6,3	20	17	11	–	4	0,27	1
	08052RS05		52	35,4	41	40	22	10,4	6,3	20	17	11	–	5	0,25	1
	08063RS04	●	63	46,4	50	40	22	10,4	6,3	20	18	11	–	4	0,46	1
	08063RS05	●	63	46,4	50	40	22	10,4	6,3	20	18	11	–	5	0,46	1
	08063RS06	●	63	46,4	50	40	22	10,4	6,3	20	18	11	–	6	0,44	1
	08063RS05-27	●	63	46,4	50	50	27	12,4	7	22	20	14	–	5	0,55	1
	08063RS06-27	●	63	46,4	50	50	27	12,4	7	22	20	14	–	6	0,53	1
	08066RS05-27		66	49,4	50	50	27	12,4	7	22	20	14	–	5	0,60	1
	08066RS06-27		66	49,4	50	50	27	12,4	7	22	20	14	–	6	0,58	1
	08080RS06	●	*80	63,3	55	50	27	12,4	7	22	20	14	–	6	0,88	1
	08080RS08	●	*80	63,3	55	50	27	12,4	7	22	20	14	–	8	0,84	1
	08100RS06	●	100	83,3	70	50	32	14,4	8	32	46	–	–	6	1,29	3
	08125RS08	●	125	108,3	80	63	40	16,4	9	29	52	29	–	8	2,41	1
	08160RS10	●	160	143,3	130	63	40	16,4	9	29	90	–	–	10	4,73	5
Inch	DMSW 08050R04	❍	50	33,4	41	40	22,225	8,4	5	20	16,7	11	–	4	0,25	1
	08050R05	❍	50	33,4	41	40	22,225	8,4	5	20	16,7	11	–	5	0,24	1
	08063R04	❍	63	46,4	50	40	22,225	8,4	5	20	18	11	–	4	0,46	1
	08063R05	❍	63	46,4	50	40	22,225	8,4	5	20	18	11	–	5	0,46	1
	08063R06	❍	63	46,4	50	40	22,225	8,4	5	20	18	11	–	6	0,44	1
	08080R06	❍	*80	63,3	70	63	31,75	12,7	8	32	27	18	–	6	1,32	1
	08080R08	❍	*80	63,3	70	63	31,75	12,7	8	32	27	18	–	8	1,28	1
	08100R06	❍	*100	83,3	70	63	31,75	12,7	8	32	46	27	18	6	1,75	2
	08125R08	❍	125	108,3	80	63	38,1	15,9	10	35,5	55	30	–	8	2,55	1
	08160R10	❍	160	143,3	100	63	50,8	19,1	11	38	72	–	–	10	4,18	4

Take note of the cutter mounting size (DCB) when selecting a cutter. Inserts are sold seperately.

For mounting the Ø 80 mm, Ø 85 mm and Ø 100 mm sized cutters marked with * to an arbor, use a JIS B1176 hexagonal socket bolt (metric specification : M12x30 to 35 mm, inch specification: M16x40 to 45 mm).

Parts

Applicable cutters	Insert screw		Wrench	Handle grip	Wrench bit
		N·m			
DMSW 08160R(S)10	BFTX0513IP	5,0	TRDR20IP	–	–
Other than above			–	HPL2025	TRB20IP

Identification Details

DMSW 08 063 R S 05 - 27

Cutter series	Insert size	Cutter diameter	Feed direction	Metric	Number of teeth	Mounting size

Recommended Cutting Conditions

→ G.65

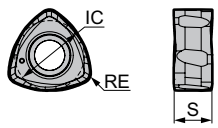
Inserts

Dimension (mm)

Application	Coated carbide				
High speed / Light cut		P		K	
General purpose	P M K S	P	P	K	K
Roughing	P M K S		P		K

Cat. No.	ACU2500	ACP2000	ACP3000	ACK2000	ACK3000	IC	S	RE	Fig.
WNMU 0807ZNER-G	●	●	●	●	●	13	7	1,6	1
WNMU 0807ZNER-H	●	●	●			13	7	1,6	1

Fig 1



● = Euro stock ❍ = Japan stock

High Feed Milling of Steel, Stainless Steel, Die Steel and Cast Iron

1,5 mm 20° (MSX 08000□□)
2,0 mm 20° (MSX 12000□□)
2,5 mm 20° (MSX 14000□□)

→ H10-13

Fig. 1

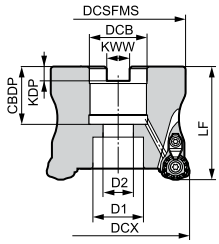
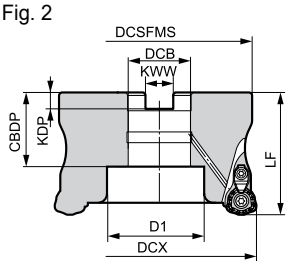


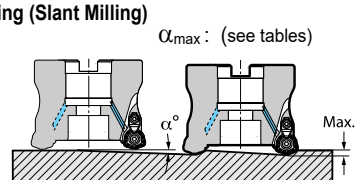
Fig. 2



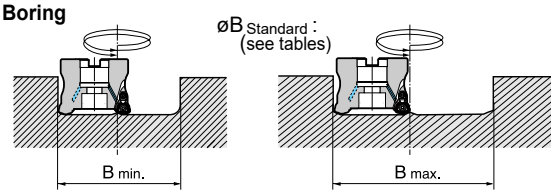
Body

Cat. No.	Stock	Dimensions (mm)									No. of teeth	Helical Boring øB (max-min)	Ramping αmax.	Weight (Kg)	Fig.
		DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2					
MSX 08040 RS	●	40	37	45	16	8,4	5,6	18	13,5	9	4	65–78	1°30'	0,2	1
MSX 12050 RS	●	50	47	50	22	10,4	6,3	20	18	11	4	78–99	2°30'	0,3	1
12052 RS	●	52	47	50	22	10,4	6,3	20	18	11	4	82–103	2°00'	0,3	1
12063 RS	●	63	60	50	22	10,4	6,3	20	18	11	5	104–125	1°30'	0,4	1
12066 RS	●	66	60	63	27	12,4	7,0	25	20	13,5	5	110–131	1°00'	0,4	1
MSX 14050 RS	●	50	47	50	22	10,4	6,3	20	17	11	3	73–98	3°30'	0,3	1
14063 RS	●	63	60	50	22	10,4	6,3	20	18	11	4	99–124	2°00'	0,6	1
14066 RS	●	66	60	63	27	12,4	7,0	25	13,5	20	4	107–132	2°00'	0,7	1
14080 RS	●	80	76	63	27	12,4	7,0	25	13,5	20	5	133–158	1°30'	1,2	1
MSX 14100 RS	●	100	96	63	32	14,4	8,5	32	-	44	6	173–198	1°00'	1,8	2

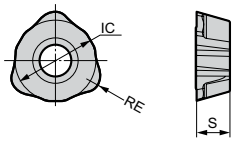
Ramping (Slant Milling)



Helical Boring



Inserts



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

Cat. No.	ACP200	ACP300	ACK200	ACK300	Dimensions (mm) IC	S	RE
WDMT 0804 ZDTR	●	●		●	8,5	4,0	2,0
0804 ZDTR-H	●	●	❍	●			
WDMT 1205 ZDTR	●	●		●	12	5,0	2,0
1205 ZDTR-H	●	●	❍	●			
WDMT 1406 ZDTR	●	●	❍	●	14	6,0	2,0
1406 ZDTR-H	●	●		●			

ZDTR-H : Stronger cutting edge

Recommended Cutting Conditions

Depth of cut : a_p (mm)
Feed rate : f_z (mm/tooth)

Work Material	Insert Type	Cutting Speed v_c (m/min)	Insert Cat. No.	ø 40 a_p	ø 40 f_z	ø 50–66 a_p	ø 50–66 f_z	ø 80–100 a_p	ø 80–100 f_z
General Steel (Below HB200)	ACP200	100-**150**-200	WDMT 0804	1,0	1,2	–	–	–	–
			WDMT 1205	–	–	1,2	1,4	–	–
			WDMT 1406	–	–	1,5	1,5	1,5	1,5
Alloy Steel (Below HRC45)	ACP200	80-**130**-180	WDMT 0804	0,8	1,2	–	–	–	–
			WDMT 1205	–	–	1,0	1,4	–	–
			WDMT 1406	–	–	1,3	1,5	1,3	1,5
Stainless Steel (X5CRNI1810)	ACP300	80-**120**-150	WDMT 0804	1,0	0,8	–	–	–	–
			WDMT 1205	–	–	1,2	1,2	–	–
			WDMT 1406	–	–	1,5	1,3	1,5	1,3
Cast Iron GG, GGG	ACK300	100-**150**-200	WDMT 0804	1,0	1,4	–	–	–	–
			WDMT 1205	–	–	1,2	1,5	–	–
			WDMT 1406	–	–	1,5	1,8	1,5	1,8
Hardened Steel (Below HRC50)	ACK300	40-**80**-100	WDMT 0804	0,5	0,8	–	–	–	–
			WDMT 1205	–	–	0,6	1,0	–	–
			WDMT 1406	–	–	1,0	1,2	1,0	1,2

- The above recommended cutting conditions may require adjustment according to machine rigidity and work rigidity.
- The above figures are guidelines for use with the BT50 machine tool.

Spare Parts

Screw		Wrench	Clamp	C Ring	Cramp screw	Applicable endmill
BFTX 0306 IP	**2,0**	TRDR 08 IP	CCH 3,5	CR 03	BFTX 03510 IP 08	MSX 08000RS
BFTX 0409 IP	**3,0**	TRDR 15 IP	CCH 3,5	CR 03	BFTX 03510 IP 15	MSX 12000RS
BFTX 0511 IP	**5,0**	TRDR 20 IP	CCH 4,5	CR 03	BFTX 04513 IP 20	MSX 14000RS

Remark: If depth-of-cut exceeds 5 mm, reduce recommended feedrates by 50 %.
The conditions above are meant as a guide, please adjust the cutting conditions according to actual work material and machine ridgidity.

WFXH Type

Expansion

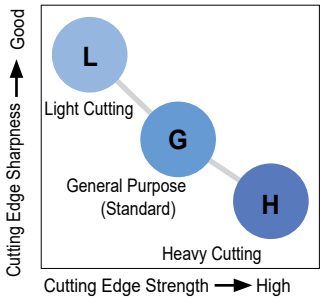
General Features

WaveMill WFXH type is a high efficiency, multi-purpose cutter, that uses the WFX series inserts for high-feed roughing and a variety of processes.

Characteristics

Stable, high-efficiency milling with superior cutting edge sharpness.
Supports various types of processes (ramping and helical milling).
Able to use the selection of inserts from the WFX series.

Chipbreaker Selection



Work Material	P M K Steel, Stainless Steel, Cast Iron			N Aluminium Alloy
Breaker	L Type	G Type	H Type	S Type
Characteristic	Low Cutting Force	General Purpose	Strong Edge	Sharp Edge
Cutting Edge Figure	20°	15°	10°	25°
Work Material Application	Light Cutting Low rigidity Milling Low-Burr Design	**Main Chipbreaker** General to Interrupted Milling	Heavy Cut Heavy Interrupted Machining Tempered Steel	Non-Ferrous Metal

Notes on Corner Finishing - Remaining Material

Actual machined corners will have uncut and overcut portions due to the shape of the inserts.

Fig. 1

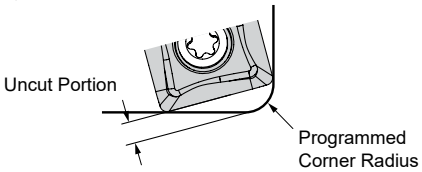
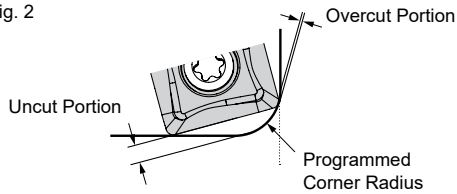


Fig. 2



● WFXH 08000 RS Type

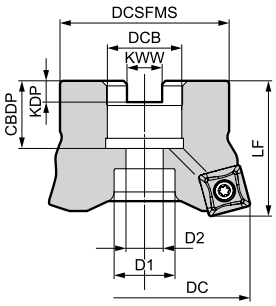
Programmed Corner R	SOMT 08○○04-□			SOMT 08○○08-□			SOMT 08○○12-□		
	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape
2,0	1,41	0	Fig. 1	1,30	0	Fig. 1	1,21	0	Fig. 1
2,5	1,30	0,02	Fig. 2	1,19	0,01	Fig. 2	1,09	0	Fig. 2
3,0	-	-	-	-	-	-	0,98	0,05	Fig. 2

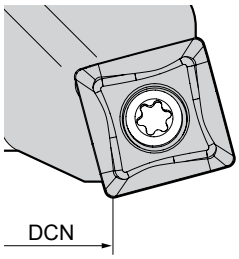
● WFXH 12000 RS Type

Programmed Corner R	SOMT 12○○04-□			SOMT 12○○08-□			SOMT 12○○12-□			SOMT 12○○16-□		
	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape
2,0	2,58	0	Fig. 1	2,48	0	Fig. 1	2,37	0	Fig. 1	2,25	0	Fig. 1
2,5	2,47	0	Fig. 1	2,37	0	Fig. 1	2,25	0	Fig. 1	2,14	0	Fig. 1
3,0	2,36	0	Fig. 1	2,26	0	Fig. 1	2,14	0	Fig. 1	2,11	0	Fig. 1
3,5	2,24	0,01	Fig. 2	2,14	0	Fig. 1	2,03	0	Fig. 1	1,91	0	Fig. 1
4,0	-	-	-	2,03	0,04	Fig. 2	1,91	0,03	Fig. 2	1,8	0,01	Fig. 2

Minimum Cutting Diameter

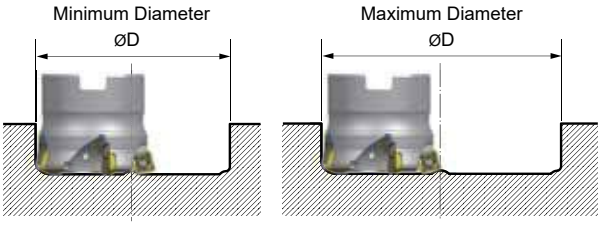
Minimum cutting diameter (DCN) will depend on the insert that is used. Using an insert with a large nose radius is recommended for the WFXH type.





Body Cat. No.	DC	DCN based on insert nose			
		RE0,4	RE0,8	RE1,2	RE1,6
WFXH 08025 M12Z2	25	10,4	10,9	11,5	-
08032 M12Z3	32	17,4	17,9	18,5	-
WFXH 08040 RS	40	25,4	25,9	26,5	-
08050 RS	50	35,4	35,9	36,5	-
08050 RSZ6	50	35,4	35,9	36,5	-
08063 RS	63	48,4	48,9	49,5	-
WFXH 12040 M12Z3	40	16,6	17,1	17,5	18,1
WFXH 12050 RS	50	26,6	27,2	27,7	28,2
12063 RS	63	39,5	40,0	40,4	41,1

■ Taper Cutting and Helical Milling



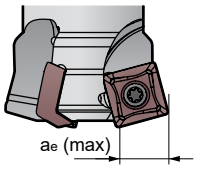
Minimum and Maximum Diameters

Ramping Angle

Insert Cat. No.	DC	Helical Millilng		Taper Cutting
		Min.	Max.	Max. Ramping Angle
SOMT 08○○04-□	25	35	49	1°30'
	32	49	63	0°30'
	40	65	79	0°30'
	50	Impossible	Impossible	0°30'
	63	Impossible	Impossible	Impossible
SOMT 08○○08-□	25	35	48	3°
	32	49	62	1°30'
	40	65	78	1°
	50	85	98	0°30'
	63	111	124	0°30'
SOMT 08○○12-□	25	34	47	4°30'
	32	48	61	2°30'
	40	64	77	1°30'
	50	84	97	1°
	63	110	123	0°30'

Insert Cat. No.	DC	Helical Millilng		Taper Cutting
		Min.	Max.	Max. Ramping Angle
SOMT 12○○04-□	40	56	79	1°
	50	76	99	0°30'
	63	Impossible	Impossible	Impossible
SOMT 12○○08-□	40	56	78	1°30'
	50	76	98	1°
	63	102	124	0°30'
SOMT 12○○12-□	40	55	77	2°30'
	50	75	97	1°30'
	63	101	123	1°
SOMT 12○○16-□	40	55	76	3°30'
	50	75	96	2°
	63	101	122	1°30'

■ Maximum Width of Cut when Plunge Milling



Insert Cat. No.	Max. Width of Cut ae (max)
SOMT08	6 mm
SOMT12	10 mm

Lower the feed rate when plunge milling.

■ Recommended Cutting Conditions

ISO	Work Material	Grade	Cutting Speed (vc (m/min)	Insert Cat. No.	Ø 25		Ø 32		Ø 40		Ø 50		Ø 63	
					ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)	ap (mm)	fz (mm/t)
P	General Steel <200HB	ACP200	100 - **150** - 200	SOMT08	0,8	0,8	0,8	0,8	-	-	0,8	0,8	0,8	0,8
				SOMT12	-	-	-	-	1,0	1,0	1,0	1,0	1,0	1,0
	Alloy Steel <HRC45	ACP200	80 - **130** - 180	SOMT08	0,7	0,8	0,7	0,8	-	-	0,7	0,8	0,7	0,8
				SOMT12	-	-	-	-	0,8	1,0	0,8	1,0	0,8	1,0
K	Stainless Steel (X5CrNiS18 10, other)	ACM300	80 - **120** - 150	SOMT08	0,8	0,7	0,8	0,7	-	-	0,8	0,7	0,8	0,7
				SOMT12	-	-	-	-	1,0	0,8	1,0	0,8	1,0	0,8
M	Cast Iron FC, FCD	ACK300	100 - **150** - 200	SOMT08	0,8	1,0	0,8	1,0	-	-	0,8	1,0	0,8	1,0
				SOMT12	-	-	-	-	1,0	1,2	1,0	1,2	1,0	1,2
H	Hardened Steel <HRC50	ACK300	40 - **80** - 100	SOMT08	0,5	0,5	0,5	0,5	-	-	0,5	0,5	0,5	0,5
				SOMT12	-	-	-	-	0,6	0,8	0,6	0,8	0,6	0,8

The above recommended cutting conditions may require adjustment according to machine rigidity and work rigidity. The above figures are guidelines for use with the BT50 machine tool.
The above conditions assume a tool overhang length of L/D = 3 (i.e. overhang length is 3 times tool diameter) or less.
When tool overhang is more than L/D = 3 and less or equal L/D = 5, settings should be adjusted to approximately 70 % to 80 % of those indicated in the above cutting conditions (i.e. ap and fz).
When tool overhang is more than L/D = 5 and less or equal L/D = 8, settings should be adjusted to approximately 50 % to 60 % of those indicated in the above cutting conditions (i.e. ap and fz).

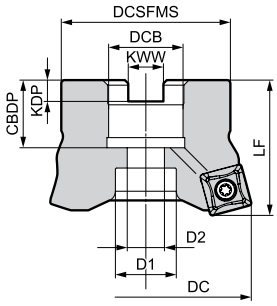
WFXH 08000 RS

Expansion

High Efficiency Machining for Steel, Stainless Steel, Die Steel and Non-Ferrous Metal

Rake Angle	Radial	–6°
	Axial	6°

1,5 mm 15°



Body - WFXH08000RS

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2		
WFXH 08040 RS	❍	40	33	40	16	8,4	5,6	18	14	9	4	0,2
08050 RS	❍	50	41	40	22	10,4	6,3	20	18	11	5	0,3
08050 RSZ6	❍	50	41	40	22	10,4	6,3	20	18	11	6	0,3
08063 RS	❍	63	50	40	22	10,4	6,3	20	18	11	6	0,5

→ H15

Inserts are not included.

Identification Details

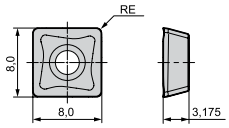
WFX	H	08	040	R	S	- Z6
Cutter Series	High Efficiency Milling	Insert Size	Cutter Diameter	Direction	Metric Type	Fine Pitch Type (Value is number of teeth)

Inserts

Dimensions (mm)

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

Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCU2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	RE
SOMT 080304 PZER L	●	❍	●	●	❍	❍	❍	●	●	●	–	–		0,4
080308 PZER L	●	❍	❍	●	●	❍	●	●	●	●	–	–		0,8
SOMT 080304 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–		0,4
080308 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–		0,8
080312 PZER G	●		●	●	●			●	●	●	–	–		1,2
SOMT 080308 PZER H	●	❍	●	●	●	❍	●	●	●	●	–	–		0,8
080312 PZER H	●		●	●	●		❍	●		●	–	–		1,2
SOET 080304 PZER G	●				❍			●	●		–	–	❍	0,4
080308 PZER G	●			❍			●			●	–	–	❍	0,8
080312 PZER G	●			●	❍			●	❍	❍	–	–	❍	1,2
SOET 080302 PZFR S*	–	–	–	–	–	–	–	–	–	–	●	●		0,2
080304 PZFR S*	–	–	–	–	–	–	–	–	–	–	●	●		0,4
080308 PZFR S*	–	–	–	–	–	–	–	–	–	–	●	●		0,8



* If the cutting edge lacks strength when performing high efficiency milling of non-ferrous metals, try G type chipbreakers (ACK300).

Spare Parts

Screw		Wrench
BFTX0306IP	2,0	TRDR08IP

Recommended Cutting Conditions

→ G69

Programming and Dimension Information

→ G68

● = Euro stock
❍ = Japan stock

⊟ = Not available

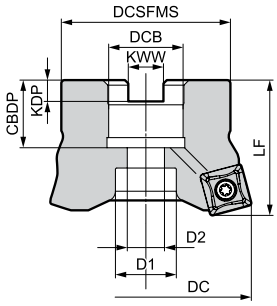
Recommended Tightening Torque (N·m)

”Wave Mill” Series
WFXH 12000 RS

High Efficiency Machining for Steel, Stainless Steel, Die Steel and Non-Ferrous Metal

Rake Angle		
	Radial	–6°
	Axial	6°

2,5 mm 15°



Body - WFXH12000RS

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		DC	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2		
WFXH 12050 RS	❍	50	41	40	22	10,4	6,3	20	18	11	4	0,3
12063 RS	❍	63	50	40	22	10,4	6,3	20	18	11	5	0,4

Inserts are not included.

⟶ H15

Identification Details

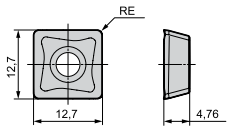
WFX	H	12	050	R	S
Cutter Series	High Efficiency Milling	Insert Size	Cutter Diameter	Direction	Metric Type

Inserts

Dimensions (mm)

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

Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCU2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	RE
SOMT 120408 PDER L	●	❍	●	●	●	❍	●	●	●	●	–	–		0,8
SOMT 120404 PDER G	●	❍	❍	●	●	❍	●	●	●	●	–	–		0,4
120408 PDER G	●	❍	●	●	●	❍	●	●	●	●	–	–	❍	0,8
120412 PDER G	●		❍	●	❍		●	❍	❍	●	–	–		1,2
120416 PDER G	●		●	●	●		❍	❍	❍		–	–		1,6
SOMT 120408 PDER H	●	❍	●	●	●	❍	●	●	●	●	–	–		0,8
SOET 120408 PDFR S*	–	–	–	–	–	–	–	–	–	–	●	●		0,8



* If the cutting edge lacks strength when performing high efficiency milling of non-ferrous metals, try G type chipbreakers (ACK300).

Spare Parts

Screw		Wrench
BFTX03512IP	3,0	TRDR15IP

Recommended Cutting Conditions

⟶ G69

Programming and Dimension Information

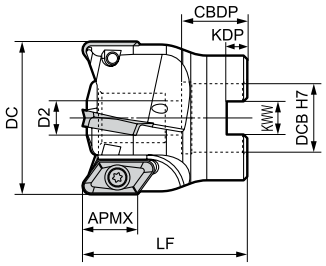
⟶ G68

WAX 3000 RS

16–18mm 90°

P	M	K	S	N
×	×	×		×

(Shellmill)



Body

(For inserts with nose radius ≤ 3,2 mm)

Cat. No.	Stock	Dimensions (mm)							No.of teeth	Weight (Kg)
		DC	DCB	LF	D2	KWW	KDP	CBDP		
WAX 3050 RS-3.2	●	50	22	50	11	10,4	6.3	21	4	0,34
3063 RS-3.2	●	63	22	50	11	10,4	6.3	21	5	0,6
3080 RS-3.2	●	80	27	50	13,5	12,4	7	23	5	1,0
WAX 3100 RS-3.2	●	100	32	63	18	14,4	8	26	6	2,2
3125 RS-3.2	●	125	40	63	22	16,4	9	29	7	3,5

Body

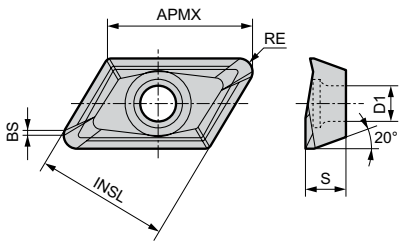
(For inserts with nose radius ≥ 4,0mm)

Cat. No.	Stock	Dimensions (mm)							No.of teeth	Weight (Kg)
		DC	DCB	LF	D2	KWW	KDP	CBDP		
WAX 3050 RS-4.0	●	50	22	50	11	10,4	6.3	21	4	0,34
3063 RS-4.0	●	63	22	50	11	10,4	6.3	21	4	0,6
3080 RS-4.0	●	80	27	50	13,5	12,4	7	23	5	1,0
WAX 3100 RS-4.0	❍	100	32	63	18	14,4	8	26	6	2,2
3125 RS-4.0	●	125	40	63	22	16,4	9	29	7	3,5

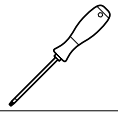
Inserts for WAX 3000 Type

Application	DLC Coated	Carbide
High Speed / Light cut	K N	N
General Purpose		N
Roughing		

Cat. No.	DL1000	H1	Dimensions (mm)					
			APMX	INSL	BS	RE	S	D1
AECT 160404 PEFRA	●	●	18	16,4	1,4	0,4	5	4,4
160408 PEFRA	●	●	18	16,4	1,0	0,8	5	4,4
160412 PEFRA	●	●	18	16,4	0,6	1,2	5	4,4
160416 PEFRA	●	●	17,5	16,4	0,5	1,6	5	4,4
160420 PEFRA	●	●	17,5	16,4	0,5	2,0	5	4,4
160430 PEFRA	●	●	17	16,4	0,7	3,0	5	4,4
160432 PEFRA	●	●	17	16,4	0,5	3,2	5	4,4
AECT 160440 PRFRA	●	●	16,5	16,4	0,5	4,0	5	4,4
160450 PEFRA	●	●	16	16,4	0,4	5,0	5	4,4



Spare Parts

Screw	Insert Wrench	Applicable Endmill
3,0 N·m		
BFTX 0408	TRD 15	Ø 50 – Ø 125

● = Euro stock
❍ = Japan stock

❑ = Delivery on request

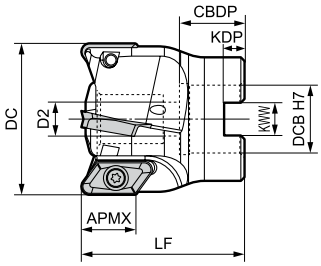
→ H61-63

N·m Recommended Tightening Torque (N·m)

WAX 4000 RS

22–24mm 90°

(Shellmill



Body

(For inserts with nose radius ≤ 3,2 mm)

Cat. No.	Stock	Dimensions (mm)							No.of teeth	Weight (Kg)
		DC	DCB	LF	D2	KWW	KDP	CBDP		
WAX 4050RS-3.2	❑	50	16	50	9	8,4	5,6	18	2	0,37
4063RS-3.2	❑	63	22	50	11	10,4	6,3	21	3	0,54
4080RS-3.2	❑	80	27	50	13,5	12,4	7	23	4	0,81
WAX 4100RS-3.2	❑	100	32	63	18	14,4	8	26	5	1,7
4125RS-3.2	❑	125	40	63	22	16,4	9	29	6	2,6

Body

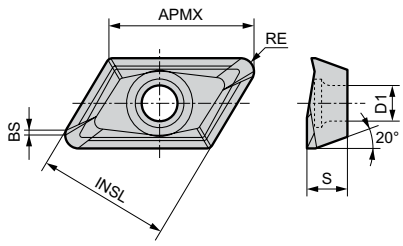
(For inserts with nose radius ≥ 4,0 mm)

Cat. No.	Stock	Dimensions (mm)							No.of teeth	Weight (Kg)
		DC	DCB	LF	D2	KWW	KDP	CBDP		
WAX 4050RS-4.0	❑	50	16	50	9	8,4	5,6	18	2	0,37
4063RS-4.0	❑	63	22	50	11	10,4	6,3	21	3	0,54
4080RS-4.0	❑	80	27	50	13,5	12,4	7	23	4	0,81
WAX 4100RS-4.0	❑	100	32	63	18	14,4	8	26	5	1,7
4125RS-4.0	❑	125	40	63	22	16,4	9	29	6	2,6

Inserts for WAX 4000 Type

Application	DLC Coated	Carbide
High Speed / Light cut	K N	N
General Purpose		N
Roughing		

Cat. No.	DL1000	H1	Dimensions (mm)					
			APMX	INSL	BS	RE	S	D1
AECT 220604 PEFRA	❑	❑	24	21,8	1,5	0,4	6,35	6
220608 PEFRA	❑	❑	24	21,8	1,2	0,8	6,35	6
220612 PEFRA	❑	❑	24	21,8	0,8	1,2	6,35	6
220616 PEFRA	❑	❑	24	21,8	0,4	1,6	6,35	6
220620 PEFRA	❑	❑	24	21,8	0,5	2,0	6,35	6
220630 PEFRA	❑	❑	23	21,8	0,6	3,0	6,35	6
220632 PEFRA	❑	❑	23	21,8	0,4	3,2	6,35	6
AECT 220640 PRFRA	❑	❑	22	21,8	1,2	4,0	6,35	6
220650 PEFRA	❑	❑	22	21,8	0,4	5,0	6,35	6



Spare Parts

Screw	Insert Wrench	Applicable Endmill
5,0 N·m		
BFTX0511N	TRD20	Ø 50 – Ø 125

→ H61-63

Expansion

Features

- **Drastically Reduced Runout Adjustment Time**
  Simple screw-fastening structure enables fine adjustments to be made easily.
- **Blade Through Coolant**
  Secures a supply of coolant to the cutting edge and breaks chips thoroughly.
- **Lightweight Aluminum Alloy Body**
  Utilizing aluminum alloy to achieve a total weight of less than 1,3 kg for a Ø 125 mm cutter with 22 teeth.

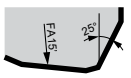
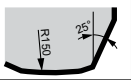
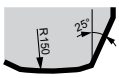
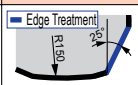
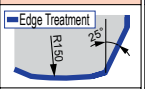
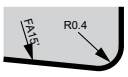
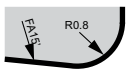
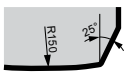
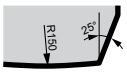
Product Range

Type	Cat. No.	Body Material	Diameter Range (mm) / No of Teeth									
			Ø 25	Ø 30	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100	Ø 125	Ø 160
Shell	ANXA 16000RS	Aluminum Alloy							6, 10, 14	8, 12, 18	10, 14, 22	12, 20, 28
	ANXA 16000R (Inch)	Aluminum Alloy							6, 10, 14	8, 12, 18	10, 14, 22	12, 20, 28
	ANXS 16000RS	Steel				4, 6	4, 6, 9	6, 8, 12	6, 10, 14	8, 12, 18	10, 14, 22	
	ANXS 16000R (Inch)	Steel						6, 8, 12	6, 10, 14	8, 12, 18	10, 14, 22	
Shank	ANXS 16000E	Steel	2	3, 4	3, 4	4, 6	4, 6, 9	→ H84				
Modu-lar	ANXS 16000M	Steel	2	3, 4	3, 4	4, 6		→ H86				

→ M58-M69

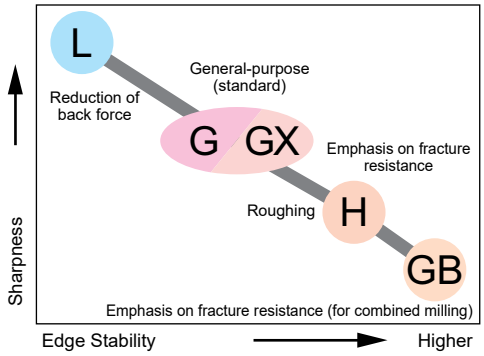
Inch Inch Bore

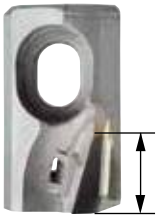
Blade Selection Guide

Work Material	N								
Applications	Finishing / Light Cutting	General Purpose	Roughing		Combined Milling *1	Corner Radius Milling	Corner Radius Milling	Finishing	Burr-free / Mirror Finishing
Features	Low Cutting Force	Standard	Long Edge	High Strength	High Strength	Corner Radius 0,4	Corner Radius 0,8	Wiper	Wiper
Type	L	G	GX	H	GB	-	-	W	WS
Cutting Edge Shape									
Edge Length(*2)	6,0 mm	6,0 mm	9,0 mm	6,0 mm	6,0 mm	6,0 mm	6,0 mm	2,0 mm	—

*1 Machining of components combining aluminum alloy and cast iron

Edge Selection Guide

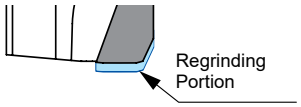


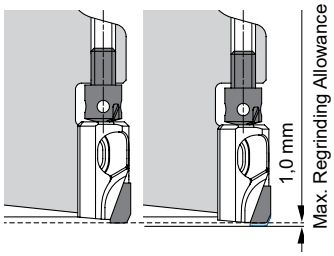


*2 Edge length
GX type = 9,0 mm

- **Reduces Running Costs by Drastically Increasing Blade, Insert Regrinding Allowance (to 1,0 mm)**

Assuming 0,2 mm of regrinding each time, an edge can be used up to 6 times.
(Peripheral edge cannot be reground.)





If you wish to use reground blades you shall use sets of blades with matching size of the same level in order to keep the balance.

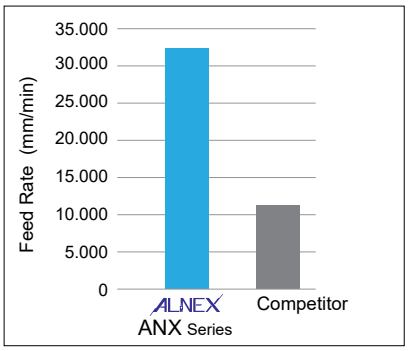
Performances

High-Speed / High-Efficiency Cutting

Realizes ultra-high efficiency machining with v_f = 30.000 mm/min

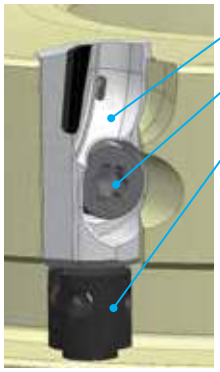
Comparison: Cutter Diameter Ø 100 mm

	Spindle Speed min^{-1}	Number of Teeth	Feed Rate v_f (mm/min)
ANX Series	18.000	18	32.400
Competitor	9.500	12	11.400

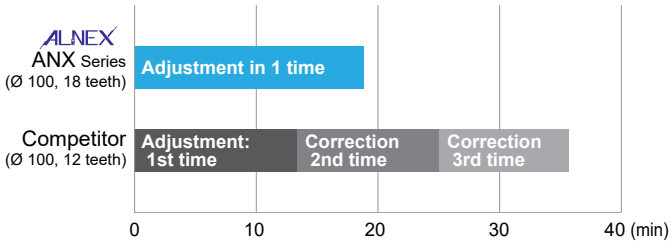


Drastically Reduces Runout Adjustment Time

- Simple screw-fastening structure
- Enables fine adjustments to be made easily
- High-rigidity body

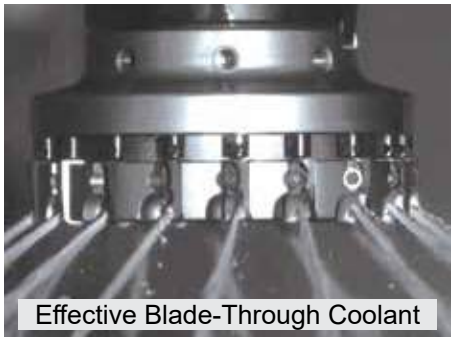


Adjustment Time for Runout Setting ≤ 5 µm



Already completed in 1st time setting, adjustment time reduced.

Chip Control



Blade-Through Coolant Chip Breaking

ALNEX ANX Series

Competitor

Work Material: G-AlSi12Cu
Cutting Conditions: v_c = 2500 m/min, f_z = 0,05 mm/t, a_p = 0,5 mm, wet

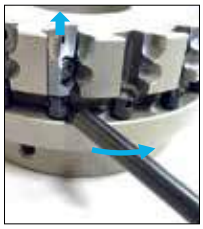
Adjustment of the Blades, Runout Alignment

①

Insert the blade into its seat.

②

While holding the blade against the seat, install the clamping bolt using the provided wrench, pre-tightening the bolt. (recommended pre-torque is 1 N·m)

③ 

Using the provided wrench for the height adjustment screw, set the height to your predetermined value.

④

Fully tighten the clamp bolt. (recommended torque is 2 N·m)

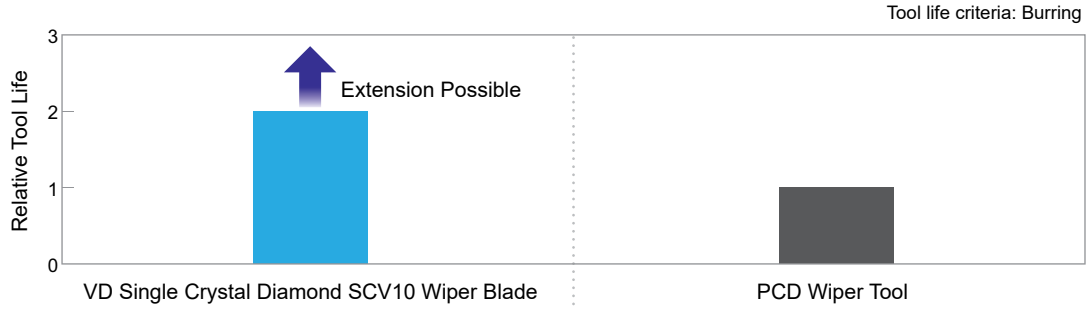
Expansion

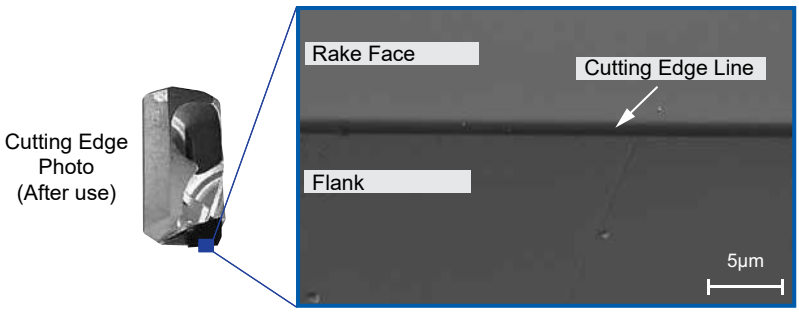
■ CVD Single Crystal Diamond SCV10 Wiper Blade

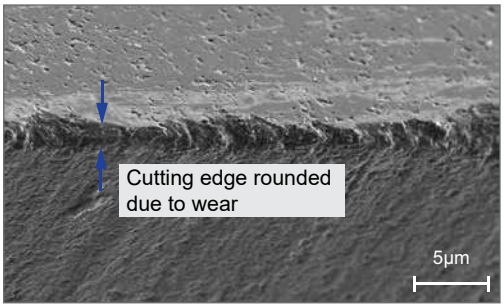
Wiper blade adopts high-strength single-crystal diamond using Sumitomo Electric Hardmetal's vapour phase synthesis technology.
Sharp cutting edge realises burr-free, mirror finish surface quality in aluminum alloy machining.
Superior wear resistance maintains cutting edge sharpness for a long time, reducing total tool costs.

■ Burr-free

Sharp cutting edge and excellent wear resistance suppress burrs over the long term.

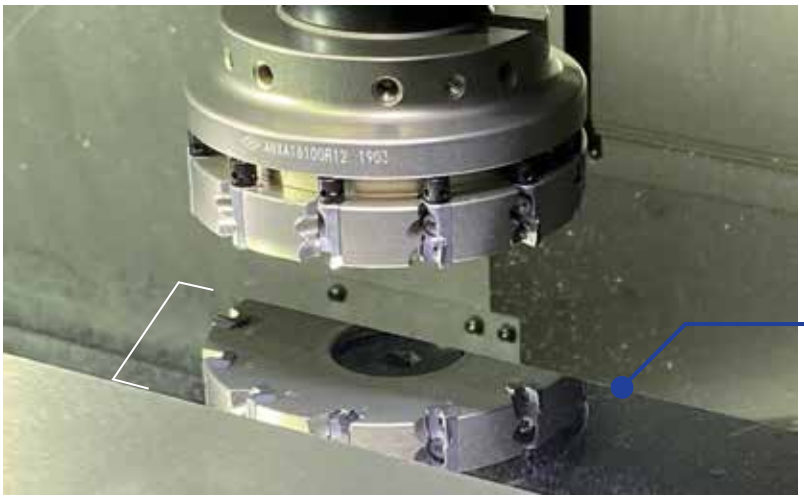


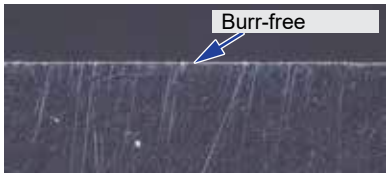




■ Mirror Finishing

Sharp cutting edge achieves mirror finish with cutting alone.





Workpiece surface after machining

Polycrystalline Diamond SUMIDIA DA1000 / DA90

Through the ideal combination of diamond particle size and binder, SUMIDIA DA1000/DA90 possess various features and is suitable for all kinds of applications such as machining of aluminum alloy and cemented carbide.

Grades, Features and Applications

Grade	Features	Applications	Diamond share (%)	Average grain size of diamond particles (μm)	Hardness HK (GPa)	TRS (GPa)
DA1000	High-density sintered grade made of ultra-fine grain diamond that exhibits excellent wear and fracture resistance as well as edge sharpness.	Machining of High-Silicon Aluminum Alloy, Rough, Interrupt and Finish Machining of Aluminum Alloy, Woodcraft or Wooden Board Cutting/Facing, General Finishing of Non-Ferrous Metals	90–95	≤ 0,5	50–60	≈ 2,60
DA90	Contains coarser diamond particles than other grades, giving it good wear resistance suitable for the machining of carbides and high-silicon aluminum. Shows the highest diamond content for excellent wear resistance.	Machining of High-Silicon Aluminum Alloy, Machining of Aluminum Composite (MMC), Green or Semi-Sintered Cemented Carbide & Ceramic Roughing, Machining of Sintered Ceramic/Stone/Rock	90–95	≤ 50	50–65	≈ 1,10

Grade Applications

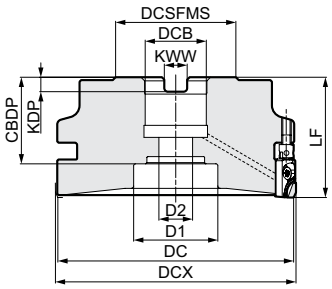
	Work Material	Applicable Grade	Example Parts
Aluminum	Sintered Aluminum, Wrought Aluminum Alloy	DA1000	Piston Liners, Machine Parts, etc.
	Alloys for Die Casting		Transmission Case, Oil Pan, Cylinder Block
	Alloys for Casting Low Si (≤ 12%)		Cylinder Head
	Alloys for Casting High Si (> 12%)		Cylinder Block
Non-ferrous metal	Non-Ferrous Sintered Alloy	DA1000	Bush
	Gunmetal, Carbon		Connecting Rod
	Fe Combined	DA90	Cylinder Block, Bearing Cap

ANXA 16000 R(S)

Expansion

Rake Angle	Radial	+5°
	Axial	+5°

3 mm 90°



Body - ANXA (Aluminum Alloy)

Dimensions (mm)

	Cat. No.	Stock	DC	DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2	No. of Teeth	Weight (kg)
Metric	ANXA 16080RS06	❍	78	80	50	50	27	12,4	7	34	35	14	6	0,5
	16080RS10	●	78	80	50	50	27	12,4	7	34	35	14	10	0,5
	16080RS14	●	78	80	50	50	27	12,4	7	34	35	14	14	0,5
	16100RS08	❍	98	100	50	59	27	12,4	7	34	35	14	8	0,8
	16100RS12	●	98	100	50	50	27	12,4	7	34	35	14	12	0,8
	16100RS18	●	98	100	50	50	27	12,4	7	34	35	14	18	0,9
	16125RS10	❍	123	125	50	50	27	12,4	7	34	35	14	10	1,2
	16125RS14	●	123	125	50	50	27	12,4	7	34	35	14	14	1,2
	16125RS22	●	123	125	50	50	27	12,4	7	34	35	14	22	1,3
	16160RS12	❍	158	160	80	63	40	16,4	9	35	52	29	12	2,6
	16160RS20	❍	158	160	80	63	40	16,4	9	35	52	29	20	2,6
	16160RS28	❍	158	160	80	63	40	16,4	9	35	52	29	28	2,6
Inch	ANXA 16080R06	❍	78	80	50	50	25,4	9,5	6	34	35	14	6	0,5
	16080R10	❍	78	80	50	50	25,4	9,5	6	34	35	14	10	0,5
	16080R14	❍	78	80	50	50	25,4	9,5	6	34	35	14	14	0,5
	16100R08	❍	98	100	50	50	25,4	9,5	6	34	35	14	8	0,8
	16100R12	❍	98	100	50	50	25,4	9,5	6	34	35	14	12	0,9
	16100R18	❍	98	100	50	50	25,4	9,5	6	34	35	14	18	0,9
	16125R10	❍	123	125	50	50	25,4	9,5	6	34	35	14	10	1,2
	16125R14	❍	123	125	50	50	25,4	9,5	6	34	35	14	14	1,2
	16125R22	❍	123	125	50	50	25,4	9,5	6	34	35	14	22	1,3
	16160R12	❍	158	160	80	63	38,1	15,9	10	42,5	55	30	12	2,3
	16160R20	❍	158	160	80	63	38,1	15,9	10	42,5	55	30	20	2,4
	16160R28	❍	158	160	80	63	38,1	15,9	10	42,5	55	30	28	2,6

Blades are sold separately. If using a blade for corner radius machining (ANB1604R/ANB1608R), DC = DCX.
The weight includes the weight of the blade and parts (excluding the centre bolt).
All aluminium alloy bodies with a maximum blade diameter (DCX) of Ø 80 to Ø 125 have the same diameter (DCB) of the retainer hole (metric Ø 27/in Ø 25,4).

Identification Details

ANX	A	16	100	R	S	18
Cutter Series	Aluminum Alloy Body	Blade Size	Cutter Diameter	Feed Direction	Metric	Number of Teeth

● = Euro stock
❍ = Japan stock
❑ = Delivery on request
Recommended Tightening Torque (N·m)

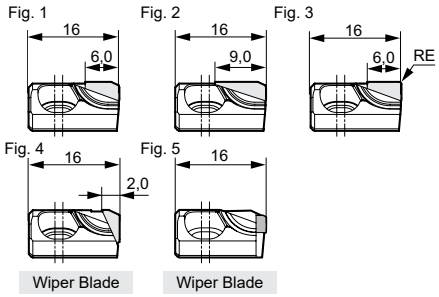
Expansion

Blades

Dimensions (mm)

Application	SUMIDIA		CVD
High Speed / Light Cut	N	K N	N
General Purpose	N	K N	
Roughing	N	K N	

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	RE	Wiper Edge Shape	Applications	Fig.
ANB 1600R-L	●		–	6,0	–	Linear	Low Cutting Force	1
1600R-G	●		–	6,0	–	Arc-Shaped	General Purpose	1
1600R-GB		●	–	6,0	–	Arc-Shaped	Combined Milling*	1
1600R-H	●	–	–	6,0	–	Arc-Shaped	Strong Edge	1
1600R-GX	❍		–	9,0	–	Arc-Shaped	Long Edge	2
1604R	❍		–	6,0	0,4	Linear	Corner Radius	3
1608R	❍		–	6,0	0,8	Linear	Corner Radius	3
1600R-W	❍		–	2,0	–	Arc-Shaped	Wiper	4
1600R-WS	–	–	❒	–	–	Arc-Shaped	Wiper	5



* Cast Iron/Aluminum Alloy

Recommended Cutting Conditions

Si content ≤ 12,6 %

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
N	Aluminum Alloy	–	2.000–**2.500**–3.000	0,05–**0,13**–0,20	DA1000

Si content > 12,6 %

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
N	Aluminum Alloy	–	400–**600**–800	0,05–**0,13**–0,20	DA1000 DA90

Combined Milling of Cast Iron/Aluminum Alloy

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
K N	Cast Iron/ Aluminum Alloy	–	300–**400**–500	0,05–**0,13**–0,20	DA90

The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine rigidity, work clamp rigidity, depth of cut and other factors.

Max. Allowable Spindle Speed

Cat. No.	n max (min^{-1})
ANXA 16080RS06	20.000
16080RS10	20.000
16080RS14	20.000
16100RS08	18.000
16100RS12	18.000
16100RS18	18.000
16125RS10	16.000
16125RS14	16.000
16125RS22	16.000
16160RS12	14.000
16160RS20	14.000
16160RS28	14.000
ANXA 16080R06	20.000
16080R10	20.000
16080R14	20.000
16100R08	18.000
16100R12	18.000
16100R18	18.000
16125R10	16.000
16125R14	16.000
16125R22	16.000
16160R12	14.000
16160R20	14.000
16160R28	14.000

Spare Parts

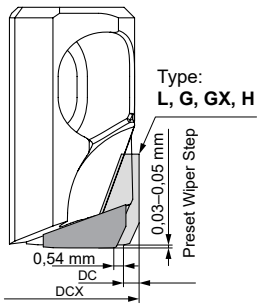
Sold separately.

Applicable Cutters	Clamp Screw		Adjustment Screw	Wrench	Adjustment Wrench	Centre Bolt		Assembly Wrench
ANXA 16080R(S)_ _ 16100R(S)_ _ 16125R(S)_ _ 16160R(S)_ _	BXA0310IP	2,0	HFJ	TRXW10IP	ANT	BXH1235-D33	50	HFVT
						BXH2036-D50	200	

The adjustment spanner (ANT) can also be used for height adjustment of the RF type cutters for high speed machining and the HF type cutters for high efficiency machining.

Wiper Blade Step Amount

When using the wiper blade, in order to maintain balance, be sure to use a cutter with an even number of cutting edges and place the wiper blades at opposite positions.



Milling Cutters

ANXS 16000 R(S)

Expansion

Rake Angle	Radial	+5°
	Axial	+5°

3 mm 90°

Fig. 1

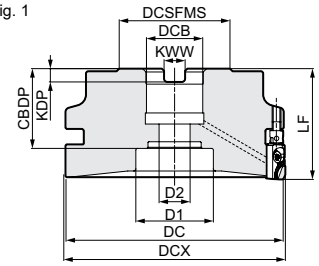
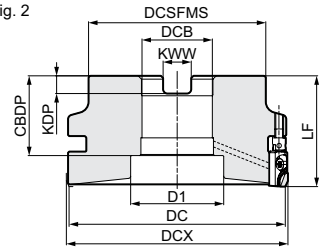


Fig. 2



Body - ANXS (Steel)

Dimensions (mm)

	Cat. No.	Stock	DC	DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP	D1	D2	No. of Teeth	Weight (kg)	Fig.
Metric	ANXS 16040RS04	❍	38	40	38,5	40	16	8,4	5,6	26	14	9	4	0,3	1
	16040RS06	●	38	40	38,5	40	16	8,4	5,6	26	14	9	6	0,3	1
	16050RS04	❍	48	50	48,5	40	22	10,4	6,3	26	18	11	4	0,4	1
	16050RS06	●	48	50	48,5	40	22	10,4	6,3	26	18	11	6	0,4	1
	16050RS09	❍	48	50	48,5	40	22	10,4	6,3	26	18	11	9	0,5	1
	16063RS06	❍	61	63	50	40	22	10,4	6,3	26	18	11	6	0,7	1
	16063RS08	●	61	63	50	40	22	10,4	6,3	26	18	11	8	0,7	1
	16063RS12	●	61	63	50	40	22	10,4	6,3	26	18	11	12	0,7	1
	16080RS06	❍	78	80	50	40	27	12,4	7	34	35	14	6	1,2	1
	16080RS10	❍	78	80	50	50	27	12,4	7	34	35	14	10	1,2	1
	16080RS14	❍	78	80	50	50	27	12,4	7	34	35	14	14	1,2	1
	16100RS08	❍	98	100	80	50	32	14,4	8	32	46	–	8	1,9	2
	16100RS12	❍	98	100	80	50	32	14,4	8	32	46	–	12	2,0	2
	16100RS18	❍	98	100	80	50	32	14,4	8	32	46	–	18	2,0	2
	16125RS10	❍	123	125	80	63	40	16,4	9	35	52	–	10	3,8	2
	16125RS14	❍	123	125	80	63	40	16,4	9	35	52	–	14	3,9	2
	16125RS22	❍	123	125	80	63	40	16,4	9	35	52	–	22	3,9	2
Inch	ANXS 16063R06	❍	61	63	50	50	25,4	9,5	6	31	20	14	6	0,9	1
	16063R08	❍	61	63	50	50	25,4	9,5	6	31	20	14	8	0,9	1
	16063R12	❍	61	63	50	50	25,4	9,5	6	31	20	14	12	0,9	1
	16080R06	❍	78	80	50	50	25,4	9,5	6	34	35	14	6	1,2	1
	16080R10	❍	78	80	50	50	25,4	9,5	6	34	35	14	10	1,2	1
	16080R14	❍	78	80	50	50	25,4	9,5	6	34	35	14	14	1,2	1
	16100R08	❍	98	100	80	50	31,75	12,7	8	36	42	–	8	1,9	2
	16100R12	❍	98	100	80	50	31,75	12,7	8	36	42	–	12	2,0	2
	16100R18	❍	98	100	80	50	31,75	12,7	8	36	42	–	18	2,0	2
	16125R10	❍	123	125	80	63	38,1	15,9	10	42,5	52	–	10	3,9	2
	16125R14	❍	123	125	80	63	38,1	15,9	10	42,5	52	–	14	3,9	2
	16125R22	❍	123	125	80	63	38,1	15,9	10	42,5	52	–	22	3,9	2

Blades are sold separately. If using a blade for corner radius machining (ANB1604R/ANB1608R), DC = DCX.
The weight includes the weight of the blade and parts (excluding the centre bolt).

Identification Details

ANX	S	16	100	R	S	18
Cutter Series	Steel Body	Blade Size	Cutter Diameter	Feed Direction	Metric	Number of Teeth

● = Euro stock
❍ = Japan stock

❑ = Delivery on request

Recommended Tightening Torque (N·m)

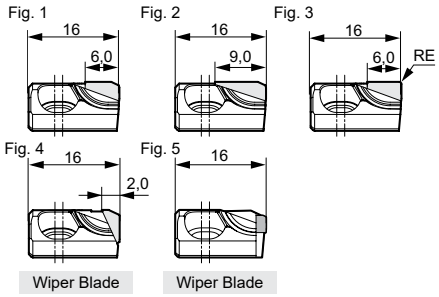
Expansion

Blades

Dimensions (mm)

Application	SUMIDIA		CVD
High Speed / Light Cut	N	K N	N
General Purpose	N	K N	
Roughing	N	K N	

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	RE	Wiper Edge Shape	Applications	Fig.
ANB 1600R-L	●		–	6,0	–	Linear	Low Cutting Force	1
1600R-G	●		–	6,0	–	Arc-Shaped	General Purpose	1
1600R-GB		●	–	6,0	–	Arc-Shaped	Combined Milling*	1
1600R-H	●	–	–	6,0	–	Arc-Shaped	Strong Edge	1
1600R-GX	❍		–	9,0	–	Arc-Shaped	Long Edge	2
1604R	❍		–	6,0	0,4	Linear	Corner Radius	3
1608R	❍		–	6,0	0,8	Linear	Corner Radius	3
1600R-W	❍		–	2,0	–	Arc-Shaped	Wiper	4
1600R-WS	–	–	❒	–	–	Arc-Shaped	Wiper	5



* Cast Iron/Aluminum Alloy

Recommended Cutting Conditions

Si content ≤ 12,6 %

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
N	Aluminum Alloy	–	2.000–**2.500**–3.000	0,05–**0,13**–0,20	DA1000

Si content > 12,6 %

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
N	Aluminum Alloy	–	400–**600**–800	0,05–**0,13**–0,20	DA1000 DA90

Combined Milling of Cast Iron/Aluminum Alloy

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
K N	Cast Iron/ Aluminum Alloy	–	300–**400**–500	0,05–**0,13**–0,20	DA90

The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine rigidity, work clamp rigidity, depth of cut and other factors.

Max. Allowable Spindle Speed

Cat. No.	n max (min^{-1})
ANXS 16040RS04	25.000
16040RS06	25.000
16050RS04	25.000
16050RS06	25.000
16050RS09	25.000
16063RS06	22.000
16063RS08	22.000
16063RS12	22.000
16080RS06	20.000
16080RS10	20.000
16080RS14	20.000
16100RS08	18.000
16100RS12	18.000
16100RS18	18.000
16125RS10	16.000
16125RS14	16.000
16125RS22	16.000
ANXS 16063R06	22.000
16063R08	22.000
16063R12	22.000
16080R06	20.000
16080R10	20.000
16080R14	20.000
16100R08	18.000
16100R12	18.000
16100R18	18.000
16125R10	16.000
16125R14	16.000
16125R22	16.000

Spare Parts

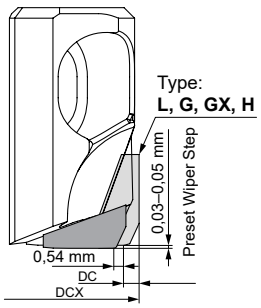
Sold separately.

Applicable Cutters	Clamp Screw		Adjustment Screw	Wrench	Adjustment Wrench	Centre Bolt		Assembly Wrench
ANXS 16040RS_ _	BXA0310IP	2,0	HFJ	TRXW10IP	ANT	BXH0825-D13	15	HFVT
16050RS_ _						BXH1030-D16	25	
16063RS_ _								
16080RS_ _						BXH1235-D33	50	
16100RS_ _						BXH1635-D40	100	
16125RS_ _						BXH2036-D50	200	
16063R_ _	BXA0310IP	2,0	HFJ	TRXW10IP	ANT	BXH1235-D18	40	
16080R_ _						BXH1235-D33	50	
16100R_ _						BXH1635-D40	100	
16125R_ _						BXH2036-D50	200	

The adjustment spanner (ANT) can also be used for height adjustment of the RF type cutters for high speed machining and the HF type cutters for high efficiency machining.

Wiper Blade Step Amount

When using the wiper blade, in order to maintain balance, be sure to use a cutter with an even number of cutting edges and place the wiper blades at opposite positions.



High Speed Finishing of Aluminium Alloy

Fig. 1

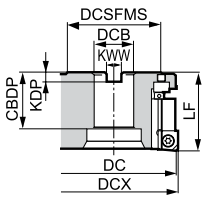
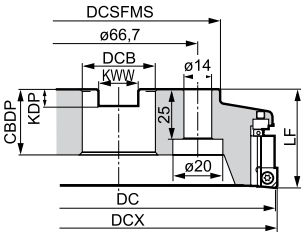


Fig. 2



■ Body

Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Max. Depth of Cut	Weight (Kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP				
RF 4080 RS	●	80	82	60	50	27	12,4	7,0	29	6	3,0	0,7	1
RF 4100 RS	❑	100	102	75	50	32	14,4	8,5	29	6		1,0	1
4125 RS	●	125	127	75	63	40	16,4	9,5	29	8		1,6	1
4160 RS	❑	160	162	100	63	40	16,4	9,5	29	10		2,6	2

Remark: PCD blades and inserts are not included.

■ Insert for Roughing and Finishing

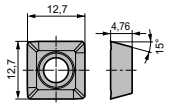


Fig. 1

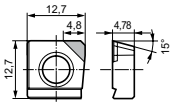


Fig. 2

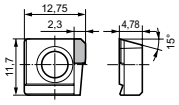
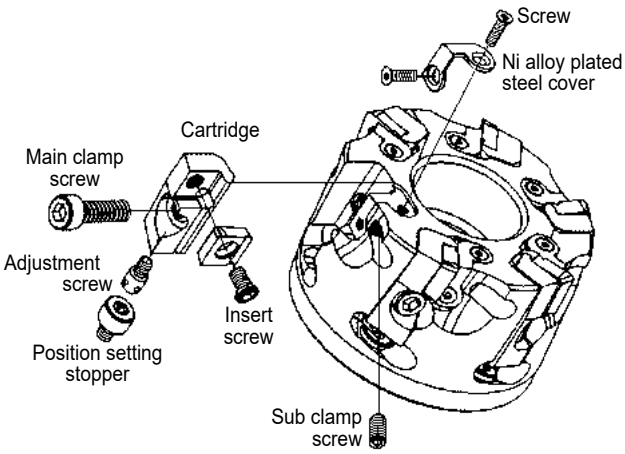


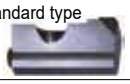
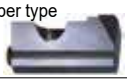
Fig. 3

Application	Carbide	SUMIDIA		
High Speed / Light cut	N	N	N	
General Purpose	N	N	N	
Roughing	N	N	N	
Cat. No.	**H1**	**DA1000**	**DA2200**	**Fig.**
SDET 1204 ZDFR	●			1
SNEW 1204 ADFR-NF		●	▲	2
SNEW 1204 ADFR-W-NF		❍	▲	3

■ Structure



■ "Sumidia" Blade

PCD grade DA2200	Cat. No.	Stock
Standard type 	**RFB**	❑
Wiper type 	**RFBW**	❑

■ Dummy Blade

	RFD	❍

■ Cartridge

Shape	Cat. No.	Stock
For carbide insert	**RFR**	●
For Sumidia insert	**RFF**	●

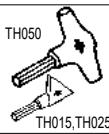
■ Cutting Insert Selection

For easy assembling:
PCD blade **RFB**
PCD blade **RFB** (wiper type)

For finishing:
Cartridge **RFF**
PCD insert SNEW 1204 ADFR-NF (standard type)
SNEW 1204 ADFR-W-NF (wiper type)
PCD grade: DA1000

For roughing:
Cartridge **RFR**
Uncoated carbide insert
SDET 1204 ZDFR, grade: H1

■ Spare Parts

		10,0 N·m	3,0 N·m			6,0 N·m		
Cover	Position setting stoper	Main clamp screw	Sub clamp screw	Cover clamp screw	Adjustment screw	Insert clamp screw	Insert wrench	Cartridge wrench
RFC	RFS	BX0620	BTD0510	FBUP2-A0-8	RFJ	BFTX0509N	TH015, TH025 TH050	TTX20

■ Setting Gauge

RF-SET

Dial-gauge is not included.

● = Euro stock
❍ = Japan stock
❑ = Delivery on request
▲ = To be replaced by new item

High Speed Finishing of Aluminium Alloy

Fig. 1

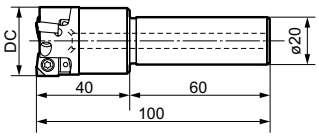
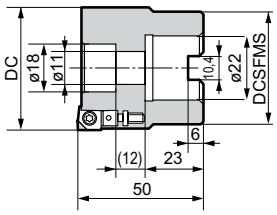


Fig. 2



■ Body

Cat. No.	Stock	Dimensions (mm) DC	Dimensions (mm) DCSFMS	No. of teeth	Fig.	Weight (Kg)
SRF 30 R-ST	❍	30	-	3	1	0,34
SRF 40 R-ST	❍	40	-	4	1	0,50
SRF 50 RS	❑	50	46,5	5	2	0,59
SRF 63 RS	❑	63	45,0	6	2	0,67

Inserts are sold seperately.

■ Inserts

Dimensions (mm)

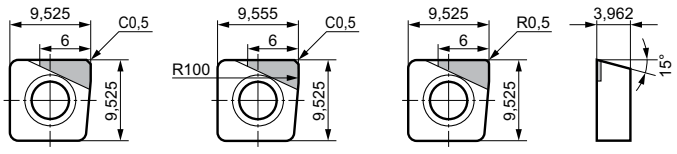


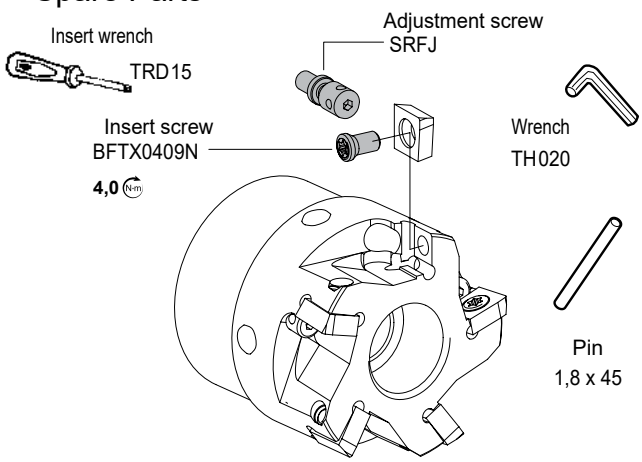
Fig. 1 Fig. 2 Fig. 3

Application	SUMIDIA
High Speed / Light cut	N
General Purpose	N
Roughing	N

Cat. No.	DA1000	Cutting Edge	Fig.
SNEW 09T3 ADTR-NF	❑	Standard	1
09T3 ADTR-U-NF	❑	Wiper	2
09T3 ADTR-R-NF	❍	Nose Radius	3

- Standard inserts and Wiper inserts can be used on the same cutter body.
- Standard inserts with nose radius should be used where vibration is present. As such, Wiper-inserts will not be appliccable.
- Inserts can be regrind 3 times (up to minimum IC diameter 9,225 mm).
- When using reground inserts, it is advisable to reconfirm insert height and cutting diameter with a tool pre-setter.
- Do not mix new and reground inserts, or even inserts with different regrind amount on the same cutter.

■ Spare Parts



■ Maximum D.O.C. Guide (SRF50RS, 5 teeth)

The contains guidelines on the maximum D.O.C., determined from internal tests. "O" mark indicates the possible application range. Actual cutting conditions should be set, based on actual machine and work characteristics.

Feed / D.O.C. (mm)	Feed Speed, v_f (mm/min) 2.500	4.000	5.000
	Feed Rate, f_z (mm/tooth) 0,05	0,08	0,10
0,5	○	○	○
1,0	○	○	○
1,5	○	○	○
2,0	○	○	○
2,5	○	○	○
3,0	○	○	○
3,5	○	○	–
4,0	○	–	–
4,5	○	–	–
5,0	○	–	–

● Cutting Conditions

Cutter: SRF 50 RS
Insert: SNEW 09T3 ADFR-NF (DA1000)
n : 10.000 rpm
Width: 35mm at D.O.C. indicated above

■ Recommended Cutting Conditions for RF and SRF Type Cutters

Work Material		Process	Grade	Cutting Speed (m/min) RF Type	Cutting Speed (m/min) SRF Type	Feed Rate (mm/tooth)	Depth of Cut (mm) RF Type	Depth of Cut (mm) SRF Type
Aluminium Alloy	Si < 13 %	Finishing	**DA1000** (PCD)	2.000–5.000	–4.000	0,05–0,2	–3,0	–5,0
		Roughing	H1 (Carbide)	1.000–2.500	–			
	Si ≥ 13 %	Finishing	**DA1000** (PCD)	400–800	–800			
		Roughing	H1 (Carbide)	200–400	–			

High Speed Finishing of Grey Cast Iron

■ Features

- High speed machining v_c=1.500m/min
- Excellent surface roughness Rz = 3,2 (Ra = 1,0)
- Safety structure for the centrifugal force under high speed cutting conditions
- Run-out is less than 10 µm
- Easy assembling method using the setting gauge
- Running cost is reduced because of economical insert

SUMIBORON ”BN Finish Mill”

■ Application

GG25–GG30 (HB200–250) grey cast iron with pearlite matrix, and ferrite matrix (HB130–160)
Application examples: engine block, cylinder block, etc

■ Specifications

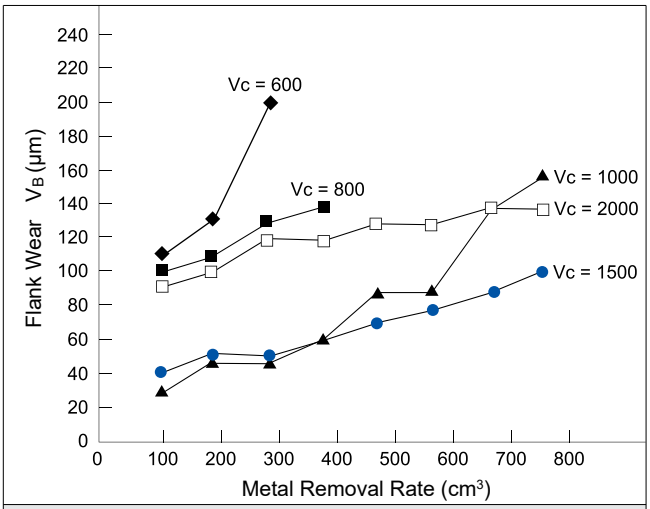
FMU Type:	ø80–ø315 mm
Insert:	SNEW1203ADTR/L
Low cutting force type:	SNEW1203ADTR/L-S

■ Recommended Cutting Conditions

Speed: v_c = 800–2000 m/min
Feed: f_z = 0,1–0,3 mm/tooth
Depth: a_p = 0,5 mm or less
Dry cutting

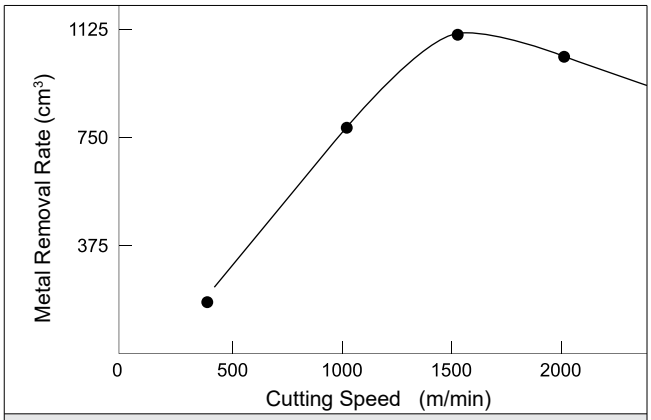
■ Performance

● Tool Life Diagram



Work Material : GG25 H_B 240 (Pearlite)
Cutting Speed : v_c = 600–4000 m/min
Feed Rate : f_z = 0,15 mm/tooth
Depth of Cut : a_p = 0,5 mm, Dry

● Estimated Tool Life



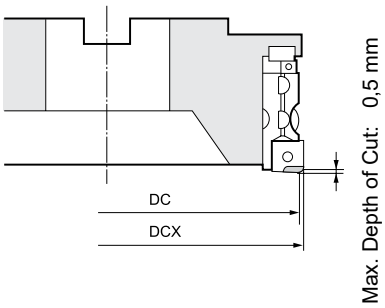
Work Material : GG25 H_B 240 (Pearlite)
Cutting Speed : v_c = 400–4000 m/min
Feed Rate : f_z = 0,15 mm/tooth
Depth of Cut : a_p = 0,5 mm, Dry

- Milling of ductile cast iron and alloy steel casting do not produce the best results.
- Dry cutting is recommended. Wet cutting will result in chipping of cutting edges in the early stages due to thermal cracking.

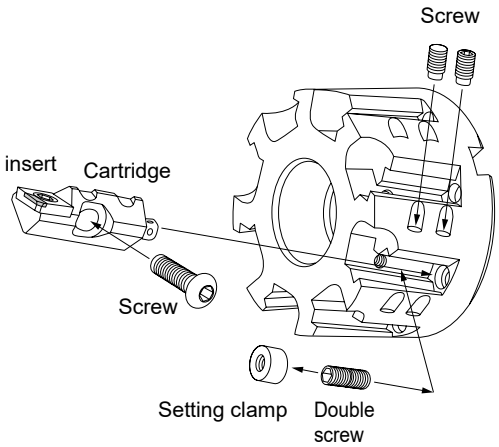
● = Euro stock
❍ = Japan stock
❑ = Delivery on request
▲ = To be replaced by new item
Recommended Tightening Torque (N·m)

Specifications

Approach angle: 90°
Axial rake angle: + 8°
Radial rake angle: + 2°



Structure



Body

Fig. 1

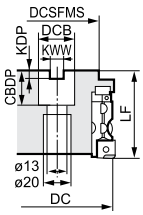


Fig. 2

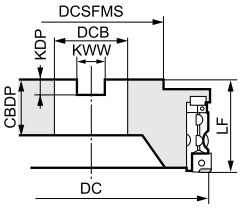


Fig. 3

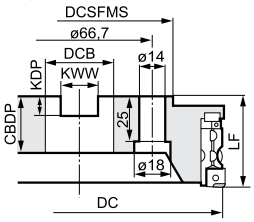


Fig. 4

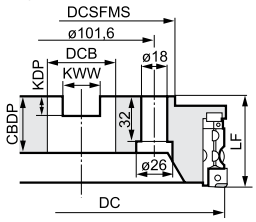
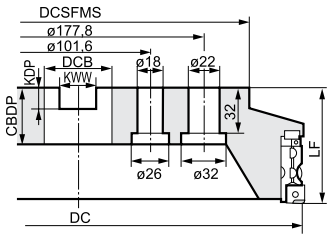


Fig. 5



Cat. No.	Stock	Dimensions (mm)								No. of Teeth	Max. Depth of Cut	Weight (Kg)	Fig.
		DC	DCX	DCSFMS	LF	DCB	KWW	KDP	CBDP				
FMU 4080 RS	❑	80	82,8	60	63	27	12,4	7,0	25	6	0,5	1,6	1
FMU 4100 RS	●	100	102,8	76	63	32	14,4	8,5	29	8		2,4	2
4125 RS	❑	125	127,8	75	63	40	16,4	9,5	29	10		3,4	2
4160 RS	❑	160	162,8	100	63	40	16,4	9,5	29	12		5,6	3
FMU 4200 RS	❑	200	202,8	130	63	60	25,7	14,0	38	16		9,2	4
4250 RS	❑	250	252,8	130	63	60	25,7	14,0	38	20		14,3	4
FMU 4315 RS		315	317,8	240	80	60	25,7	14,0	40	24		27,8	5

Inserts

Fig. 1

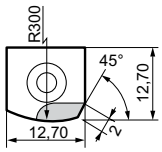
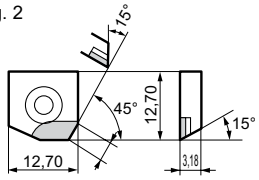


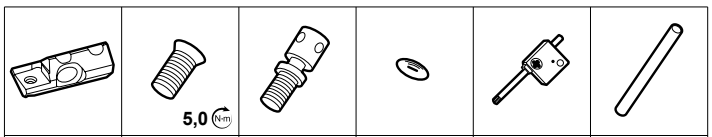
Fig. 2



Application	CBN	
High Speed / Light cut	K	K
General Purpose	K	K
Roughing		

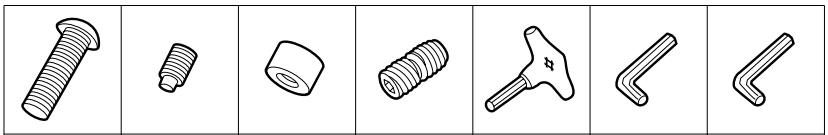
Cat. No.	BN700	BN7000	Figure
SNEW 1203 ADT R	▲	❍	1
1203 ADT R-S	▲	❍	2

Cartridge



Cartridge	Insert Screw	Adjustment Screw	O-ring	Insert Wrench	Pin
FMUU	BFTX0509N	FMUJ	P3	TRX20	1,8 x 45

Spare Parts



Cartridge Screw	Screw	Setting clamp	Double screw	Wrench	Wrench	Wrench
BH0620	BTD0609	FMUE	WB5-10	TH040	LH030	LH025

Gauge

RF-SET

Dial-gauge is not included.

Indexable Endmills

H1–H88

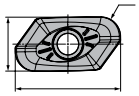
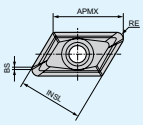
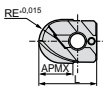
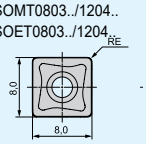
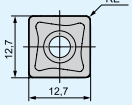
H

	Selection Guide	Milling Cutter Selection Guide	H2–3
	Exchangeable Head Endmills	According to Work Materials / Applications	
		Modular Tools	H4–5
Face Milling	”Sumi Dual", General Purpose Face Mills Expansion	DGC 13000 EW	H6
	”Wave Mill", General Purpose Face Mills Expansion	WGX 13000 EW	H7
	"Sumi Dual", High Feed Milling	DMSW 08000 E(L)	H8
		DMSW 08000 M	H9
	High Feed Milling	MSX 06000/08000/12000/14000 ES/EM/EW	H10–11
		MSX 06000/08000/12000/12000 M	H12–13
	High Feed Milling Expansion	WFXH 08000/12000 M	H14–15
Shoulder Milling	”Sumi Dual Mill” Expansion	DFC(M) 09000 E	H16–17
	”Wave Mill” for Shoulder Milling Expansion	WFX(F/M) 08000/12000 E	H18–19
		WFX 08000 M	H18
	”Sumi Dual Mill”, tangential Expansion	TSX(F/M) 08000/13000 E	H20–23
	”Sumi Dual Mill”, Repeater Mill	TSXR 08000/13000 E New	H24–25
	”Sumi Wave” for Shoulder Milling Expansion	WEZ	H26–29
		WEZ 11000 E/ES/EL	H30–35
		WEZ 17000 E/ES/EL	H36–41
	"Wave Mill", Repeater Mill	WEZR 11000/17000 E New	H42–45
		WEZ 11000/17000 M	H46–49
		WEZR 11000/17000 M New	H50–53
	"Wave Mill" for Shoulder Milling	WEX 1000/2000/3000 E/EL/EW/M	H54–60
	”Wave Mill” Series for Aluminium	WAX 3000 E/EL	H61–62
		WAX 4000 E/EL	H63
	Repeater Mill	WRX 2000 / 3000	H64–67
	Shoulder Milling Cutter for Titanium	MTIX 16000 New	H68–69
Others	”Wave Ball-Mill” for Roughing	WBMR 2000/2000L	H70–71
	”Wave Ball-Mill” for Finishing	WBMF 1000	H72–73
	”Wave Radius Mill” with Polygon Inserts	WRCX 08000/10000 E	H74
		08000/10000/12000 M	H75
	”Wave Radius Mill” with Round Inserts	RSX(F) 08000/10000/12000 ES	H76
		08000/10000/12000 M	H77
	”Wave Mill” for Chamfering Expansion	WFXC 08000/12000 E	H78–79
		WFXC 08000/12000 M	H80
	High Speed Non-Ferrous Mill Expansion	ANX	H82–83
		ANXS 16000 E	H84–85
		ANXS 16000 M New	H86–87

Selection Guide

Application	Cutter Type	Series	Insert Type	Approach Angle / Max. Depth of Cut (mm)	Cutter Diameter (mm)	Application: Face Milling: General Purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile Finishing	Work Material: P: Carbon Steel / Alloy Steel	P: Tempered Steel / Die Steel	M: Stainless Steel	K: Cast Iron / Ductile Cast Iron	N: Non-Ferrous Metal	N: Aluminium Alloy	S: Ti Alloy / Heat Resistant Alloy	H: Hardened Steel HRC 45–55	Ref. Page
Face Milling	DGC	DGC 13000-EW	SNMU13T6..ONMU05T6..	3–6 mm 45°	40–63	◎										◎	◎	◎	◎	◎	◎	○		H6
Face Milling	WGX	WGX 13000-EW	SEE/MT 13T3..	6 mm 45°	32–63	◎	◎									◎	◎	◎	◎	◎	◎	◎		H7
High Feed Milling	DMSW New	DMSW 08000-E(L)	WNMU0807...	3 mm 15°	35–63			◎	○	○	○					◎	◎	◎	◎				○	H8
High Feed Milling	DMSW-M New	DMSW 08000-M		3 mm 15°	35–42			◎	○	○	○					◎	◎	○	◎				○	H9
High Feed Milling	MSX	MSX(ES/EM/EW) 06000, 0800, 12000, 14000	WDMT0603.., WDMT0804.. WDMT1205.., WDMT1406..	1,0–2,5 mm 20°	16–63			◎	○	○	○					◎	◎	◎	◎				○	H11
High Feed Milling	MSX-M	MSX 06000-M 08000-M 12000-M		1,0–2,0 mm 20°	16–40			◎	○	○	○					◎	◎	◎	◎				○	H12
High Feed Milling	WFXH-M	WFXH 08000-M	SOMT 1204..	1,5 mm 15°	25–32			◎	○	○	○					◎	◎	◎	◎			○	○	H15
High Feed Milling		WFXH 12000-M		2,5 mm 15°	40																			
Shoulder Milling	DFC	DFC (M) 09000-E	XNMU 0606..	6 mm 90°	25–80	◎	○		◎	○						◎	◎	○	◎			○		H17
Shoulder Milling	WFX	WFX(M/F) 08000-E 12000-E	SOMT 0803..	6 mm 90°	20–63	○	◎		◎	○						◎	◎	◎	◎	◎	◎	○		H18
Shoulder Milling				10 mm 90°	40–80																			H19
Shoulder Milling	WFX-M	WFX 08000-M	SOMT 1204..	6 mm 90°	20–40																			H18
Shoulder Milling	TSX	TSX (-F) 08000-E TSX (-M) 13000-E	LNEX 0804..	8 mm 90°	16–80	◎	◎		◎	○						◎	◎	◎	◎			◎		H22
Shoulder Milling				12 mm 90°	25–80																			H23
Shoulder Milling	TSXR New	TSXR 08000-E 13000-E	LNEX1306..	21–40mm 90°	20–40	○			◎							◎	◎	◎	◎			◎		H24
Shoulder Milling				41–60mm 90°	40–50																			H25
Shoulder Milling	WEZ	WEZ 11000 -E/ES/EL	AOMT 11T3..., AOET11T3..., AOMT 1705..., AOET1705...	10 mm 90°	14–80	◎	◎		◎	◎	◎			○		◎	◎	◎	◎	◎	◎	◎		H30 H32 H34
Shoulder Milling		WEZ 17000 -E/ES/EL		15 mm 90°	25–80																			H36 H38 H40
Shoulder Milling	WEZR -E -M New	WEZR 11000-E, 17000-E		19–84mm 90°	20–40, 40–50	◎	◎		◎	◎	◎			○		◎	◎	◎	◎	◎	◎	◎		H42 H44
Shoulder Milling		WEZR 11000-M, 17000-M		27–29mm 90°	32, 40																			H50 H52
Shoulder Milling	WEX	WEX 1000-E/EL	AXMT0602.., AXMT1235.., AXMT1705..	5 mm 90°	10–25	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎		H56
Shoulder Milling		WEX 2000-E/EL		10 mm 90°	14–63																			H57
Shoulder Milling		WEX 3000-E/EL		14 mm 90°	25–63																			H58
Shoulder Milling	WEX-M	WEX 2000-M		10 mm 90°	16–40	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎		H57
Shoulder Milling		WEX 3000-M		14 mm 90°	25–40																			H58
Shoulder Milling	WRX	WRX 2000-E/W	AXMT1235.. , AXMT1705..	18–36mm 90°	20–40	○			◎	◎	○					◎	◎	◎	◎	◎	◎	◎		H65
Shoulder Milling		WRX 3000-E/W		27–53mm 90°	32–50																			H66

◎ : Preferred choice
○ : Suitable

Application	Cutter Type	Series	Insert Type	Approach Angle / Max. Depth of Cut (mm)	Cutter Diameter (mm)	Face Milling: General Purpose	Face Milling: Finishing	Face Milling: High Feed	Shoulder Milling	Groove Milling	Ramping	Chamfering	Drilling	Profiling	Profile Finishing	P: Carbon Steel / Alloy Steel	P: Tempered Steel / Die Steel	M: Stainless Steel	K: Cast Iron / Ductile Cast Iron	N: Non-Ferrous Metal	N: Aluminium Alloy	S: Ti Alloy / Heat Resistant Alloy	H: Hardened Steel HRC 45–55	Ref. Page
Shoulder M.	MTIX New	MTIX 16000	XOMT1605.. 	13 mm 90°	32	◎	◎		◎	◎	◎							○				◎		H69
Multi-Purpose	WRCX	WRCX 08000-E 10000-E	QPMT 0803../10T3../1204.. QPET 10T35../1204..	4–5 mm	12–32	○		○	○	○	◎			◎		◎	◎	◎	◎	◎	◎			H74
	WRCX-M	WRCX 08000-M 12000-M		4–6 mm	20–40	○		○	○	○	◎			◎		◎	◎	◎	◎	◎	◎			H75
	RSX	RSX(F) 08000-ES 10000-ES 12000-ES	RDET0803..RDET10T3.. RDET1204..	4 mm 5 mm 6 mm	20–32(ES) 40(M)	○		○	○	○	◎			◎		◎	◎	◎	◎			◎		H76 H77
	RSX-M	RSX(F) 08000-M 10000-M 12000-M																						
Alumimium	WAX	WAX 3000-E/EL	AECT1604.., AECT2206.. 	16–18 mm 90°	20–40	○			◎	◎	◎			◎						○	◎			H62 H63
		WAX 4000-E/EL		22–24 mm 90°	25–40																			
3D Profiling	WBMR	WBMR 2000	ZNMT 1804100-C 2004100-S	20–47 mm	R10 (20)–R25 (50)					◎				◎		◎	◎	◎	◎					H71
		WBMR 2000-L		30–69 mm																				
	WBMF	WBMF 1000	ZPGU 1551050 	0,1–0,4 mm	R5 (10)–R15 (30)					◎				◎	◎	◎	◎							H73
Chamfering	WFXC-E	WFXC 08000-E	SOMT0803../1204.. SOET0803../1204.. 	45°	08–16							◎				◎	◎	◎	◎	◎	◎	○		H79
		WFXC 12000-E			25–32																			
	WFXC-M	WFXC 08000-M		45°	16							◎				◎	◎	◎	◎	◎	◎	○		H80
		WFXC 12000-M			25–32																			
High Speed Non-Ferrous Milling	ANX	ANXS 16000-E	ANB 1600R-L	3 mm 90°	32–40	○	◎	◎	◎	○										◎	◎			H84
	ANXS-M New	ANXS 16000-E	ANB 1600...	3 mm 90°	23–38	○	◎	◎	◎	○										◎	◎			H86

Modular Tools

General Features

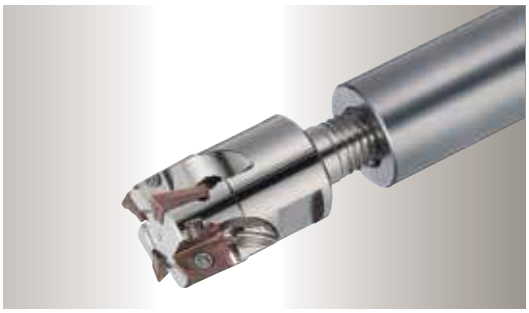
Indexable head endmills are available in 10 types:

WEZ	**MSX**
WEX	**RSX**
WFX	**WRXC**
DMSW	**WFXC**
WFXH	**ANXS**

In addition to carbide arbors and steel arbors, the lineup of integrated BBT types enables a variety of combinations.

General-purpose grade applicable to any work material. Introducing the new grade ACU2500, which is applicable to a wide variety of processes and work materials such as steel, stainless steel and cast iron.

Suitable for milling with **long overhangs** when combined with carbide or steel arbors!

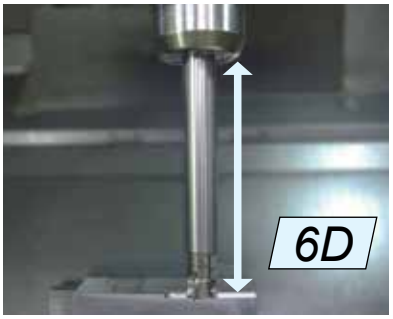


Easy to change screw-on endmill type WEX and carbide arbor

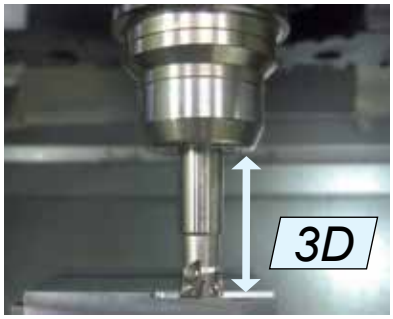
When combined with BBT integrated arbors, **high load milling** is supported.

RSX type + BBT30 integrated arbor

Modular Head + Carbide Arbor



Standard Shank Type Endmill



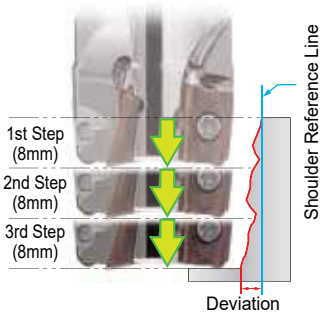
Note: Cutting conditions can vary according to cutter reach, rigidity of machine tool / workpiece etc.

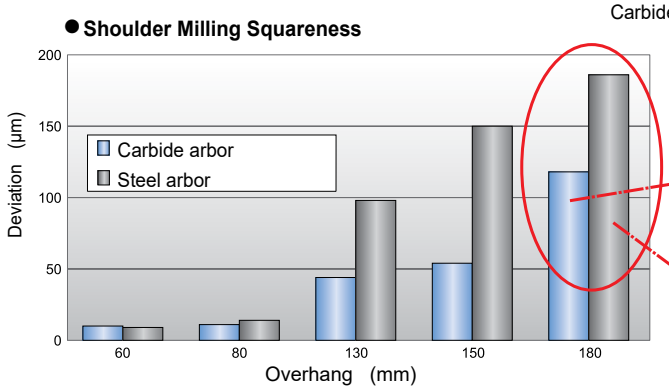
Screw Size and Mounting Cutter Size

Screw CRKS	Applicable Cutter Size (DC)
M8	Ø 16, Ø 18
M10	Ø 20, Ø 22
M12	Ø 24, Ø 28
M16	Ø 30, Ø 32, Ø 35, Ø 40

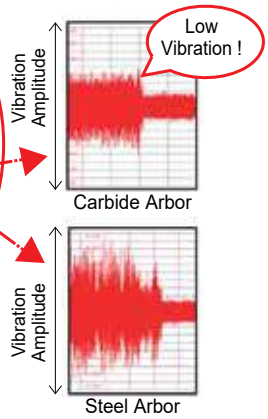
Performance

● A Carbide Arbor improves feed rates, surface finish, sizing, and tool life.





Carbide Arbor Comparison ...

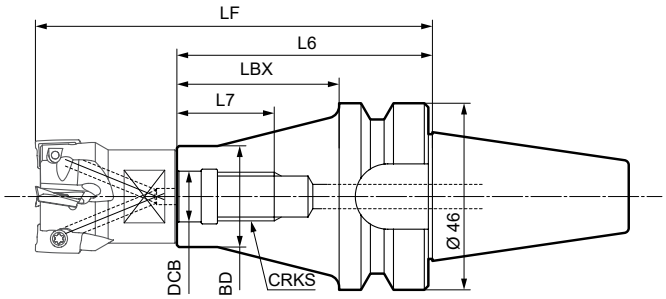


Work Material	:	C50
Tool	:	WEX2025M12Z4 (ø D = 25, 4 teeth)
Cutting Conditions:		v_c = 100 m/min, f_z = 0,1 mm/tooth
		a_p = 8 mm x 3 passes, a_e = 2,0 mm, Equipment: M/C BT50

● = Euro stock
○ = Japan stock

Recommended Tightening Torque (N·m)

■ BBT Integrated Type - Modular Tools Special Arbors



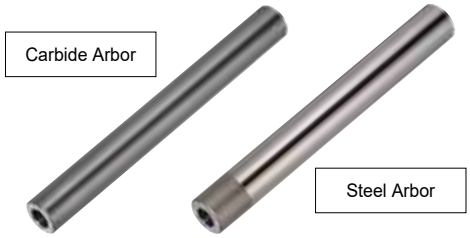
■ BBT Integrated Arbor

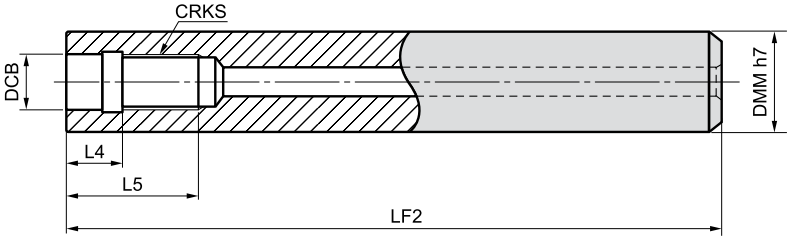
Dimensions (mm)

Cat. No.	Stock	CRKS	DCB	BD	L6	LBX	L7	LF*	Coolant Hole
BBT30- M8-50	❍	M8	8,5	15,9	73	50	18	98	Yes
M10-45	❍	M10	10,5	19,9	68	45	20	98	Yes
M12-40	❍	M12	12,5	24,9	63	40	22	98	Yes
M16-35	❍	M16	17	31,9	58	35	24	98	Yes

* Overhang length for LF is with head mounted. Can also be used with BT30 special machines.

■ Carbide and Steel Arbor





■ Carbide Arbor

Cat. No.	Stock	Dimensions (mm)						
		CRKS	DCB	DMM	LF2	L4	L5	LF*
MA 15 M08 L120C	●	M8	8,5	15	120	10	18	145
15 M08 L160C	●	M8	8,5	15	160	10	18	185
MA 16 M08 L120C	●	M8	8,5	16	120	10	18	145
16 M08 L160C	●	M8	8,5	16	160	10	18	185
MA 18 M10 L150C	●	M10	10,5	18	150	10	20	180
18 M10 L200C	●	M10	10,5	18	200	10	20	230
MA 20 M10 L150C	●	M10	10,5	20	150	10	20	180
20 M10 L200C	❍	M10	10,5	20	200	10	20	230
MA 23 M12 L200C	●	M12	12,5	23	200	10	22	235
23 M12 L250C	●	M12	12,5	23	250	10	22	285
MA 25 M12 L200C	●	M12	12,5	25	200	10	22	235
25 M12 L250C	●	M12	12,5	25	250	10	22	285
MA 28 M16 L200C	●	M16	17,0	28	200	10	24	240
28 M16 L300C	●	M16	17,0	28	300	10	24	340
MA 32 M16 L200C	●	M16	17,0	32	200	10	24	240
32 M16 L300C	●	M16	17,0	32	300	10	24	340

■ Steel Arbor

Cat. No.	Stock	Dimensions (mm)						
		CRKS	DCB	DMM	LF2	L4	L5	LF*
MA 16 M08 L120S	●	M8	8,5	16	120	10	18	145
MA 20 M10 L150S	●	M10	10,5	20	150	10	20	180
MA 25 M12 L200S	●	M12	12,5	25	200	10	22	235
MA 32 M16 L200S	●	M16	17,0	32	200	10	24	240

■ Identification of Catalogue No.

MA 15 M08 L120 C

- MA: Modular Arbor
- 15: Shank Diameter
- M08: Mounting Screw
- L120: Arbor Length
- C: Material (C: Carbide, S: Steel)

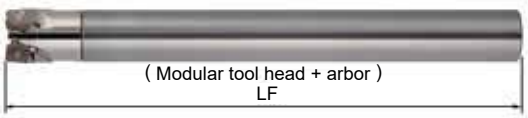
■ Recommended Tightening Torque

Screw	Wrench		(N·m)
	W	S	
M 8	8	13	23
M10	8	15	46
M12	10	19	60
M16	10	24	80

Notes about tightening the head:

- Refer to the Head Cat. No. chart on pages H18, H19, H35 and H37 to select the arbor size in the table above.
- Check the mounting screw size of the head and arbor beforehand.
- When attaching head to an arbor, follow the standard tighting torque in the table above.

●*Modular Tool System



"Sumi Dual Mill" Face Mill
DGC (EW) Type

Expansion

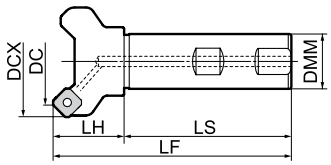
General Milling for Steel and Cast Iron

Rake Angle		
	Radial	-10°
	Axial	-5°

SNMU / SNEU: 6 mm, 45°

ONMU / ONEU: 3 mm, 45°

■ Body – Shank Type



■ Body

Cat. No.	Stock	Dimensions (mm) DC	DCX	DMM	LH	LS	LF	No. of Teeth	Weight (kg)
DGC 13040 EW	●	40 (42,90)	54	32	40 (38,44)	85	125	3	0,7
13050 EW	❍	50 (52,90)	65	32	40 (38,44)	85	125	3	0,9
13063 EW	❍	63 (65,90)	77	32	40 (38,44)	85	125	4	1,1

( ) Figures in brackets indicate values for inserts of type ONMU

■ Identification Details

DGC	13	040	EW
Cutter Series	Insert Size	Cutter Diameter	Endmill Type Weldon

■ Inserts

Dimensions (mm)

Application	Coated Carbide										Cermet	
High Speed/Light cut	K M S	P K M	P			K	K		M S		P M	
General Purpose	K M S	P K M		P M	M	K	K		M S		P	
Roughing	K M S			P M	P M			K		M S		
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	T4500A	Fig.
SNMU 13T6ANER L	●	❍	●	●	●	❍	●	●				1
13T6ANER G	●	❍	●	●	●	❍	●	●				1
13T6ANER H	●	❍	●	●	●	❍	●	●				1
13T6ANER FL	●		●	●	●		●	●				2
13T6ANER FG	●	❍	●	●	●	❍	●	●				2
SNEU 13T6ANER L									●	●		1
13T6ANER G									●	●		1
13T6ANER FL									❍	❍		2
13T6ANER FG									●	●		2
XNEU 13T6ANEN W	●	❍		●		❍		●			●	3
ONMU 05T6ANER L	●		●	●	●		●	●				4
05T6ANER G	●	❍	●	●	●	❍	●	●				4
ONEU 05T6ANER L									●	●		4
05T6ANER G									●	●		4

Fig. 1

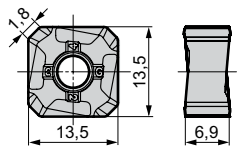


Fig. 2

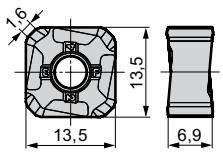


Fig. 3

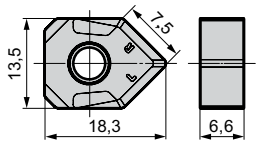
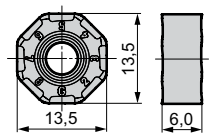
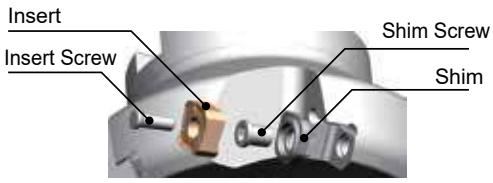


Fig. 4

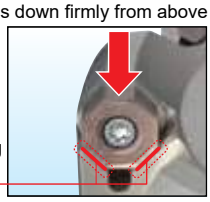




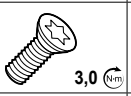
Attaching Octagonal Inserts

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

Press down firmly from above



■ Spare Parts

Shim	Shim Screw	L Seat Wrench	Insert Srew	Insert Wrench
			 3,0	
DGCS 13 R	BW 0609 F	LH 040	BFTX 0412 IP	TRDR 15 IP

Optional

Insert Srew (*)
BFTX 0418 IP

*Corners can be changed simply by loosening the screw. (Only suitable for DGC / DGCM types with body size ≥ Ø 80).

■ SNMU – Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_z (min/t)	Depth of Cut (mm)	Grade
P	General Steel	180–280	150–**200**–250	0,10–**0,25**–0,40	<4	ACU2500 ACP200 ACP300 XCU2500
	Alloyed Steel	≤180	180–**250**–350	0,10–**0,30**–0,45	<4	
	Die Steel	200–220	100–**150**–200	0,15–**0,25**–0,35	<4	
M	Stainless Steel	–	160–**200**–250	0,15–**0,23**–0,30	<3	ACU2500 ACM300
K	Cast Iron	250	100–**200**–250	0,10–**0,25**–0,40	<5	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Steel	–	30–**50**–80	0,10–**0,20**–0,30	<3	ACU2500 ACM200 ACM300

Min. – **Optimum** – Max.

■ ONMU – Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_z (min/t)	Depth of Cut (mm)	Grade
P	General Steel	180–280	150–**200**–250	0,10–**0,30**–0,50	<2	ACU2500 ACP200 ACP300 XCU2500
	Alloyed Steel	≤180	180–**250**–350	0,10–**0,50**–0,50	<2	
	Die Steel	200–220	100–**150**–200	0,15–**0,25**–0,30	<2	
M	Stainless Steel	–	160–**200**–250	0,15–**0,23**–0,30	<2	ACU2500 ACM300
K	Cast Iron	250	100–**200**–250	0,10–**0,30**–0,50	<2	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Steel	–	30–**50**–80	0,10–**0,20**–0,30	<2	ACU2500 ACM200 ACM300

● = Euro stock
○ = Japan stock

→ G6-G9

Recommended Tightening Torque (N·m)

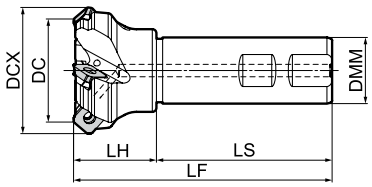
"Sumi Wave" Face Mill
WGX (EW) Type

General Milling for Steel and Cast Iron

Rake Angle	Radial	-20°–24°
	Axial	20°–22°

6 mm 45°

■ Body – Shank Type



■ Body – Dimensions

Cat. No.	Stock	Dimensions (mm)						No. of Teeth
		DC	DCX	DMM	LH	LS	LF	
WGX 13032 EW	❍	32	44	32	40	85	125	3
13040 EW	❍	40	52	32	40	85	125	3
13050 EW	❍	50	62	32	40	85	125	4
13063 EW	❍	63	76	32	40	85	125	5

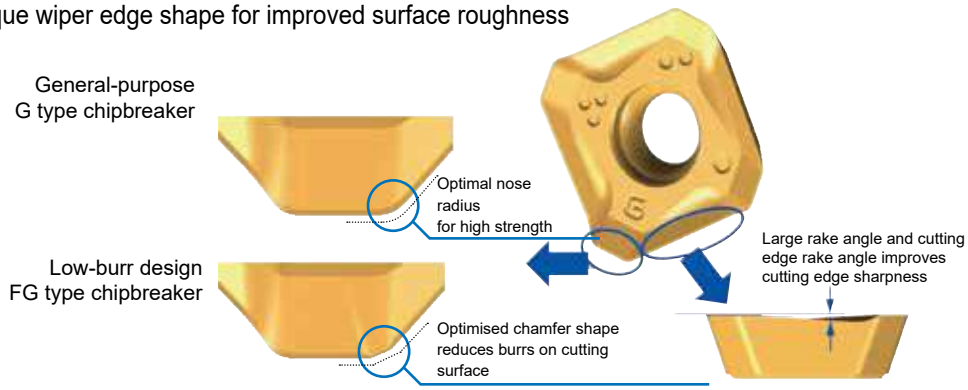
Inserts are not included.
ø 32 mm cutters do not have a seat.

■ Identification Details

WGX	13	032	EW
Cutter Series	Insert Size	Cutter Diameter	Endmill Type Weldon

■ Insert Shape Characteristics

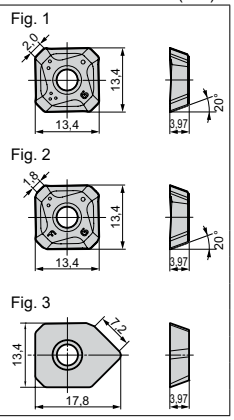
Unique wiper edge shape for improved surface roughness

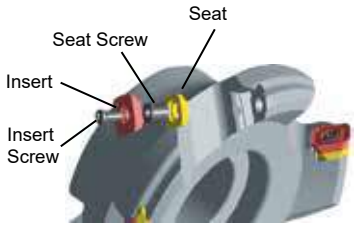


■ Inserts

Application	Coated Carbide										Carb.	DLC	Cermet	
High Speed/Light Cut	K M	P K M	P			K	K		M S		K N	N		
General Purpose	K M	P K M		P M	M	K	K		M S	M S		N	P M	
Roughing	K M			P M	P M			K		M S			P	
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500A	Fig.
SEET 13T3AGFR-L											❍	❍		1
SEET 13T3AGSR-L	●	❍	●	●	●	❍	●	●	●	●			●	1
13T3AGSR-G	●	❍	●	●	●	❍	●	●	●	●			●	1
SEMT 13T3AGSR-L	●	❍	●	●	●	❍	●	●	●	●				1
13T3AGSR-G	●	❍	●	●	●	❍	●	●	●	●				1
13T3AGSR-H	●	❍	●	●	●	❍	●	●	●	●				1
SEMT 13T3AGSR-FG	●	❍	●	●	●	❍	●	●	●	●				2
XEEW 13T3AGER-WR	●	❍		❍		❍		❍					❍	3

Dimensions (mm)





■ Spare Parts

Applicable Cutters	Seat	Seat Screw	Insert Screw	Insesrt Wrench	N·m	Spanner (for Seat)
WGX 130__EW						
øD = 32	–	–	BFTX 03512 IP	TRDR 15 IP	3,0	–
øD = 40–63	WGCS 13 R	BW 0507 F	BFTX 03512 IP	TRDR 15 IP	3,0	LH 035

■ Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/tooth)	Grade
P	General Steel	180–280	150–**200**–250	0,15–**0,20**–0,25	ACU2500 ACP200 XCU2500
	Soft Steel	≤180	180–**265**–350	0,10–**0,25**–0,40	
	Die Steel	200–220	100–**150**–200	0,15–**0,20**–0,25	
M	Stainless Steel	-	160–**205**–250	0,15–**0,23**–0,30	ACU2500 ACM300
K	Cast Iron	250	100–**175** –250	0,15–**0,23**–0,30	ACU2500 ACK200 XCK2000
N	Non Ferrous Alloy	-	500–**750**–1000	0,15–**0,23**–0,30	DL1000
S	Exotic Alloy	-	30 – **50**– 80	0,10–**0,20**–0,30	ACU2500 ACM300

Minimum-**Optimum**-Maximum

→ G10/G11

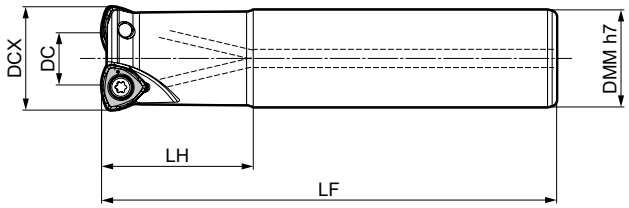
"Sumi Dual Mill"
DMSW 08000 E(L)

New

Rake angle	Radial	-7° to -10°
	Axial	-6°

3 mm 15°

Fig 1



Body (Shank Type)

Dimensions (mm)

Cat. No.	Stock	DCX	DC	DMM	LH	LF	Number of teeth	Weight (kg)	Fig.
DMSW 08035E02	●	35	18,6	32	50	150	2	0,85	1
08040E03	●	40	23,5	32	50	150	3	0,86	1
08050E03-42	●	50	33,4	42	50	150	3	1,51	1

Inserts are sold seperately.

Body (Long Shank Type)

Dimensions (mm)

Cat. No.	Stock	DCX	DC	DMM	LH	LF	Number of teeth	Weight (kg)	Fig.
DMSW 08035EL02	●	35	18,6	32	60	210	2	1,21	1
08040EL03	●	40	23,5	32	60	210	3	1,22	1
08050EL03-42	●	50	33,4	42	50	250	3	2,54	1

Inserts are sold seperately.

Parts

Insert screw		Wrench
	N·m	
BFTX0513IP	5,0	TRDR20IP

Identification Details

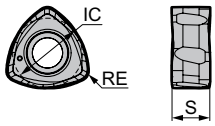
DMSW	08	050	E	L	03	-	42
Cutter series	Insert size	Cutter diameter	Shank	Long shank type	Number of teeth		Shank diameter

Inserts

Dimensions (mm)

Application	Coated carbide								
High speed / light cut		P		K					
General purpose	K P M S	P	P	K	K				
Roughing	K P M S		P		K				
Cat. No.	ACU2500	ACP2000	ACP3000	ACK2000	ACK3000	IC	S	RE	Fig.
WNMU 0807ZNER-G	●	●	●	●	●	13	7	1,6	1
WNMU 0807ZNER-H	●	●	●			13	7	1,6	1

Fig 1



Recommended Cutting Conditions

min.–optimum–max.

ISO	Work material	Hardness	Cutting speed v_c (m/min)	Feed rate f_z (mm/t)
P	General steel	< 280 HB	100–160–250	1,0–1,5–2,0
	Alloy steel	< 280 HB	100–160–200	1,0–1,5–1,8
	Alloy steel	< 42 HRC	100–150–180	0,8–1,0–1,2
M	Stainless steel	–	80–120–150	0,8–1,0–1,2
K	Cast iron	–	100–160–250	1,0–1,5–1,8
H	Hardened steel	< 52 HRC	80–100–120	0,3–0,5–0,7

The above figures are guidelines for use with BT50 machine tools at depth of cut (a_p) of 1,5 mm.
The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.

● = Euro stock
❍ = Japan stock

→G63-G66

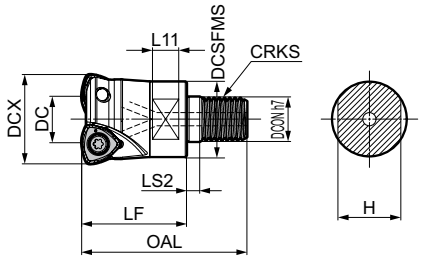
DMSW 08000 M

Modular Type

Rake angle	Radial	-11° to -13°
	Axial	-6°

3 mm 15°

Fig 1



Head

Dimensions (mm)

Cat. No.	Stock	DCX	DC	DCSFMS	DCON	CRKS	OAL	LF	LS2	L11	H	Number of teeth	Weight (kg)	Fig.
DMSW 08035M16Z2	●	35	18,6	28,5	17	M16	63	40	5	10	24	2	0,19	1
08040M16Z3	●	40	23,5	28,5	17	M16	63	40	5	10	24	3	0,21	1

Inserts are sold seperately.

Parts

Insert screw		Wrench
	N·m	
BFTX0513IP	5,0	TRDR20IP

Identification Details

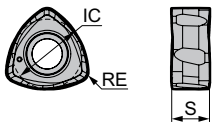
DMSW	08	040	M16	Z3
Cutter series	Insert size	Cutter diameter	Mounting screw size	Number of teeth

Inserts

Dimensions (mm)

Application	Coated carbide								
High speed / light cut		P		K					
General purpose	K P M S	P	P	K	K				
Roughing	K P M S		P		K				
Cat. No.	ACU2500	ACP2000	ACP3000	ACK2000	ACK3000	IC	S	RE	Fig.
WNMU 0807ZNER-G	●	●	●	●	●	13	7	1,6	1
WNMU 0807ZNER-H	●	●	●			13	7	1,6	1

Fig 1



Recommended Cutting Conditions

min.–optimum–max.

ISO	Work material	Hardness	Cutting speed v_c (m/min)	Feed rate f_z (mm/t)
P	General steel	< 280 HB	100–160–250	1,0–1,5–2,0
	Alloy steel	< 280 HB	100–160–200	1,0–1,5–1,8
	Alloy steel	< 42 HRC	100–150–180	0,8–1,0–1,2
M	Stainless steel	–	80–120–150	0,8–1,0–1,2
K	Cast iron	–	100–160–250	1,0–1,5–1,8
H	Hardened steel	< 52 HRC	80–100–120	0,3–0,5–0,7

The above figures are guidelines for use with BT50 machine tools at depth of cut (a_p) of 1,5 mm.
The above recommended cutting conditions may require adjustment depending on machine rigidity and workpiece rigidity.

→ H5

→ G63-G66

"METAL SLASH MILL"
MSX Type

Ultra High Feed

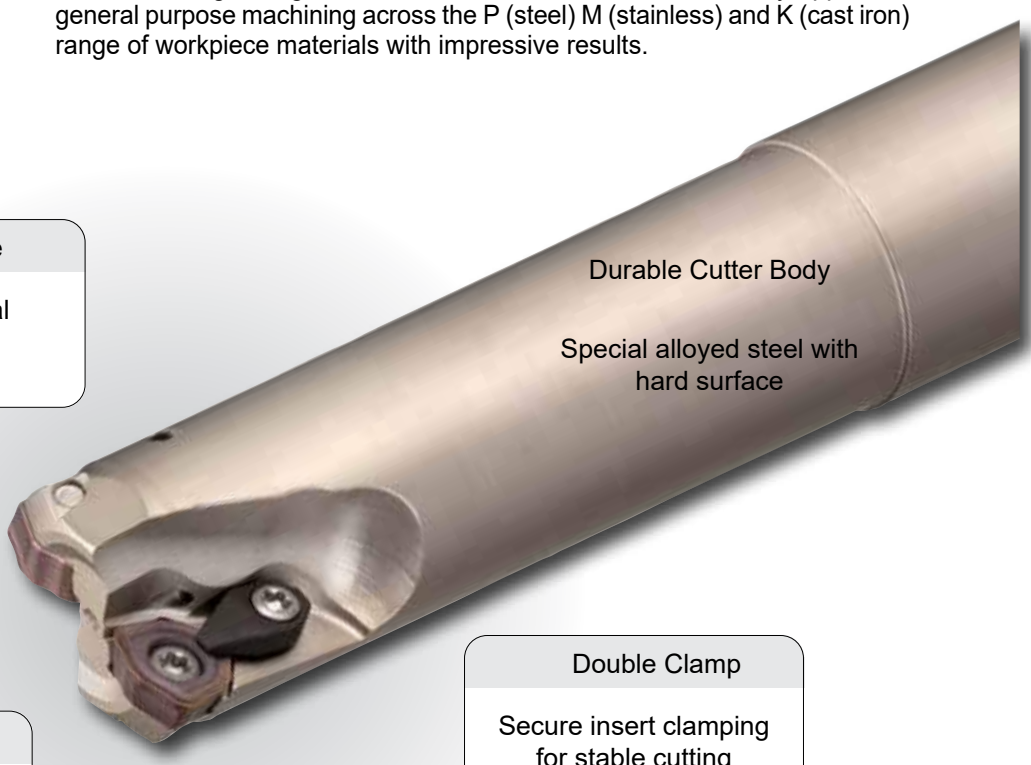
Boosts Productivity – Cuts Costs

■ Features

The Metal Slash Mill type MSX is a new multi function high shear milling cutter with ultra high feed capability suitable for face milling, slotting, plunging and helical boring. At 50GPa the ultra hard Super ZX coated inserts feature a sharp cutting edge which demonstrates extreme resistance to wear and heat massively boosting productivity and tool life.

The vibration free cutting action ensures accurate sizing, improved surface finish, and protection of the machine tool/workpiece from damage. Inserts are double clamped in wide chip gullets to maximise rigidity and chip evacuation with temperature at the cutting edge being easily controlled via an optional air blast through integral coolant holes.The MSX cutter is readily applied to general purpose machining across the P (steel) M (stainless) and K (cast iron) range of workpiece materials with impressive results.

■ Advantages



Integral Coolant Hole

Otimised chip removal – massive chip avacuation pockets

Wide Application Range

Face milling, slotting, helical boring and plunging

Low Cutting Force

Unique insert shape reduces cutting force

Durable Cutter Body

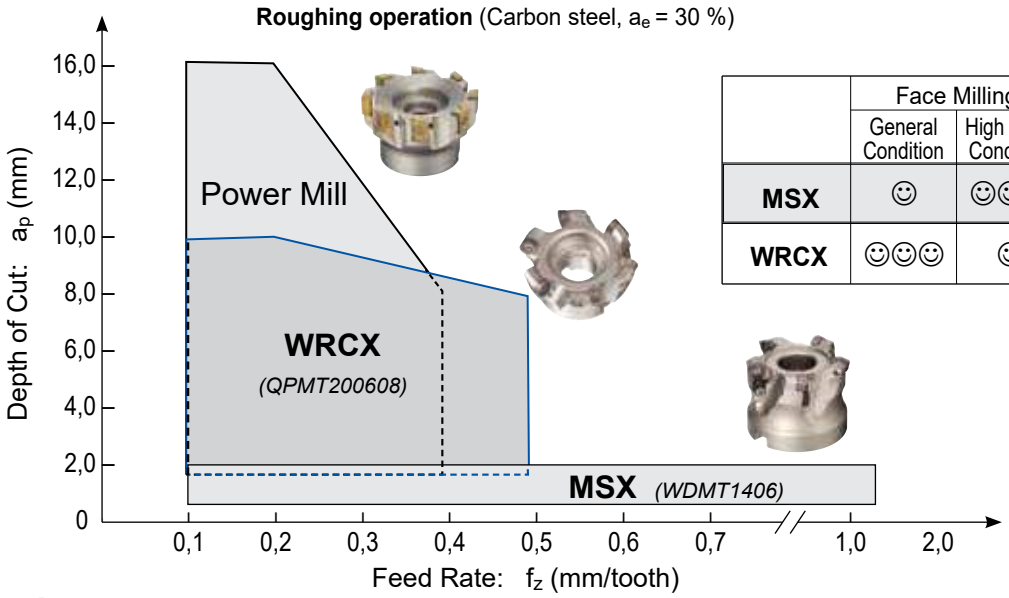
Special alloyed steel with hard surface

Double Clamp

Secure insert clamping for stable cutting

■ Application Range

Roughing operation (Carbon steel, a_e = 30 %)



	Face Milling		Slotting	Helical Boring	Profiling
	General Condition	High Feed Condition			
MSX	☺	☺☺☺	☺	☺☺☺	–
WRCX	☺☺☺	☺	☺	☺☺	☺☺

☺☺☺ excellent
☺☺ very good
☺ good

● = Euro stock
❍ = Japan stock

❑ = Delivery on request

Recommended Tightening Torque (N·m)

"METAL SLASH MILL"
MSX 06000/08000 ES/EM/EW

"METAL SLASH MILL"
MSX 12000/14000 ES/EM/EW

1,0 mm 20° | 1,5 mm 20° | 2,0 mm 20° | 2,5 mm 20°

Fig. 1

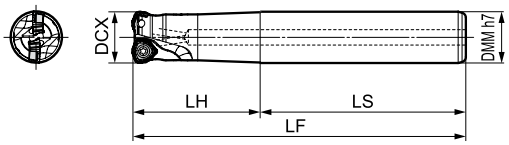
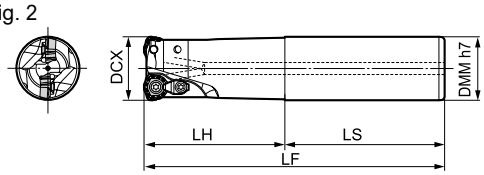


Fig. 2



Body

For insert type : WDMT 0603 □□□□

Cat. No.	Stock	Dimensions (mm) DCX	DMM	LH	LS	LF	No.of teeth	Fig.
MSX 06016 ES	❑	16	16	30	80	110	2	1
06016 EM	●	16	16	70	80	150	2	1
06016 EM15	❑	16	15	30	120	150	2	1
MSX 06017 EM	❍	17	16	20	130	150	2	1
MSX 06018 EM	❍	18	16	20	130	150	2	1
MSX 06020 ES	●	20	20	50	80	130	3	1
06020 EM	●	20	20	100	80	180	3	1
06020 EM19	❑	20	19	50	130	180	3	1
MSX 06022 EM	❍	22	20	30	150	180	3	1
MSX 06025 ES	●	25	25	60	80	140	3	1
06025 ES24	❑	25	24	60	80	140	3	1
06025 EM	●	25	25	120	130	250	3	1
06025 EM24	❑	25	24	60	190	250	3	1
MSX 06020 EW	●	20	20	50	80	130	3	1
MSX 06025 EW	●	25	25	60	80	140	3	1

Body

For insert type : WDMT 0804 □□□□

Cat. No.	Stock	Dimensions (mm) DCX	DMM	LH	LS	LF	No.of teeth	Fig.
MSX 08020 ES	●	20	20	50	80	130	2	1
08020 EM	●	20	20	100	80	180	2	1
08020 EM19	❑	20	19	50	130	180	2	1
MSX 08022 EM	❍	22	20	30	150	180	2	1
MSX 08025 ES	●	25	25	60	80	140	2	2
08025 EM	●	25	25	120	130	250	2	2
08025 EM24	❑	25	24	60	190	250	2	2
MSX 08028 EM	❑	28	25	40	210	250	2	2
MSX 08032 ES	❍	32	32	70	80	150	3	2
08032 EM	❑	32	32	120	130	250	3	2
MSX 08035 EM	❍	35	32	50	200	250	3	2
MSX 08020 EW	●	20	20	50	80	130	2	1
MSX 08025 EW	●	25	25	60	80	140	2	2
MSX 08032 EW	●	32	32	70	80	150	3	2

Body

For insert type : WDMT 1205 □□□□

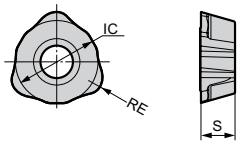
Cat. No.	Stock	Dimensions (mm) DCX	DMM	LH	LS	LF	No.of teeth	Fig.
MSX 12032 ES	●	32	32	70	80	150	2	2
12032 EM	●	32	32	120	130	250	2	2
MSX 12035 EM	❍	35	32	50	200	250	2	2
MSX 12040 ES	❍	40	32	50	100	150	3	2
12040 EM	❍	40	32	50	200	250	3	2
MSX 12050 EM	❑	50	42	50	200	250	4	2
MSX 12032 EW	●	32	32	70	80	150	2	2

Body

For insert type : WDMT 1406 □□□□

Cat. No.	Stock	Dimensions (mm) DCX	DMM	LH	LS	LF	No.of teeth	Fig.
MSX 14040 ES	❑	40	32	50	100	150	2	2
14040 EM	❑	40	32	50	200	250	2	2
MSX 14050 ES	❑	50	42	50	100	150	3	2
MSX 14050 EM	❑	50	42	50	200	250	3	2
14063 ES	❑	63	42	50	100	150	4	2
MSX 14063 EM	❑	63	42	50	200	250	4	2

Inserts



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

Cat. No.	ACP200	ACP300	ACK200	ACK300	Dimensions (mm) IC	S	RE	Applicable Endmill
WDMT0603 ZDTR	●	●	❍	●	6,35	3,0	1,5	MSX06000E□
0603 ZDTR-H	●	●	❍	●				
WDMT0804 ZDTR	●	●		●	8,5	4,0	2,0	MSX08000E□
0804 ZDTR-H	●	●	❍	●				
WDMT1205 ZDTR	●	●		●	12	5,0	2,0	MSX12000E□
1205 ZDTR-H	●	●	❍	●				
WDMT1406 ZDTR	●	●	❍	●	14	6,0	2,0	MSX14000E□
1406 ZDTR-H	●	●		●				

ZDTR-H : Stronger cutting edge

Identification Details

MSX	06	016	E	S
Cutter type	Insert size	Cutter Diameter	Shank Type	S: Short type with cylindrical shank M: Long type with cylindrical shank W: Short type with Weldon shank

Spare Parts

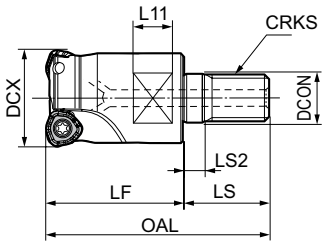
Insert Screw		Insert Wrench	Clamp	C Ring	Clamp Screw	Applicable Endmill
	N·m					MSX - E□
BFTX 02505 IP	1,5	TRDR 08 IP	–	–	–	MSX 06000E□
BFTX 0306 IP	2,0	TRDR 08 IP	–	–	–	MSX 08020E□, MSX 08022E□
BFTX 0306 IP	2,0	TRDR 08 IP	CCH 3,5	CR 03	BFTX 03510 IP 08	MSX 08025E□, MSX 08028E□, MSX 08032E□, MSX 08035E□
BFTX 0409 IP	3,0	TRDR 15 IP	CCH 3,5	CR 03	BFTX 03510 IP 15	MSX 12000E□
BFTX 0511 IP	5,0	TRDR 20 IP	CCH 4,5	CR 03	BFTX 04513 IP 20	MSX 14000E□

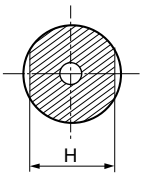
→ G67

Exchangeable Head Endmills
MSX 06000/08000 M

1,0 mm 20°

High feed and high efficiency machining endmills





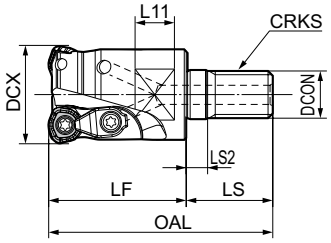
Axial rake angle: 8°
Radial rake angle: -3° – -8°

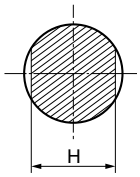
Modular Type

1,5 mm 20° (MSX 08000M)

2,0 mm 20° (MSX 12000M)

High feed and high efficiency machining endmills





Axial rake angle: 8°
Radial rake angle: -3° – -8°

Heads

For insert type : WDMT 0603

Cat. No.	Stock	Dimensions (mm)									No. of teeth
		DC	DCON	CRKS	OAL	LF	LS2	LS	L11	H	
MSX 06016M08Z2	●	16	8,5	M8	42	25	5	17	8	13	2
06018M08Z2	❍	18	8,5	M8	42	25	5	17	8	13	2
MSX 06020M10Z3	●	20	10,5	M10	49	30	5	19	8	15	3
06022M10Z3	❑	22	10,5	M10	49	30	5	19	8	15	3
MSX 06025M12Z3	●	25	12,5	M12	56	35	5	21	10	19	3

Inserts are not included.

Heads

For insert type : WDMT 0804

Cat. No.	Stock	Dimensions (mm)									No. of teeth
		DC	DCON	CRKS	OAL	LF	LS2	LS	L11	H	
MSX 08025M12Z2	●	25	12,5	M12	56	35	5	21	10	19	2
08028M12Z2	❑	28	12,5	M12	56	35	5	21	10	19	2
MSX 08030M16Z3	❑	30	17,0	M16	63	40	5	23	10	24	3
08032M16Z3	●	32	17,0	M16	63	40	5	23	10	24	3
MSX 08035M16Z3	❍	35	17,0	M16	63	40	5	23	10	24	3

Inserts are not included.

Heads

For insert type : WDMT 1205

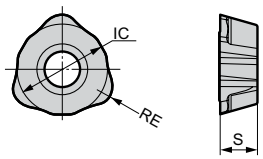
Cat. No.	Stock	Dimensions (mm)									No. of teeth
		DC	DCON	CRKS	OAL	LF	LS2	LS	L11	H	
MSX 12032M16Z2	●	32	17,0	M16	63	40	5	23	10	24	2
12035M16Z2	❍	35	17,0	M16	63	40	5	23	10	24	2
MSX 12040M16Z3	●	40	17,0	M16	63	40	5	23	10	24	3

Inserts are not included.

Inserts

Application	Coated Carbide			
General Purpose	P M	P M	K H	
Roughing	P M	P M		K H

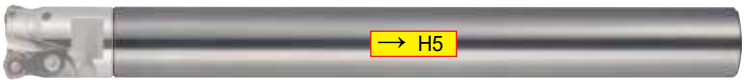
Cat. No.	ACP200	ACP300	ACK200	ACK300	Dimensions (mm) IC	S	RE	Applicable Endmill
WDMT 0603 ZDTR	●	●	❍	●	6,35	3,0	1,5	MSX06000M□
0603 ZDTR-H	●	●	❍	●				
WDMT 0804 ZDTR	●	●		●	8,5	4,0	2,0	MSX08000M□
0804 ZDTR-H	●	●	❍	●				
WDMT 1205 ZDTR	●	●		●	12	5,0	2,0	MSX12000M□
1205 ZDTR-H	●	●	❍	●				



H – Strong Cutting Edge

Identification Details

MSX	06	016	M08	Z2
Cutter type	Insert size	Diameter	Mounting screw	No. of teeth



Spare Parts

Clamp Screw		Insert Wrench	Clamp	C Ring	Insert Screw	Applicable Endmill
	N·m					
BFTX 02505 IP	1,5	TRDR 08 IP	–	–	–	MSX 06016M – MSX 06025M
BFTX 0306 IP	2,0	TRDR 08 IP	CCH 3,5	CR 03	BFTX 03510 IP 08	MSX 08025M – MSX 08035M
BFTX 0409 IP	3,0	TRDR 15 IP	CCH 3,5	CR 03	BFTX 03510 IP 15	MSX 12032M – MSX 12040M

● = Euro stock
❍ = Japan stock
❑ = Delivery on request
N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions

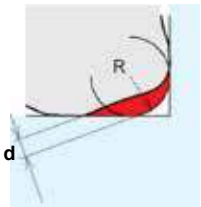
Work Material		Coated Carbide Grade	Cutting Speed v_c (m/min)	Insert Cat. No.	Endmill Type (Ø DC) 16 a_p (mm)	16 Feed rate (mm/tooth)	20 a_p (mm)	20 Feed rate (mm/tooth)	25 a_p (mm)	25 Feed rate (mm/tooth)	32 a_p (mm)	32 Feed rate (mm/tooth)	40 a_p (mm)	40 Feed rate (mm/tooth)	Shell Type (Ø DC) 50–66 a_p (mm)	50–66 Feed rate (mm/tooth)	80–100 a_p (mm)	80–100 Feed rate (mm/tooth)
P	General Steel (Below HB200)	ACP200	100–**150**–200	WDMT 0603	0,8	0,8	0,8	0,8	0,8	0,8	–	–	–	–	–	–	–	–
				WDMT 0804	–	–	1,0	1,0	1,0	1,2	1,0	1,2	–	–	–	–	–	–
				WDMT 1205	–	–	–	–	–	–	1,2	1,4	1,2	1,4	1,2	1,4	–	–
				WDMT 1406	–	–	–	–	–	–	–	–	1,5	1,5	1,5	1,5	1,5	1,5
P	Alloy Steel (Below HRC45)	ACP200	80–**130**–180	WDMT 0603	0,7	0,8	0,7	0,8	0,7	0,8	–	–	–	–	–	–	–	–
				WDMT 0804	–	–	0,8	1,0	0,8	1,2	0,8	1,2	–	–	–	–	–	–
				WDMT 1205	–	–	–	–	–	–	1,0	1,4	1,0	1,4	1,0	1,4	–	–
				WDMT 1406	–	–	–	–	–	–	–	–	1,3	1,5	1,3	1,4	1,3	1,5
M	Stainless Steel X5CRNI1810, Others	ACP300	80–**120**–150	WDMT 0603	0,8	0,7	0,8	0,7	0,8	0,7	–	–	–	–	–	–	–	–
				WDMT 0804	–	–	1,0	0,8	1,0	0,8	1,0	0,8	–	–	–	–	–	–
				WDMT 1205	–	–	–	–	–	–	1,2	1,2	1,2	1,2	1,2	1,2	–	–
				WDMT 1406	–	–	–	–	–	–	–	–	1,5	1,3	1,5	1,3	1,5	1,3
K	Cast Iron GG, GGG	ACK300	100–**150**–200	WDMT 0603	0,8	1,0	0,8	1,0	0,8	1,0	–	–	–	–	–	–	–	–
				WDMT 0804	–	–	1,0	1,2	1,0	1,4	1,0	1,4	–	–	–	–	–	–
				WDMT 1205	–	–	–	–	–	–	1,2	1,5	1,2	1,5	1,2	1,5	–	–
				WDMT 1406	–	–	–	–	–	–	–	–	1,5	1,8	1,5	1,8	1,5	1,8
H	Hardened Steel (Below HRC50)	ACK300	40–**80**–100	WDMT 0603	0,5	0,5	0,5	0,5	0,5	0,5	–	–	–	–	–	–	–	–
				WDMT 0804	–	–	0,5	0,6	0,5	0,8	0,5	0,8	–	–	–	–	–	–
				WDMT 1205	–	–	–	–	–	–	0,6	1,0	0,6	1,0	0,6	1,0	–	–
				WDMT 1406	–	–	–	–	–	–	–	–	1,0	1,2	1,0	1,2	1,0	1,2

Insert Cat. No.	Max a_p	RE
WDMT 0603....	1,0	1,5
WDMT 0804....	1,5	2,0
WDMT 1205....	2,0	2,0
WDMT 1406....	2,5	2,0

- The above recommended cutting conditions may require adjustment according to machine rigidity and work rigidity.
  The above figures are guidelines for use with the BT50 machine tool.
- The above cutting conditions assume a tool overhang length of L/D = 3 (i.e. overhang length is 3 times tool diameter) or less.
  When tool overhang is **more than L/D = 3 and less than or equal L/D = 5**, settings should be adjusted to approximately **70 to 80 %** of those indicated in the above cutting conditions (i.e. a_p and Feed Rate).
  When tool overhang is **more than L/D = 5 and less than or equal L/D = 8**, settings should be adjusted to approximately **50 to 60 %** of those indicated in the above cutting conditions (i.e. a_p and Feed Rate).

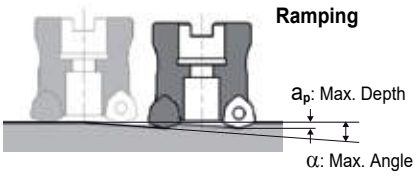
■ Information for Programming

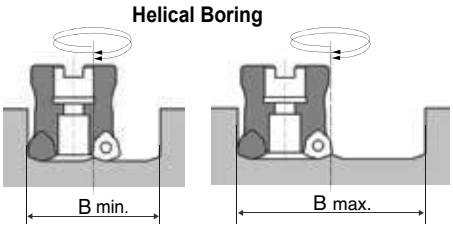
For machine programming, please use the theoretical corner radius (R) shown in the list.
Maximum depth (d) between theoretical radius and actual profile will be left on the finished surface, as shown below.



Body	Insert	Theoretical Radius (R)	Remaining Depth (d)
MSX **06**000	WDMT **06**03....	2,0	0,403
MSX **08**000	WDMT **08**04....	2,5	0,593
MSX **12**000	WDMT **12**05....	3,0	1,030
MSX **14**000	WDMT **14**06....	3,5	1,219

■ Plunging and Helical Boring





Cutter Ø	WDMT0603ZDTR a_p: max 1,0 Ramping α max.	Helical boring min. øB	Helical boring max. øB	WDMT0804ZDTR a_p: max 1,5 Ramping α max.	Helical boring min. øB	Helical boring max. øB	WDMT1205ZDTR a_p: max 2,0 Ramping α max.	Helical boring min. øB	Helical boring max. øB	WDMT1406ZDTR a_p: max 2,5 Ramping α max.	Helical boring min. øB	Helical boring max. øB
16	**6°00'**	**21**	**31**									
17	5°00'	23	33									
18	4°30'	25	35									
20	**3°30'**	**29**	**39**	**7°30'**	**25**	**38**						
22	3°00'	33	43	5°30'	29	42						
25	**2°00'**	**39**	**48**	**4°00'**	**35**	**48**						
28				3°00'	41	54						
32				**2°30'**	**49**	**62**	**6°30'**	**42**	**63**			
35				2°00'	55	68	5°00'	48	69			
40				**1°30'**	**65**	**78**	**4°00'**	**58**	**79**	**6°00'**	**53**	**78**
50							**2°30'**	**78**	**99**	**3°30'**	**73**	**98**
63							**2°00'**	**103**	**124**	**2°00'**	**99**	**124**
66							1°30'	109	130	1°45'	105	130
80										**1°30'**	**133**	**158**
100										**1°00'**	**173**	**198**

WFXH Type

Expansion

General Features

WaveMill WFXH type is a high efficiency, multi-purpose cutter, that uses the WFX series inserts for high-feed roughing and a variety of processes.

Characteristics

Stable, high-efficiency milling with superior cutting edge sharpness.
Supports various types of processes (ramping and helical milling).
Able to use the selection of inserts from the WFX series.

Notes on Corner Finishing - Remaining Material

Actual machined corners will have uncut and overcut portions due to the shape of the inserts.

Fig. 1

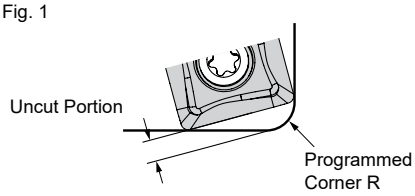
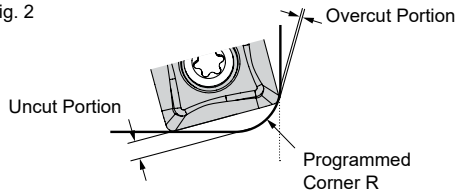


Fig. 2



● WFXH 08000 Type

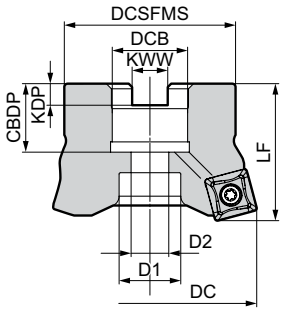
Programmed Corner R	SOMT 08○○04-□			SOMT 08○○08-□			SOMT 08○○12-□		
	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape
2,0	1,41	0	Fig. 1	1,30	0	Fig. 1	1,21	0	Fig. 1
2,5	1,30	0,02	Fig. 2	1,19	0,01	Fig. 2	1,09	0	Fig. 2
3,0	-	-	-	-	-	-	0,98	0,05	Fig. 2

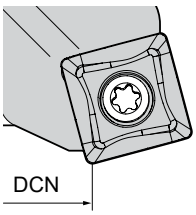
● WFXH 12000 Type

Programmed Corner R	SOMT 12○○04-□			SOMT 12○○08-□			SOMT 12○○12-□			SOMT 12○○16-□		
	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape	Uncut Portion	Overcut Portion	Shape
2,0	2,58	0	Fig. 1	2,48	0	Fig. 1	2,37	0	Fig. 1	2,25	0	Fig. 1
2,5	2,47	0	Fig. 1	2,37	0	Fig. 1	2,25	0	Fig. 1	2,14	0	Fig. 1
3,0	2,36	0	Fig. 1	2,26	0	Fig. 1	2,14	0	Fig. 1	2,11	0	Fig. 1
3,5	2,24	0,01	Fig. 2	2,14	0	Fig. 1	2,03	0	Fig. 1	1,91	0	Fig. 1
4,0	-	-	-	2,03	0,04	Fig. 2	1,91	0,03	Fig. 2	1,8	0,01	Fig. 2

Minimum Cutting Diameter

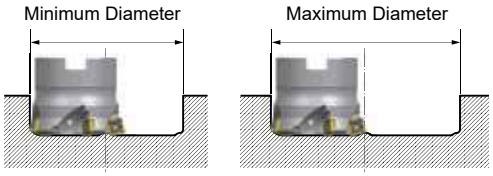
Minimum cutting diameter (DCN) will depend on the insert that is used. Using an insert with a large nose radius is recommended for the WFXH type.



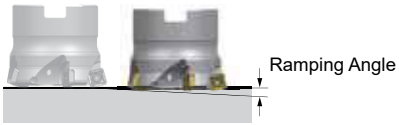


Body Cat. No.	DC	DCN based on insert nose			
		R0,4	R0,8	R1,2	R1,6
WFXH 08025 M	25	9,69	9,48	9,27	-
08032 M	32	16,6	16,4	16,2	-
WFXH 12040 M	40	15,8	15,5	15,3	15,1

Taper Cutting and Helical Milling



Minimum and Maximum Diameters



Ramping Angle

Insert Cat. No.	DC	Helical Millilng		Taper Cutting
		Min.	Max.	Max. Ramping Angle
SOMT 08○○04-□	25	35	49	1°30'
	32	49	63	0°30'
SOMT 08○○08-□	25	35	48	3°
	32	49	62	1°30'
SOMT 08○○12-□	25	34	47	4°30'
	32	48	61	2°30'
SOMT 12○○04-□	40	56	79	1°
SOMT 12○○08-□	40	56	78	1°30'
SOMT 12○○12-□	40	55	77	2°30'
SOMT 12○○16-□	40	55	76	3°30'

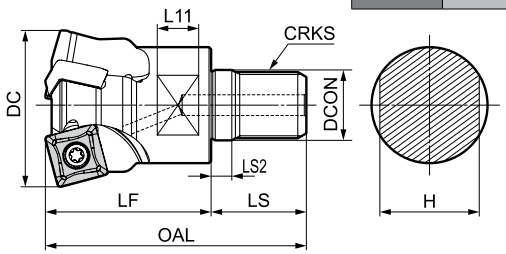
● = Euro stock
❍ = Japan stock

→ G68-G71

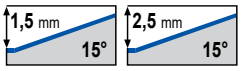
Recommended Tightening Torque (N·m)

WFXH 08000/12000 M

Modular Type



Rake Angle		
Radial	-6°	
Axial	6°	



(08000M Type) (12000M Type)

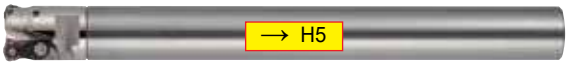
Head

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		DC	DCON	CRKS	OAL	LF	LS2	LS	L11	H		
WFXH08025M12Z2	❍	25	12,5	M12	56	35	5	21	10	19	2	0,1
08032M12Z3	❍	32	17,0	M16	63	40	5	23	10	24	3	0,2

Inserts are not included.

Identification Details

WFX	08	020	M10	Z2
Cutter Series	Insert Size	Cutter Diameter	Screw Size	No. of Teeth



→ H5

Head

Cat. No.	Stock	Dimensions (mm)									No. of Teeth	Weight (kg)
		DC	DCON	CRKS	OAL	LF	LS2	LS	L11	H		
WFXH12040M12Z3	❍	40	17,0	M16	63	40	5	23	10	24	3	0,2

Inserts are not included.

Inserts

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

Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCU2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	T4500Z	RE	Fig.
SOMT 080304 PZER L	●	❍	●	●	❍	❍	❍	●	●	●	–	–		0,4	1
080308 PZER L	●	❍	❍	●	●	❍	●	●	●	●	–	–		0,8	1
SOMT 080304 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–		0,4	1
080308 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–		0,8	1
080312 PZER G	●		●	●	●			●	●	●	–	–		1,2	1
SOMT 080308 PZER H	●	❍	●	●	●	❍	●	●	●	●	–	–		0,8	1
080312 PZER H	●		●	●	●		❍	●		●	–	–		1,2	1
SOET 080304 PZER G	●				❍			●	●		–	–	❍	0,4	1
080308 PZER G	●			❍			●			●	–	–	❍	0,8	1
080312 PZER G	●			●	❍			●	❍	❍	–	–	❍	1,2	1
SOET 080302 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●		0,2	1
080304 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●		0,4	1
080308 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●		0,8	1
SOMT 120408 PDER L	●	❍	●	●	●	❍	●	●	●	●	–	–		0,8	2
SOMT 120404 PDER G	●	❍	❍	●	●	❍	●	●	●	●	–	–		0,4	2
120408 PDER G	●	❍	●	●	●	❍	●	●	●	●	–	–	❍	0,8	2
120412 PDER G	●		❍	●	❍		●	❍	❍	●	–	–		1,2	2
120416 PDER G	●		●	●	●		❍	❍	❍		–	–		1,6	2
SOMT 120408 PDER H	●	❍	●	●	●	❍	●	●	●	●	–	–		0,8	2
SOET 120408 PDFR S	–	–	–	–	–	–	–	–	–	–	●	●		0,8	2

Fig. 1

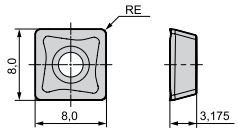
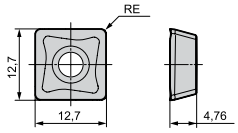


Fig. 2



Spare Parts

Applicable Cutter	Screw		Insert Wrench
		N·m	
WFXH08000M	BFTX0306IP	2,0	TRDR08IP
WFXH12000M	BFTX03512IP	3,0	TRDR15IP

Recommended Cutting Conditions

ISO	Work Material	Grade	Cutting Speed (v_c (m/min)	Insert Cat. No.	Ø 25		Ø 32		Ø 40		Ø 50		Ø 63	
					a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)	a_p (mm)	f_z (mm/t)
P	General Steel <200HB	ACP200	100–**150**–200	SOMT08	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8	0,8
				SOMT12	-	-	-	-	1,0	1,0				
	Alloy Steel <HRC45	ACP200	80–**130**–180	SOMT08	0,7	0,8	0,7	0,8	0,7	0,8	0,7	0,8	0,7	0,8
				SOMT12	-	-	-	-	0,8	1,0	0,8	1,0	0,8	1,0
M	Stainless Steel (X5CrNiS18 10, other)	ACM300	80–**120**–150	SOMT08	0,8	0,7	0,8	0,7	0,8	0,7	0,8	0,7	0,8	0,7
				SOMT12	-	-	-	-	1,0	0,8	1,0	0,8	1,0	0,8
K	Cast Iron FC, FCD	ACK300	100–**150**–200	SOMT08	0,8	1,0	0,8	1,0	0,8	1,0	0,8	1,0	0,8	1,0
				SOMT12	-	-	-	-	1,0	1,2	1,0	1,2	1,0	1,2
H	Hardened Steel <HRC50	ACK300	40–**80**–100	SOMT08	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
				SOMT12	-	-	-	-	0,6	0,8	0,6	0,8	0,6	0,8

The above recommended cutting conditions may require adjustment according to machine rigidity and work rigidity. The above figures are guidelines for use with the BT50 machine tool.
The above conditions assume a tool overhang length of L/D = 3 (i.e. overhang length is 3 times tool diameter) or less.
When tool overhang is more than L/D = 3 and less or equal L/D = 5, settings should be adjusted to approximately 70 % to 80 % of those indicated in the above cutting conditions (i.e. ap and ft).
When tool overhang is more than L/D = 5 and less or equal L/D = 8, settings should be adjusted to approximately 50 % to 60 % of those indicated in the above cutting conditions (i.e. ap and ft).

Expansion

General Features

The Sumi Dual Mill DFC type employs cost effective double-sided inserts for high toughness and enhanced accuracy.
The double-side inserts are flexible and reduces costs.

Large Line-up

- Diameter from Ø 25 mm to Ø 200 mm
- Available as standard, fine and extra-fine pitch
- Bore diameter: metric
- Insert geometry: L, G, GS, H

Cutter Body

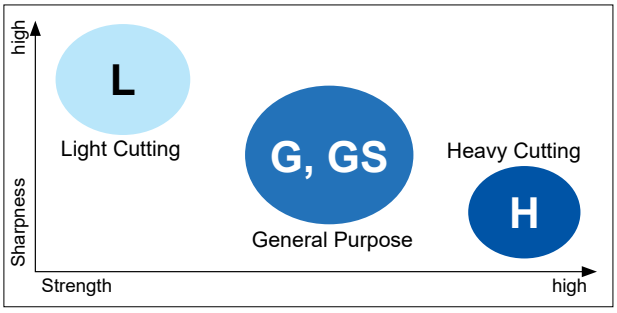
Type		Cat. No.	Diameter (mm)	No. of Teeth	Image
Shank	Standard Pitch	DFC 09000 E	Ø 25 – Ø 80	2–5	
	Fine Pitch	DFCM 09000 E	Ø 32 – Ø 80	3–7	
Shell	Standard Pitch	DFC 09000 RS	Ø 50 – Ø 200	4–10	
	Fine Pitch	DFCM 09000 RS	Ø 50 – Ø 200	5–16	
→G22-G25	Extra-Fine Pitch	DFCF 09000 RS	Ø 50 – Ø 200	6–20	

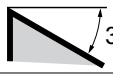
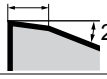
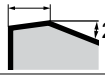
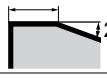
New Insert Design Provides Excellent Machining Accuracy

Inserts

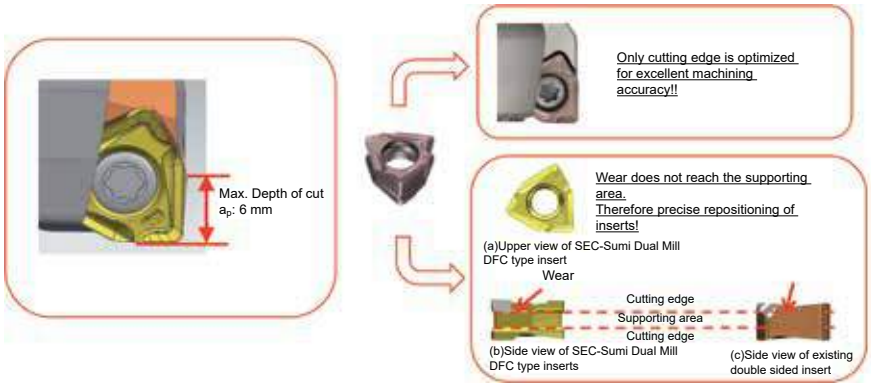
Cat. No.	RE0,4	RE0,8	RE1,2	RE1,6
XNMU0606__PNER-L	●	●		
XNMU0606__PNER-G Expansion	●	●	●	●
XNMU0606__PNER-GS	●	●	●	●
XNMU0606__PNER-H		●	●	●

Chipbreaker Selection Map



Work Material	P M K S			
Chipbreaker	L type	G type	GS type	H type
Applications	Light cutting	General purpose to interrupted milling	Shoulder milling	Heavy cutting
Cutting edge geometry	 30°	0,1 mm  20°	0,1 mm  20°	0,15 mm  20°
Features	Low rigidity milling, reduction of burrs	Face milling	Shoulder milling	Roughing, heavy interrupted and hardness steel milling

Stable and High Cutting Performance Combined with High Toughness



● = Euro stock
❍ = Japan stock

Recommended Tightening Torque (N·m)

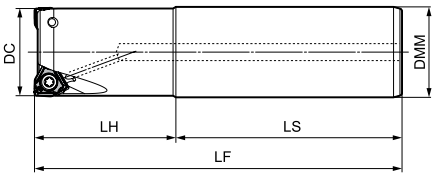
DFC(M) 09000 E

Expansion

Body – Shank Type

Rake Angle	Radial	-9°
	Axial	-5°

Max. a_p: 6 mm



Body – Dimensions

● DFC type, Standard Pitch

Cat. No.	Stock	Dimensions (mm)					No. of Teeth
		DC	DMM	LH	LS	LF	
DFC 09025E	●	25	25	40	80	120	2
DFC 09032E	●	32	32	50	80	130	2
09040E	●	40	32	50	80	130	3
09050E	●	50	32	50	80	130	3
DFC 09050E-42		50	42	50	100	150	3
DFC 09063E	●	63	32	50	80	130	4
DFC 09063E-42		63	42	50	100	150	4
DFC 09080E	●	80	32	50	80	130	5
DFC 09080E-42		80	42	50	100	150	5

● DFCM type, Medium Pitch

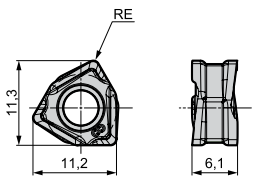
Cat. No.	Stock	Dimensions (mm)					No. of Teeth
		DC	DMM	LH	LS	LF	
DFCM 09032E	●	32	32	50	80	130	3
09040E	●	40	32	50	80	130	4
09050E	●	50	32	50	80	130	5
DFCM 09050E-42		50	42	50	100	150	5
DFCM 09063E	●	63	32	50	80	130	6
DFCM 09063E-42		63	42	50	100	150	6
DFCM 09080E	●	80	32	50	80	130	7
DFCM 09080E-42		80	42	50	100	150	7

Identification Details

DFC	M	09	050	E
Cutter Series	M: Medium	Insert Size	Cutter Diameter	Shank Type

Inserts

Application	Coated Carbide										
High Speed / Light Cutting	P M S	P M K	P M			K	K		M S		
General Purpose Cutting	P M S	P M K	P M	P M		K	K		M S	M S	
Rough Cutting	P M S			P M	P M			K		M S	
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
XNMU 060604 PNER-L	●	❍		●	●	❍		●		●	0,4
060608 PNER-L	●	❍		●	●	❍		●		●	0,8
XNMU 060604 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,4
060608 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
060612 PNER-G	●		●	●	●		●	●	●	●	1,2
060616 PNER-G	●		❍	●	●		●	●	●	●	1,6
XNMU 060604 PNER-GS	❍		●	●	●				●	●	0,4
060608 PNER-GS	❍	❍	●	●	●	❍			●	●	0,8
060612 PNER-GS	❍		❍	❍	❍				❍	❍	1,2
060616 PNER-GS	❍		❍	❍	❍				❍	❍	1,6
XNMU 060608 PNER-H	●	❍	●	●	●	❍	●	●	●	●	0,8
060612 PNER-H	●		❍	●	●		●	●	❍	●	1,2
060616 PNER-H	●		❍	●	❍		❍	●	❍	●	1,6



Spare Parts

Screw	Wrench
BFTX03512IP	TRDR15IP 5,0 N·m

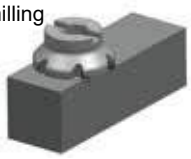
Recommemded Cutting Conditions

Min.–**Optimum**–Max.

ISO	Work-material	Hardness (HB)	Cutting Speed (m/min)	Feed Rate	Depth of Cut (mm)	Grade
P	General Steel	180–280	150–**200**–250	0,10–**0,20**–0,30	< 6	ACU2500 ACP200 ACP300 XCU2500
	Soft Steel	≤180	180–**250**–350	0,15–**0,25**–0,35	< 6	
	Die Steel	200–220	100–**150**–200	0,10–**0,18**–0,25	< 4	
M	Stainless Steel	–	160–**205**–250	0,12–**0,18**–0,25	< 6	ACU2500 ACM300
K	Cast Iron	250	100–**175**–250	0,10–**0,20**–0,30	< 6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Alloy	–	30–**50**–80	0,10–**0,20**–0,30	< 6	ACU2500 ACM200 ACM300

Applications and Recommended Chipbreakers

Face milling
G



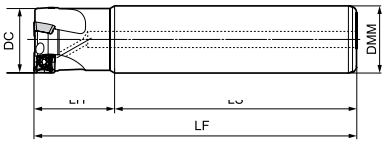
Shoulder milling
GS

Shot milling

Side face milling
G, GS

Body - Shank Type

WFX08000E

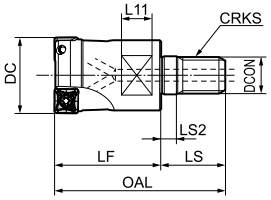


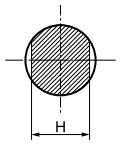
Modular Type

Rake Angle	Radial	-6°
	Axial	12°

6 mm
90°

WFX08000M





Body - WFX_E, Standard Pitch

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

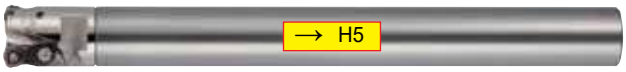
Inserts are not included.

Head

Cat. No.	Stock	Dimensions (mm)									No. of Teeth
		DC	DCON	CRKS	OAL	LF	LS2	LS	L11	H	
WFX 08020 M10Z2	●	20	10,5	M10	49	30	5	19	8	15	2
08022 M10Z2	●	22	10,5	M10	49	30	5	19	8	15	2
WFX 08025 M12Z2	●	25	12,5	M12	56	35	5	21	10	19	2
08028 M10Z2	●	28	12,5	M12	56	35	5	21	10	19	2
WFX 08030 M16Z3	●	30	17,0	M16	63	40	5	23	10	24	3
08032 M16Z3	●	32	17,0	M16	63	40	5	23	10	24	3
08040 M16Z3	●	40	17,0	M16	63	40	5	23	10	24	3

Identification Details

WFX	08	020	M10	Z2
Cutter Series	Insert Size	Cutter Diameter	Screw Size	No. of Teeth



→ H5

Body - WFXM_E, Medium Pitch

Cat. No.	Stock	Dimensions (mm)					No. of Teeth
		DC	DMM	LH	LS	LF	
WFXM 08025 E	●	25	25	30	90	120	3
WFXM 08032 E	●	32	32	30	90	120	4
08040 E	●	40	32	30	90	120	4
08050 E	●	50	32	30	90	120	5
08063 E	●	63	32	30	90	120	6

Inserts are not included.

Identification Details

WFX	M	08	025	E
Cutter Series	M: Medium	Insert Size	Cutter Diameter	Endmill Type

Inserts

Dimensions (mm)

Fig. 3

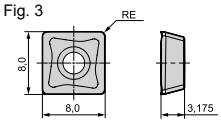
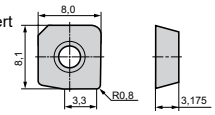


Fig. 4
Wiper Insert



Application	Coated Carbide										Carbide	DLC		
High Speed / Light cut	K P M S	P K M	P			K	K		M S		K N	N		
General Purpose	K P M S	P K M		P M	P M	K	K		M S	M S		N		
Roughing	K P M S			P M	P M			K		M S				
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	RE	Fig.
SOMT 080304 PZER L	●	❍	●	●	❍	❍	❍	●	●	●	–	–	0,4	3
080308 PZER L	●	❍	❍	●	●	❍	●	●	●	●	–	–	0,8	3
SOMT 080304 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,4	3
080308 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
080312 PZER G	●		●	●	●		❍	●	●	●	–	–	1,2	3
SOMT 080308 PZER H	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
080312 PZER H	●		●	●	●		❍	●	❍	●	–	–	1,2	3
SOET 080304 PZER G	●		❍	❍	❍		❍	●	●	❍	–	–	0,4	3
080308 PZER G	●		❍	❍	❍		❍	●	●	❍	–	–	0,8	3
080312 PZER G	●		❍	●	❍		❍	●	❍	❍	–	–	1,2	3
SOET 080302 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,2	3
080304 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,4	3
080308 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,8	3
XOEW 080308 PZTR W	●	–	–	–	–	–		●			–	–	0,8	4

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Cutting Speed	Feed Rate	DOC	Grades
P	General Steel	180–280	150–**200**–250	0,08–**0,12**–0,18	<6	ACU2500 ACP200 ACP300 XCU2500
	Soft Steel	≤180	180–**250**–350	0,10–**0,15**–0,20	<6	
	Die Steel	200–220	100–**150**–200	0,08–**0,12**–0,18	<4	
M	Stainless Steel	-	160–**200**–250	0,10–**0,15**–0,20	<6	ACU2500 ACM300
K	Cast Iron	250	100–**175**–250	0,10–**0,15**–0,20	<6	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non Ferrous Metal	-	300–**500**–1000	0,10–**0,15**–0,20	<6	H1 DL1000
S	Exoric Alloy	-	30–**50**–80	0,08–**0,13**–0,18	<6	ACU2500 ACM200 ACM300

Min. - **Optimum** - Max.

Spare Parts

Screw		Wrench
	N·m	
BFTX0306IP	2,0	TRDR08IP

● = Euro stock
❍ = Japan stock

→ G26-G29

N·m Recommended Tightening Torque (N·m)

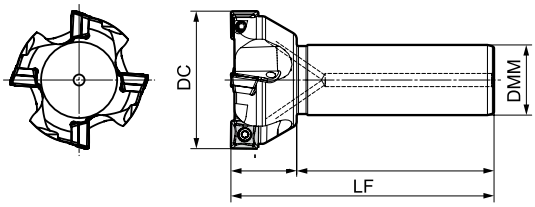
"Sumi Wave" Shoulder Mill
WFX (F) 12000 E

Body - Shank Type

Rake Angle	Radial	-8°
	Axial	8°

10 mm, 90°

WFX12000E



Body - WFX_E, Standard Pitch

Cat. No.	Stock	Dimensions (mm)					No. of Teeth
		DC	DMM	LH	LS	LF	
WFX 12040 E	●	40	32	30	90	120	3
12050 E	●	50	32	30	90	120	3
12063 E	●	63	32	30	90	120	4
12080 E	●	80	32	30	90	120	4

Inserts are not included.

Body - WFXF_E, Fine Pitch

Cat. No.	Stock	Dimensions (mm)					No. of Teeth
		DC	DMM	LH	LS	LF	
WFXF 12050 E	●	50	32	30	90	120	4
12063 E	●	63	32	30	90	120	5
12080 E	●	80	32	30	90	120	6

Inserts are not included.

Identification Details

WFX	F	12	050	E
Cutter Series	F: Fine	Insert Size	Cutter Diameter	Endmill Type

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Cutting Speed	Feed Rate	DOC	Grades
P	General Steel	180–280	150–**200**–250	0,10–**0,15**–0,20	<10	ACU2500 ACP200 ACP300 XCU2500
	Soft Steel	≤180	180–**250**–350	0,10–**0,15**–0,20	<10	
	Die Steel	200–220	100–**150**–200	0,10–**0,15**–0,20	<6	
M	Stainless Steel	-	160–**200**–250	0,10–**0,15**–0,20	<10	ACU2500 ACM300
K	Cast Iron	250	100–**175**–250	0,10–**0,15**–0,20	<10	ACU2500 ACK200 ACK300 XCU2500 XCK2000
N	Non Ferrous Metal	-	300–**500**–1000	0,10–**0,15**–0,20	<10	H1 DL1000
S	Exoric Alloy	-	30–**50**–80	0,10–**0,15**–0,20	<10	ACU2500 ACM200 ACM300

Min. - **Optimum** - Max.

Inserts

Dimensions (mm)

Fig. 3

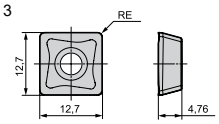
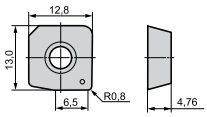


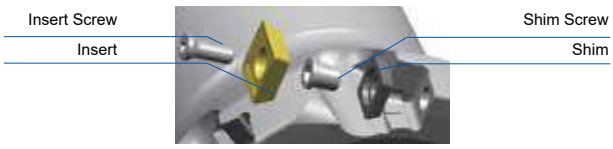
Fig. 4
Wiper Insert



Application	Coated Carbide										Carbide	DLC		
High Speed / Light cut	P M S	P K M	P			K	K		M S		K N	N		
General Purpose	P M S	P K M		P M	P M	K	K		M S	M S		N		
Roughing	P M S			P M	P M			K		M S				
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	RE	Fig.
SOMT 120408 PDER L	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
SOMT 120404 PDER G	●	❍	❍	●	●	❍	●	●	●	●	–	–	0,4	3
120408 PDER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
120412 PDER G	●		❍	●	❍		●	❍	❍	●	–	–	1,2	3
120416 PDER G	●		●	●	●		❍	❍	❍	❍	–	–	1,6	3
SOMT 120408 PDER H	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	3
SOET 120408 PDFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,8	3
XOEW 120408 PDTR W	❍	–	–	–	–	–	–	❍	–	–	–	–	–	4

Spare Parts

Shim	Shim Screw	Insert Screw		Insert Wrench	Seat Wrench
WFXS4R	BW0507F	BFTX03512IP	3,0 (N·m)	TRDR15IP	LH035



TSX Type

Expansion

General Features

High-efficient and high precision tangential shoulder milling cutter with tangentially mounted carbide inserts.

Characteristics

- Tough & Sharp cutting edge
- Very accurate and excellent surface finish
- Wide product range

Product Range

TSX Shoulder Milling Cutter

	Cat. No.	Series	Diameter Range / No of Teeth														Shape
			Ø16	Ø20	Ø25	Ø32	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160	Ø200	Ø250	Ø315	
Shell Type	TSX 08000RS	Standard Pitch					4	5	6	7							→ G30-G37
	TSXF 08000RS	Fine Pitch					6	8	10	11							
	TSX 13000RS	Standard Pitch					3	4	5	5	6	7	8	12	14	16	
	TSXM 13000RS	Medium Pitch					4	5	6	7	8	10	12	16	20	24	
	TSXF 13000RS	Fine Pitch					5	6	7	8	10	14	16				
Shank Type	TSX 08000E	Standard Pitch	2	2*	3*	3*	4	5	6	7							
	TSXF 08000E	Fine Pitch		3	4	5	6	8	10	11							
	TSX 13000E	Standard Pitch			2	2	3	4	5	5							
	TSXM 13000E	Medium Pitch				3	4	5	6	7							
	TSXF 13000E	Fine Pitch					5	6	7	8							

* Different shank diameters in stock

TSXR Repeater

Type	Cat. No.	Diameter Range / No of Teeth														Shape
		Ø16	Ø20	Ø25	Ø32	Ø40	Ø50		Ø63		Ø80		Ø100		Ø125	
Shell	TSXR 08000RS				2	3	3	4	5							→ G38-G39
	TSXR 13000RS					2	3		3	4	4	5	5	6	7	
Shank	TSXR 08000E		1	2	2	3										
	TSXR 13000E					2	3									

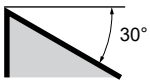
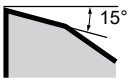
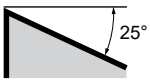
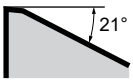
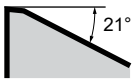
Recommended Cutting Conditions

Min. - **Optimum** - Max.

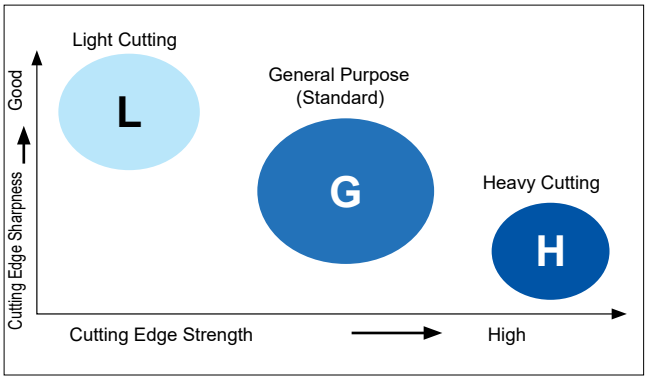
ISO	Work-material	Hardness (HB)	Cutting Speed v_c (m/min)	TSX _ _ _ E Feed Rate f_t (mm/T)	Grade
P	Carbon Steel	180–280	150–**225**–300	0,08–**0,20**–0,30	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280	75–**150**–230	0,08–**0,20**–0,30	
	Alloy Steel	180–280	100–**175**–250	0,08–**0,15**–0,25	
M	Stainless Steel	220–280	90–**135**–180	0,08–**0,15**–0,25	ACU2500 ACM200 ACM300
		>280	75–**125**–170	0,08–**0,15**–0,25	
K	Cast Iron Ductile Cast Iron	250	100–**175**–250	0,08–**0,20**–0,30	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Material	–	30–**60**–90	0,05–**0,10**–0,15	ACU2500 ACM200 ACM300

● = Euro stock

Chipbreaker Lineup

Work Material	P M K S		
Chipbreaker	L type	G type	H type
Feature	Low cutting force	General purpose	Strong edge
LNEX08 Cutting edge geometry			–
LNEX13 Cutting edge geometry			
Application	Light cut, low rigidity milling and reduced burrs	Main breaker for general purpose applications	Roughing, heavy interrupted and hardness steel milling

Chipbreaker Selection

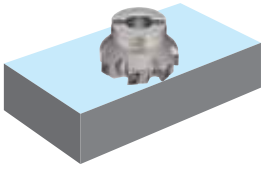


Inserts

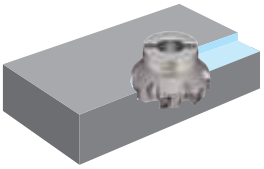
Cat. No.	RE0,4	RE0,8	RE1,2	RE1,6	RE2,4	RE3,2
LNEX0804__PNER-L	●	●				
LNEX0804__PNER-G	●	●	●	●		
LNEX1306__PNER-L	●	●				
LNEX1306__PNER-G		●		●	●	●
LNEX1306__PNER-H	●	●		●	●	●

Suitable Applications

Face milling



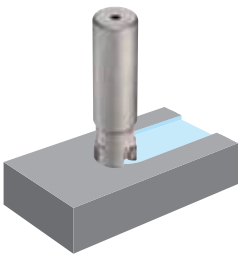
Shoulder milling



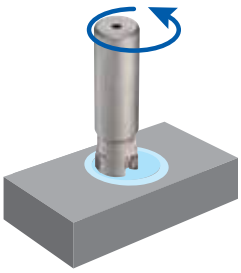
Side face milling

Slot milling

Recommended
≤ ø32 mm



Hole expansion milling



TSX(F) 08000 E

Expansion

Rake Angle	Radial	-36°– -20°	8 mm	90°
	Axial	-6°		

Shank Type

Fig. 1

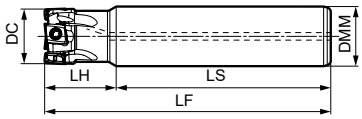
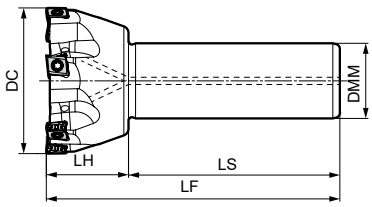


Fig. 2



Body - TSX, Standard Pitch

Cat. No.		Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Figure
TSX	08016 E	●	16	16	25	75	100	2	0,13	1
	08020 E	●	20	20	30	80	110	2	0,22	1
	08020 E-16	❍	20	16	30	80	110	2	0,15	2
	08025 E	●	25	25	30	90	120	3	0,40	1
	08025 E-20	❍	25	20	30	90	120	3	0,26	2
	08032 E	●	32	32	30	90	120	3	0,67	1
	08032 E-25	❍	32	25	30	90	120	3	0,43	2
	08040 E	●	40	32	30	90	120	4	0,72	2
	08050 E	❍	50	32	30	90	120	5	0,85	2
	08063 E	❍	63	32	35	90	125	6	1,09	2
	08080 E	❍	80	32	35	90	125	7	1,44	2

Inserts are not included.

Body - TSXF, Fine Pitch

Cat. No.		Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Figure
TSXF	08020 E	●	20	20	30	80	110	3	0,22	1
	08025 E	●	25	25	30	90	120	4	0,40	1
	08032 E	●	32	32	30	90	120	5	0,67	1
	08040 E	●	40	32	30	90	120	6	0,73	2
	08050 E	❍	50	32	30	90	120	8	0,85	2
	08063 E	❍	63	32	35	90	125	10	1,10	2
	08080 E	❍	80	32	35	90	125	11	1,42	2

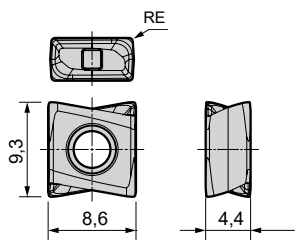
Inserts are not included.

Indexable Endmills

Inserts

Dimensions (mm)

Application	Coated Carbide									
High Speed / Light Cutting	P S	P K M	P M			K	K		M S	
General Purpose Cutting	P S	P K M	P M	P M		K	K		M S	M S
Rough Cutting	P S			P M	P M			K		M S
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 080404 PNER-L	●			●	❍		❍	●	❍	●	0,4
080408 PNER-L	●			●	❍		❍	●	❍	●	0,8
080412 PNER-L	❍			❍				❍	❍	❍	1,2
080416 PNER-L	❍			❍				❍	❍	❍	1,6
LNEX 080404 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
080408 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
080412 PNER-G	●		❍	●	●		●	●	❍	●	1,2
080416 PNER-G	●		❍	●	●		●	●	❍	●	1,6



Recommended Cutting Conditions

→ H20

Identification Details

TSX	F/M	08	032	E
Cutter Series	F: Fine Pitch M: Medium Pitch	Insert Size	Cutter Diameter	Endmill Type

Spare Parts

Insert Screw		Insert Wrench	Applicable Cutters
BFTX0306IP	2,0	TRDR08IP	TSX08016E, TSX08020E, TSXF08020E
BFTX0308IP			TSX08025E–80E, TSXF08025E–80E

● = Euro stock
❍ = Japan stock

N·m Recommended Tightening Torque (N·m)

TSX(M/F) 13000 E

Rake Angle	Radial	-31°– -15°	12 mm	90°
	Axial	-6°		

■ Shank Type

Fig. 1

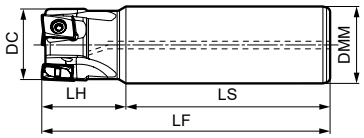
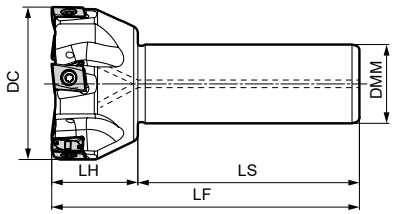


Fig. 2



● Body - TSX, Standard Pitch

Cat. No.	Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Figure
TSX 13025 E	●	25	25	35	85	120	2	0,38	1
13032 E	●	32	32	35	85	120	2	0,66	1
13040 E	●	40	32	30	90	120	3	0,71	2
13050 E	●	50	32	30	90	120	4	0,81	2
13063 E	❍	63	32	35	90	125	5	1,08	2
13080 E	❍	80	32	35	90	125	5	1,40	2

Inserts are not included.

● Body - TSXM, Medium Pitch

Cat. No.	Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Figure
TSXM 13032 E	●	32	32	35	85	120	3	0,35	1
13040 E	●	40	32	30	90	120	4	0,71	2
13050 E	●	50	32	30	90	120	5	0,80	2
13063 E	❍	63	32	35	90	125	6	1,07	2
13080 E	❍	80	32	35	90	125	7	1,41	2

Inserts are not included.

● Body - TSXF, Fine Pitch

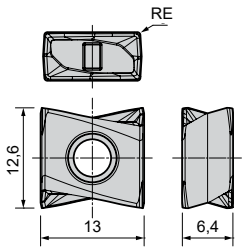
Cat. No.	Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Figure
TSXF 13040 E	●	40	32	30	90	120	5	0,70	2
13050 E	●	50	32	30	90	120	6	0,80	2
13063 E	❍	63	32	30	90	125	7	1,07	2
13080 E	❍	80	32	35	90	125	8	1,42	2

Inserts are not included.

■ Inserts

Dimensions (mm)

Application	Coated Carbide										
High Speed / Light Cutting	K M	P K M	P M			K	K		M S		
General Purpose Cutting	K M	P K M	P M	P M		K	K		M S	M S	
Rough Cutting	K M			P M	P M			K		M S	
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 130604 PNER-L	●			●	❍		❍	●	❍	●	0,4
130608 PNER-L	●			●	❍		❍	●	❍	●	0,8
130612 PNER-L	❍			●				●	●	●	1,2
130616 PNER-L	❍			❍				❍	❍	❍	1,6
130620 PNER-L	❍			❍				❍	❍	❍	2,0
130624 PNER-L	❍			❍				❍	❍	❍	2,4
130632 PNER-L	❍			❍				❍	❍	❍	3,2
LNEX 130604 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
130608 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
130612 PNER-G	❍		●	●	●		●	●	●	●	1,2
130616 PNER-G	●		❍	●	●		●	●	❍	●	1,6
130620 PNER-G	❍		❍	❍	❍		❍	❍	❍	❍	2,0
130624 PNER-G	●		❍	●	●		●	●	❍	●	2,4
130632 PNER-G	●		❍	●	●		●	●	❍	●	3,2
LNEX 130604 PNER-H	❍			❍	❍		❍	❍			0,4
130608 PNER-H	●	❍		●	●	❍	●	●			0,8
130612 PNER-H	❍			●	●		●	●			1,2
130616 PNER-H	●			●	●		●	●			1,6
130620 PNER-H	❍			❍	❍		❍	❍			2,0
130624 PNER-H	●			●	●		●	●			2,4
130632 PNER-H	●			●	●		●	●			3,2



■ Recommended Cutting Conditions

→ H20

■ Identification Details

→ H22

■ Spare Parts

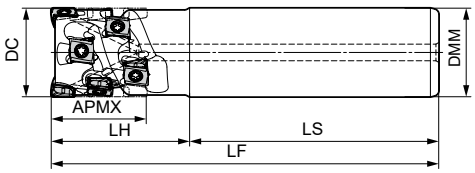
Insert Screw		Insert Wrench
BFTX03510IP	3,0	TRDR15IP

TSXR 08000 E

Expansion

Shank Type

Rake Angle		
Radial	-33° – -18°	21-40 mm
Axial	-6° – -3°	90°



Body - TSXR

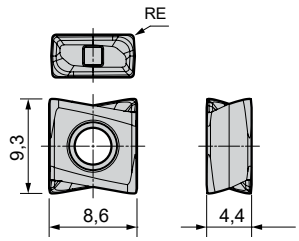
Cat. No.	Stock	Dimensions (mm)						No. of Teeth	Steps	Effective Teeth
		DC	APMX	DMM	LH	LS	LF			
TSXR 08020E2120Z01	❍	20	21	20	30	80	110	3	3	1
08025E2725Z02	❍	25	27	25	35	90	125	8	4	2
08032E3432Z02	❍	32	34	32	50	90	140	10	5	2
08040E4032Z03	❍	40	40	32	60	90	150	18	6	3

Inserts are not included.

Inserts

Dimensions (mm)

Application	Coated Carbide										
High Speed / Light Cutting	P S	P K M	P M			K	K		M S		
General Purpose Cutting	P S	P K M	P M	P M		K	K		M S	M S	
Rough Cutting	P S			P M	P M			K		M S	
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 080404 PNER-L	●			●	❍		❍	●	❍	●	0,4
080408 PNER-L	●			●	❍		❍	●	❍	●	0,8
080412 PNER-L	❍			❍				❍	❍	❍	1,2
080416 PNER-L	❍			❍				❍	❍	❍	1,6
LNEX 080404 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
080408 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
080412 PNER-G	●		❍	●	●		●	●	❍	●	1,2
080416 PNER-G	●		❍	●	●		●	●	❍	●	1,6



Recommended Cutting Conditions

Min. - **Optimum** - Max.

ISO	Work-material	Hardness	Cutting Speed v_c (m/min)	Feed Rate f_t (mm/T)	Grade
P	Carbon Steel	180–280HB	110–**200**–280	0,10–**0,20**–0,30	ACU2500 ACP100 ACP200 ACP300 XCU2500
		> 280HB	70–**135**–200	0,10–**0,20**–0,30	
	Alloy Steel	180–280HB	90–**155**–220	0,10–**0,15**–0,25	
M	Stainless Steel	220–280HB	90–**135**–180	0,10–**0,15**–0,25	ACU2500 ACM200 ACM300
		>280HB	70–**115**–160	0,10–**0,15**–0,25	
K	Cast Iron Ductile Cast Iron	250HB	125–**175**–225	0,10–**0,20**–0,30	ACU2500 ACK200 ACK300 XCU2500 XCK2000
S	Exotic Material	–	30–**60**–90	0,05–**0,10**–0,15	ACU2500 ACM200 ACM300

Identification Details

TSXR	08	025	E	27	25	Z02
Cutter Series	Insert Size	Cutter Diameter	Shank Type	Max. Depth of Cut	Shank Diameter	Effective Teeth

Spare Parts

Insert Wrench	Insert Screw	
		N·m
TRDR08IP	BFTX0308IP	2,0

Indexable Endmills

● = Euro stock
❍ = Japan stock

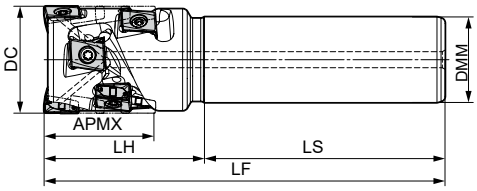
N·m Recommended Tightening Torque (N·m)

TSXR 13000 E

Rake Angle		
	Radial	-23°– -18°
	Axial	-6° – -3°

41-60 mm 90°

Shank Type



Body - TSXR

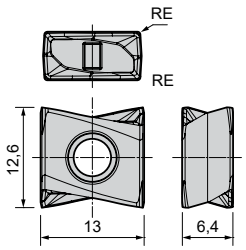
Cat. No.	Stock	Dimensions (mm)						No. of Teeth	Steps	Effective Teeth
		DC	APMX	DMM	LH	LS	LF			
TSXR 13040E4132Z02	❍	40	41	32	60	90	150	8	4	2
13050E6042Z03	❍	50	60	42	80	90	170	18	6	3

Inserts are not included.

Inserts

Dimensions (mm)

Application	Coated Carbide										
High Speed / Light Cutting	P S M	P K M	P M			K	K		M S		
General Purpose Cutting	P S M	P K M	P M	P M		K	K		M S	M S	
Rough Cutting	P S M			P M	P M			K		M S	
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	RE
LNEX 130604 PNER-L	●			●	❍		❍	●	❍	●	0,4
130608 PNER-L	●			●	❍		❍	●	❍	●	0,8
130612 PNER-L	❍			●				●	●	●	1,2
130616 PNER-L	❍			❍				❍	❍	❍	1,6
130620 PNER-L	❍			❍				❍	❍	❍	2,0
130624 PNER-L	❍			❍				❍	❍	❍	2,4
130632 PNER-L	❍			❍				❍	❍	❍	3,2
LNEX 130604 PNER-G	●	❍	❍	●	●	❍	●	●	❍	●	0,4
130608 PNER-G	●	❍	●	●	●	❍	●	●	●	●	0,8
130612 PNER-G	❍		●	●	●		●	●	●	●	1,2
130616 PNER-G	●		❍	●	●		●	●	❍	●	1,6
130620 PNER-G	❍		❍	❍	❍		❍	❍	❍	❍	2,0
130624 PNER-G	●		❍	●	●		●	●	❍	●	2,4
130632 PNER-G	●		❍	●	●		●	●	❍	●	3,2
LNEX 130604 PNER-H	❍			❍	❍		❍	❍			0,4
130608 PNER-H	●	❍		●	●	❍	●	●			0,8
130612 PNER-H	❍			●	●		●	●			1,2
130616 PNER-H	●			●	●		●	●			1,6
130620 PNER-H	❍			❍	❍		❍	❍			2,0
130624 PNER-H	●			●	●		●	●			2,4
130632 PNER-H	●			●	●		●	●			3,2



Recommended Cutting Conditions

→ H24

Identification Details

TSXR	13	050	E	60	42	Z03
Cutter Series	Insert Size	Cutter Diameter	Shank Type	Max. Depth of Cut	Shank Diameter	Effective Teeth

Spare Parts

Insert Wrench	Insert Screw	
		N·m
TRDR15IP	BFTX03510IP	3,0

"Wave Mill" Series
WEZ Type

Expansion

General Features

- Supports various machining operations
- Excellent machining quality
- Excellent sharpness with low resistance
- General-purpose grade applicable to any work material

Product Range

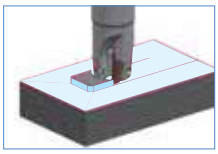
Type	Cat. No.	Diameter Range (mm) / No of Teeth																	
		Ø14	Ø16	Ø18	Ø20	Ø22	Ø25	Ø26	Ø28	Ø30	Ø32	Ø35	Ø40	Ø50	Ø63	Ø80	Ø100	Ø125	Ø160
Shell	WEZ 11000RS	→ G48											4, 6	5,7	6, 8	7, 10	9, 12		
	WEZ 11000R (Inch)															7, 10	9, 12		
	WEZ 17000RS	→ G50											3, 4	3, 5	4, 6	4, 7	5, 8	6, 9, 11	8, 10 12
	WEZ 17000R (Inch)															4, 7	5, 8	6, 9, 11	8, 10 12
Shank	WEZ 11000E	1	2*	2	2*, 3*	3	2, 3*, 4*		4	4	2, 3, 4, 5*	5	2, 4, 6	5, 7	8	10			
	WEZ 11000ES	1	2*		3*		4*												
	WEZ 11000EL	1	2*	2	2*	2	2*, 3		2	2	2*, 3	2, 3	2	3					
	WEZ 17000E						2*		2	3	2, 3*	3	3, 4	3*, 5*	4*, 6*	7			
	WEZ 17000ES						2				3								
	WEZ 17000EL						2		2	2	2*, 3	2	2, 3, 4	3*, 5*	4*, 6*				
Modular	WEZ 11000M		2	2	2, 3	3	2, 3, 4	4, 5	4, 5	2, 4, 5	2, 3, 4, 5	2, 5	2, 4, 5, 6						
	WEZ 17000M						2, 3		2	2, 3	2, 3, 4	2, 3	2, 3, 4						

* Different shank diameters in stock

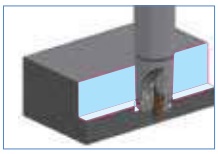
Suitable Applications

- Supports Ramping, Helical Milling, Plunge Cutting

Face milling

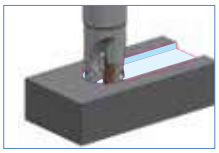


Shoulder milling

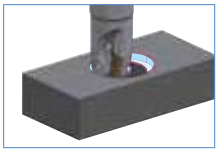


Side face milling

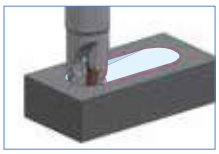
Groove milling



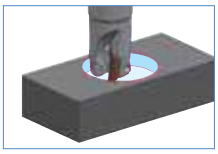
Hole expansion milling



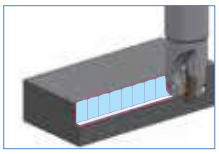
Ramping



Helical milling

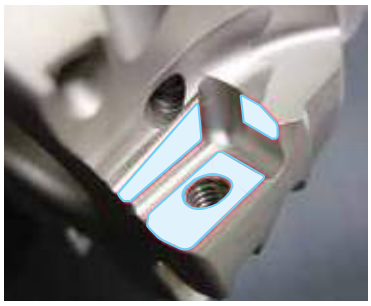


Plunge cutting



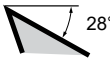
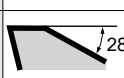
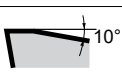
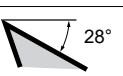
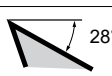
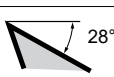
Optimised Body Design

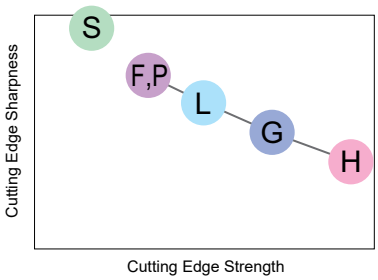
Wide guide face for stable insert clamping.



WEZ11 type

Chipbreaker Lineup

Work Material	P	M	K	S	H	N
Chipbreaker	L Type	G Type	H Type	F Type	P Type	S Type
AO_T11 Cutting edge geometry		28°	20°	28°	28°	 28°
AO_T17 Cutting edge geometry	 28°	20°	 10°	 28°	 28°	 28°
Applications	Light cut, low rigidity machining	Main breaker for general purpose to interrupted machining	Heavy cut, heavy interrup-ted machining, hardened steel	Light cut, finishing, low-burr design	Light cut, high-precision machining, high surface wall quality	For non-ferrous metals



● = Euro stock

Product Range Inserts

Main Grade: ACU2500; S-Type: H20, DL2000

Cat. No.	Nose Radius (mm)													
	R0,2	R0,4	R0,5	R0,8	R1,0	R1,2	R1,6	R2,0	R2,4	R3,0	R3,2	R4,0	R5,0	R6,4
AOMT 11T3_ _ PEER-G	●	●	●	●	●	●	●	●	●	●	●			
AOMT 11T3_ _ PEER-H		●		●		●	●							
AOET 11T3_ _ PEER-F	●	●	●	●	●	●	●	●	●	●	●			
AOET 11T3_ _ PEER-P16	●	●	●	●	●	●								
AOET 11T3_ _ PEER-P20	●	●	●	●	●	●								
AOET 11T3_ _ PEER-P25	●	●	●	●	●	●								
AOET 11T3_ _ PEFR-S	●	●	●	●	●	●	●	●	●	●	●			
AOMT 1705_ _ PEER-L	●	●		●		●	●							
AOMT 1705_ _ PEER-G	●	●	●	●	●	●	●	●	●	●	●	●	●	●
AOMT 1705_ _ PEER-H		●		●		●	●							
AOET 1705_ _ PEER-F	●	●	●	●	●	●	●	●	●	●	●	●	●	●
AOET 1705_ _ PEER-P25	●	●	●	●	●	●								
AOET 1705_ _ PEER-P32	●	●	●	●	●	●								
AOET 1705_ _ PEFR-S	●	●	●	●	●	●	●	●	●	●	●	●	●	●

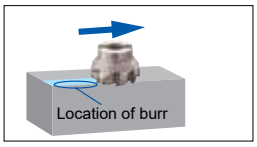
Lineup of Chipbreakers for Ground Inserts

F Type

Cutting edge specialized for sharpness and machining accuracy

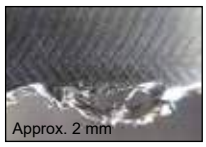
Sharpness from ground finish enables burr control.

Excellent squareness with all diameters.



WEZ

Competitor



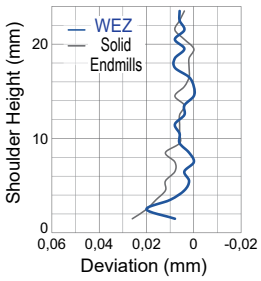
Machine:	Vertical Machining Centre BT50,
Work Material	X5CrNiS18 9
Tool:	WEZ 11050 RS07 (Ø 50, 7 teeth)
Insert:	AOET11T308PEER-F (ACU2500)
Cutting Conditions:	v_c = 120 m/min, f_z = 0,12 mm/t, a_p = 1 mm, a_e = 30 mm, dry

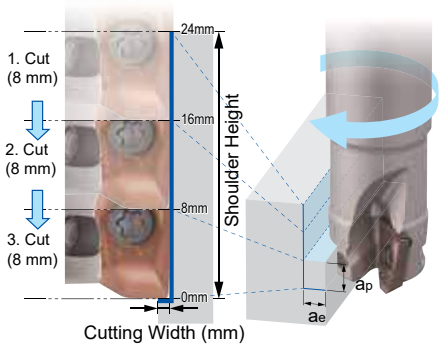
P Type

Chipbreaker for wall surface squareness equivalent to solid endmills

Premium item with cutting edge shape optimised for each cutter diameter while maintaining the F type chipbreaker's sharpness.

Enables wall surface squareness equal to solid endmills through a blade shape optimised for each tool diameter.





P Type Chipbreaker Selection

Cat. No.	Cutter Diameter (mm)										
	Ø14	Ø16	Ø18	Ø20	Ø22	Ø25	Ø28	Ø30	Ø32	Ø35	=> Ø40
AOET11T3_ _PEER-P_ _	-P16		-P20		–	-P25		–			
AOET1705_ _PEER-P_ _	–					-P25		-P32			–

Machine:	Vertical Machining Centre BT50,
Work Material:	C50
Tool:	WEZ 11020 E03 (Ø 20, 3 teeth)
Insert:	AOET11T308PEER-P20 (ACU2500)
Cutting Conditions:	v_c = 150 m/min, f_z = 0,1 mm/t, a_p = 8 mm x 3 passes, a_e = 1 mm, dry

S Type

Sharp edge chipbreaker for non-ferrous metals, with excellent adhesion resistance

Suppresses adhesion with rake face lapping.

DLC coat inserts available for further improved adhesion resistance.

WEZ

No Adhesion

Competitor A

Adhesion

Competitor B

Adhesion

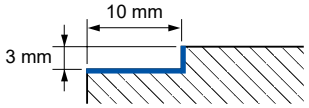
Machine:	Vertical Machining Centre BT50,
Work Material:	AlSi12Cu
Tool:	WEZ 11020 E03 (Ø 20, 3 teeth)
Insert:	AOET11T308PEER-S (H20)
Cutting Conditions:	v_c = 350 m/min, f_z = 0,1 mm/t, a_p = 3 mm, a_e = 10 mm, dry

Expansion

Recommended Cutting Conditions

WEZ11 Type

Cutter: WEZ 11020 E03
Insert: AO_T11T3 type
Cutting Data: a_p = 3 mm, a_e = 10 mm, dry



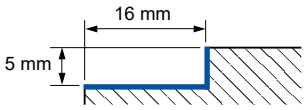
Min. - **Optimum** - Max.

ISO	Material	HB	Chipbreaker	Grade										
				ACU2500	XCU2500	ACP2000	ACP3000	T2500A	XCK2000	ACK2000	ACK3000	ACM200	ACM300	DL2000
				Feed Rate (mm/tooth)										
				0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,18	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,08–**0,15**–0,20	0,05–**0,10**–0,15
				Cutting Speed v_c (m/min)										
P	Unalloyed steel, <0, 15%C, annealed	125	G	270–**320**–370	300–**350**–400	300–**350**–400	250–**300**–350	230–**280**–330						
	· , <0, 45%C, annealed	190	G	170–**220**–270	200–**250**–300	200–**250**–300	150–**200**–250	130–**180**–230						
	· , <0, 45%C, tempered	250	G	140–**180**–220	160–**200**–245	160–**200**–245	120–**160**–200	105–**145**–185						
	· , <0, 75%C, annealed	270	G	110–**145**–175	130–**165**–195	130–**165**–195	100–**130**–165	85–**115**–150						
	· , <0, 75%C, tempered	300	G	70–**90**–110	80–**100**–120	80–**100**–120	60–**80**–100	50–**70**–90						
	Low alloyed steel, annealed	180	G	160–**205**–255	190–**235**–280	190–**235**–280	140–**190**–235	120–**170**–215						
	· , tempered	275	G	90–**120**–150	110–**135**–165	110–**135**–165	80–**110**–140	70–**100**–125						
	· , tempered	300	G	85–**110**–130	100–**125**–150	100–**125**–150	75–**100**–125	65–**90**–115						
	· , tempered	350	G	60–**80**–100	70–**90**–110	70–**90**–110	50–**70**–90	45–**65**–85						
	High alloyed and tool steel, annealed	200	G	140–**180**–220	160–**200**–245	160–**200**–245	120–**160**–205							
	· , tempered	325	G	55–**70**–85	60–**80**–100	60–**80**–100	50–**65**–80							
M	Stainless steel, ferritic/martensitic, annealed	200	G	110–**140**–170	160–**190**–210							140–**170**–190	90–**110**–140	
	· , martensitic, tempered	240	G	100–**125**–150	145–**170**–190							125–**150**–170	80–**100**–125	
	· , austenitic, plunged	180	G	120–**150**–180	170–**200**–220							150–**180**–200	100–**120**–150	
K	Grey cast iron		G	150–**200**–250	250–**300**–350				250–**300**–350	250–**300**–350	170–**220**–270			
	Nodular cast iron		G	90–**120**–150	150–**180**–210				150–**180**–210	150–**180**–210	100–**130**–160			
S	High tempered resist. alloys, Fe based, annealed		G	30–**40**–55								35–**45**–60	25–**35**–50	
	· , hardened		G	60–**80**–100								70–**90**–110	50–**70**–90	
N	Aluminium alloy, Si < 12,6%		S											500–**750**–100
	· , Si > 12,6%		S											170–**200**–250
	Copper alloy		S											300–**330**–350

The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine, work shape and clamping. They will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.
For groove milling, reduce the feed rate approximately 70 % of the corresponding value shown above.

WEZ17 Type

Cutter: WEZ 17032 E03
Insert: AO_T1705 type
Cutting Data: a_p = 5 mm, a_e = 16 mm, dry



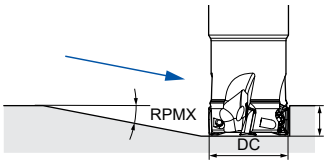
Min. - **Optimum** - Max.

ISO	Material	HB	Chipbreaker	Grade										
				ACU2500	XCU2500	ACP2000	ACP3000	T2500A	XCK2000	ACK2000	ACK3000	ACM200	ACM300	DL2000
				Feed Rate (mm/tooth)										
				0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,15**–0,22	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,10–**0,20**–0,28	0,05–**0,10**–0,15
				Cutting Speed v_c (m/min)										
P	Unalloyed steel, <0, 15%C, annealed	125	G	285–**335**–390	315–**360**–420	315–**360**–420	265–**315**–370	240–**295**–345						
	· , <0, 45%C, annealed	190	G	180–**230**–285	210–**265**–315	210–**265**–315	160–**210**–265	135–**190**–240						
	· , <0, 45%C, tempered	250	G	145–**190**–230	170–**210**–255	170–**210**–255	130–**170**–215	110–**155**–195						
	· , <0, 75%C, annealed	270	G	115–**150**–185	135–**170**–205	135–**170**–205	100–**135**–170	90–**125**–155						
	· , <0, 75%C, tempered	300	G	70–**90**–115	85–**105**–125	85–**105**–125	65–**85**–105	55–**75**–95						
	Low alloyed steel, annealed	180	G	170–**220**–265	200–**245**–295	200–**245**–295	150–**200**–250	130–**180**–225						
	· , tempered	275	G	100–**130**–155	115–**145**–175	115–**145**–175	85–**115**–145	75–**105**–135						
	· , tempered	300	G	90–**115**–140	105–**130**–155	105–**130**–155	75–**105**–130	65–**90**–120						
	· , tempered	350	G	65–**85**–100	75–**95**–115	75–**95**–115	55–**75**–95	50–**70**–85						
	High alloyed and tool steel, annealed	200	G	145–**185**–230	170–**215**–255	170–**215**–255	130–**170**–215							
	· , tempered	325	G	55–**75**–90	65–**85**–100	65–**85**–100	50–**65**–85							
M	Stainless steel, ferritic/martensitic, annealed	200	G	115–**145**–175	165–**195**–215							145–**175**–195	100–**115**–145	
	· , martensitic, tempered	240	G	105–**130**–155	150–**175**–195							130–**155**–175	85–**105**–130	
	· , austenitic, plunged	180	G	125–**155**–190	180–**210**–230							160–**190**–210	105–**125**–160	
K	Grey cast iron		G	160–**210**–265	265–**315**–370				265–**315**–370	265–**315**–370	180–**230**–285			
	Nodular cast iron		G	95–**125**–160	160–**190**–220				160–**190**–220	160–**190**–220	105–**140**–170			
S	High tempered resist. alloys, Fe based, annealed		G	30–**40**–60								35–**45**–60	25–**35**–50	
	· , hardened		G	60–**85**–105								75–**95**–115	50–**75**–95	
N	Aluminium alloy, Si < 12,6%		S											500–**750**–100
	· , Si > 12,6%		S											170–**200**–250
	Copper alloy		S											300–**330**–350

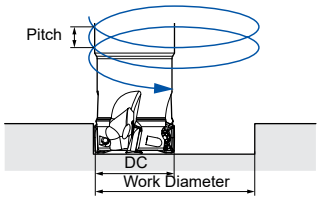
The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine, work shape and clamping. They will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.
For groove milling, reduce the feed rate approximately 70 % of the corresponding value shown above.

■ Ramping / Helical Milling Upper Limits

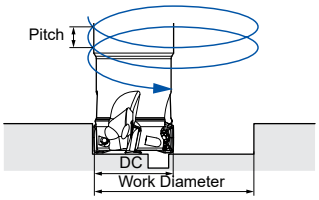
Ramping



Flat Bottom Machining



Machining with Prepared Hole



● WEZ11 Type

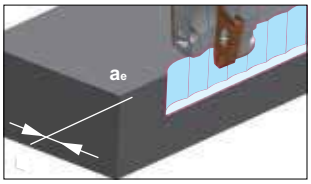
DC Ø (mm)	Max.Ramping Angle	Flat Bottom Machining				Machining with Prepared Hole	
	RPMX (°)	Max. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)
14	13,2	25,3	8,4	23,1	5,9	19,0	1,9
16	10,5	29,3	7,6	27,0	5,6	21,7	1,5
18	8,1	33,3	6,7	30,9	5,0	25,2	1,4
20	6,5	37,3	6,0	34,9	4,6	29,1	1,3
22	5,3	41,3	5,4	38,8	4,3	32,9	1,3
25	4,1	47,3	4,8	44,8	3,9	38,9	1,3
28	3,4	53,3	4,4	50,7	3,6	44,9	1,3
30	3,0	57,3	4,2	54,7	3,5	48,8	1,3
32	2,7	61,3	4,0	58,7	3,3	52,8	1,2
35	2,3	67,3	3,8	64,6	3,1	58,8	1,2
40	1,8	77,3	3,4	74,6	2,9	68,8	1,2
50	1,2	97,3	3,0	94,6	2,6	88,8	1,1
63	0,8	123,3	2,8	120,5	2,5	114,7	1,1

● WEZ17 Type

DC Ø (mm)	Max.Ramping Angle	Flat Bottom Machining				Machining with Prepared Hole	
	RPMX (°)	Max. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)
25	10,8	47,3	13,0	41,0	8,3	33,1	1,8
28	8,1	53,3	11,1	46,9	7,5	39,0	1,8
30	7,0	57,3	10,2	50,9	7,0	43,0	1,8
32	6,1	61,3	9,5	54,9	6,7	47,0	1,7
35	5,1	67,3	8,7	60,8	6,2	53,0	1,7
40	4,0	77,3	7,7	70,8	5,7	63,0	1,7
50	2,5	97,3	6,5	90,7	5,0	83,0	1,6
63	1,8	123,3	5,6	116,7	4,5	109,0	1,6

* The table above shows values with nose radius 0,8 mm

■ Plunge Cutting - Upper Limit for Radial Width a_e



Type	Max. a_e (mm)
WEZ11	3
WEZ17	5

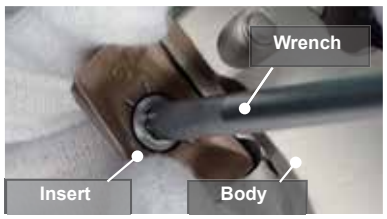
■ Precautions for Mounting

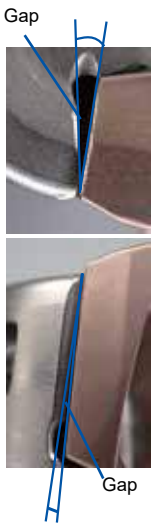
(1) Clean the mounting seat and contact parts.

(2) Apply screw lubrication to the screw thread as well as the screw head face to prevent seizure.

(3) While pressing the insert solidly against the seat surface, tighten at the screws with the included wrench.

(4) After tightening, check that there are no gaps between the surfaces.





WEZ 11000 E

Rake Angle	Radial	-7° – -18°
	Axial	6° – 15°

10 mm 90°

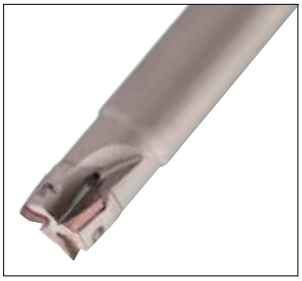


Fig. 1

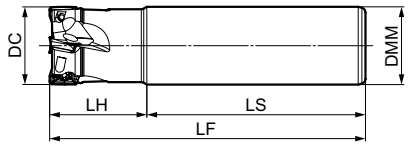
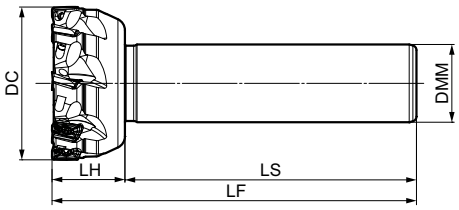


Fig. 2



Body - WEZ (Shank Type)

Dimensions (mm)

Cat. No.	Stock	DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Fig.
WEZ 11014E01	●	14	16	25	55	80	1	0,10	1
11016E02	●	16	16	25	75	100	2	0,13	1
11016E02-12	●	16	12	25	75	100	2	0,07	2
11018E02	●	18	16	25	75	100	2	0,13	2
11020E02	●	20	20	30	80	110	2	0,23	1
11020E02-16	●	20	16	30	80	110	2	0,15	2
11020E03	●	20	20	30	80	110	3	0,22	1
11020E03-16	●	20	16	30	80	110	3	0,14	2
11022E03	●	22	20	30	80	110	3	0,23	1
11025E02	●	25	25	35	85	120	2	0,40	1
11025E03	●	25	25	35	85	120	3	0,40	1
11025E03-20	●	25	20	35	85	120	3	0,26	2
11025E04	●	25	25	35	85	120	4	0,39	2
11025E04-20	●	25	20	35	85	120	4	0,26	2
11028E04	●	28	25	35	85	120	4	0,41	1
11030E04	●	30	25	40	90	130	4	0,46	1
11032E02	●	32	32	40	90	130	2	0,74	1
11032E03	●	32	32	40	90	130	3	0,73	1
11032E04	●	32	32	40	90	130	4	0,73	2
11032E05	●	32	32	40	90	130	5	0,72	2
11032E05-25	●	32	25	40	90	130	5	0,46	2
11035E05	●	35	32	40	90	130	5	0,75	2
11040E02	●	40	32	30	120	150	2	0,96	2
11040E04	●	40	32	30	120	150	4	0,94	2
11040E06	●	40	32	30	120	150	6	0,93	2
11050E05	●	50	32	30	120	150	5	1,04	2
11050E07	●	50	32	30	120	150	7	1,04	2
11063E08	●	63	32	30	120	150	8	1,24	2
11080E10	●	80	32	30	120	150	10	1,52	2

Inserts are sold separately.

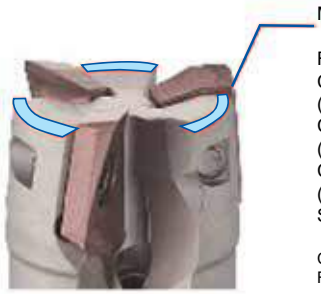
Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZ 11014E01	BFTX0305IP	2,0	TRDR08IP
11016E02(-12)			
11018E02			
11020E02(-16)	BFTX0306IP	1,5	
11020E03(-16)			
11022E03			
11025E02			
11025E03(-20)			
11025E04(-20)			
11028E04			
11030E04			
11032E02			
11032E03			
11032E04			
11032E05(-25)			
11035E05			
11040E02			
11040E04			
11040E06			
11050E05			
11050E07			
11063E08			
11080E10			

Identification Details

WEZ	11	025	E	02	-	22
Cutter Series	Insert Size	Cutter Diameter	Round Shank	Number of Teeth		Shank Diameter

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.



Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT11T324PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT11T330PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT11T332PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
○ = Japan stock
❑ = On request
[–] =Not available
N·m Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 11T302PEER-G	●		❑	●		❑	●	●	●	–	–	●	0,2	1
11T304PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
11T305PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
11T308PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
11T310PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
11T312PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
11T316PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
11T320PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
11T324PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
11T330PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	2
11T332PEER-G	●		❑	❑		❑	❑	●	●	–	–		3,2	2
AOMT 11T304PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
11T308PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
11T312PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
11T316PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,6	1
AOET 11T302PEER-F	●		–			–		–		–	–	–	0,2	1
11T304PEER-F	●		–			–		–		–	–	–	0,4	1
11T305PEER-F	●		–			–		–		–	–	–	0,5	1
11T308PEER-F	●		–			–		–		–	–	–	0,8	1
11T310PEER-F	●		–			–		–		–	–	–	1,0	1
11T312PEER-F	●		–			–		–		–	–	–	1,2	1
11T316PEER-F	●		–			–		–		–	–	–	1,6	1
11T320PEER-F	●		–			–		–		–	–	–	2,0	1
11T324PEER-F	●		–			–		–		–	–	–	2,4	1
11T330PEER-F	●		–			–		–		–	–	–	3,0	2
11T332PEER-F	●		–			–		–		–	–	–	3,2	2
AOET 11T302PEER-P16	●		–			–		–		–	–	–	0,2	1
11T304PEER-P16	●		–			–		–		–	–	–	0,4	1
11T305PEER-P16	●		–			–		–		–	–	–	0,5	1
11T308PEER-P16	●		–			–		–		–	–	–	0,8	1
11T310PEER-P16	●		–			–		–		–	–	–	1,0	1
11T312PEER-P16	●		–			–		–		–	–	–	1,2	1
11T302PEER-P20	●		–			–		–		–	–	–	0,2	1
11T304PEER-P20	●		–			–		–		–	–	–	0,4	1
11T305PEER-P20	●		–			–		–		–	–	–	0,5	1
11T308PEER-P20	●		–			–		–		–	–	–	0,8	1
11T310PEER-P20	●		–			–		–		–	–	–	1,0	1
11T312PEER-P20	●		–			–		–		–	–	–	1,2	1
11T302PEER-P25	●		–			–		–		–	–	–	0,2	1
11T304PEER-P25	●		–			–		–		–	–	–	0,4	1
11T305PEER-P25	●		–			–		–		–	–	–	0,5	1
11T308PEER-P25	●		–			–		–		–	–	–	0,8	1
11T310PEER-P25	●		–			–		–		–	–	–	1,0	1
11T312PEER-P25	●		–			–		–		–	–	–	1,2	1
AOET 11T302PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
11T304PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
11T305PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
11T308PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
11T310PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
11T312PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
11T316PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
11T320PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
11T324PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
11T330PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	2
11T332PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	2

Fig. 1

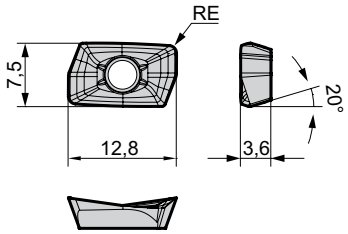
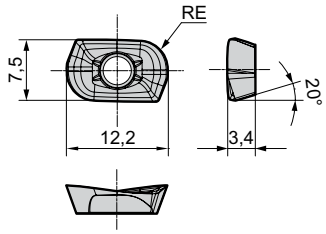


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P16 is applicable to cutter diameters Ø 14 mm and Ø 16 mm.
*P20 is applicable to cutter diameters Ø 18 mm, Ø 20 mm.
*P25 is applicable to cutter diameters Ø 25 mm, Ø 28 mm.

Recommended Cutting Conditions

→ H28

WEZ 11000 ES

Series for Multi-Tasking Machines

Rake Angle	Radial	-14° – -18°
	Axial	6° – 10°

10 mm 90°

Fig. 1

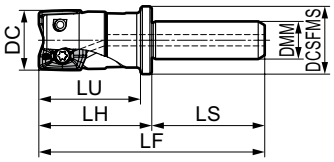
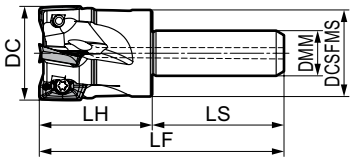


Fig. 2



Body - WEZ (Short Shank Type)

Dimensions (mm)

Cat. No.	Stock	DC	DCSFMS	DMM	LH	LU	LS	LF	No. of Teeth	Weight (kg)	Fig.
WEZ 11014ES01-12	❍	14	18	12	30	27	35	65	1	0,05	1
11016ES02-10	❍	16	18	10	25	22	30	55	2	0,04	1
11016ES02-12	❍	16	18	12	30	27	35	65	2	0,05	1
11020ES03-10	❍	20	18	10	25	–	30	55	3	0,04	2
11020ES03-12	❍	20	18	12	30	–	35	65	3	0,06	2
11020ES03-16	❍	20	23	16	30	27	40	70	3	0,10	1
11025ES04-12	❍	25	23	12	30	–	35	65	4	0,09	2
11025ES04-16	❍	25	23	16	30	–	40	70	4	0,12	2

Inserts are sold separately.

Spare Parts

Applicable Cutters	Insert Screw	Wrench	
		N·m	
WEZ 11014ES01-12	BFTX0305IP	1,5	TRDR08IP
11016ES02-10			
11016ES02-12			
11020ES03-10	BFTX0306IP		
11020ES03-12			
11020ES03-16			
11025ES04-12			
11025ES04-16			

Identification Details

WEZ	11	020	E	S	03	-	12
Cutter Series	Insert Size	Cutter Diameter	Round Shank	Short Shank	Number of Teeth		Shank Diameter

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

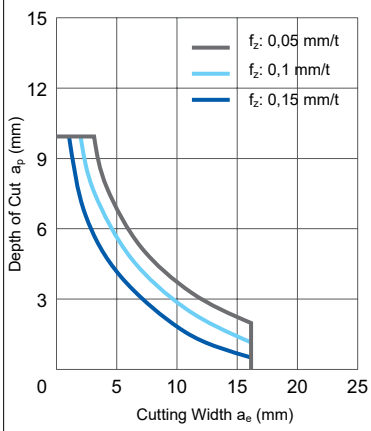
Modify this edge.

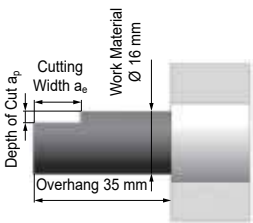
Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT11T324PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT11T330PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT11T332PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

Recommended Cutting Conditions → H28

Tool: WEZ11016ES02-10
Insert: AOET11T3_ _ PEER-F





For cutting conditions by work material, see page H28.
When using G type chipbreakers, set the efficiency to 80%.
The recommended cutting conditions may not be practical depending on the operating conditions (e. g. machine, work material shape, clamping system).

● = Euro stock
○ = Japan stock
❑ = On request
– =Not available
N·m Recommended Tightening Torque (N·m)

■ Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 11T302PEER-G	●		❑	●		❑	●	●	●	–	–	●	0,2	1
11T304PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
11T305PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
11T308PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
11T310PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
11T312PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
11T316PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
11T320PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
11T324PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
11T330PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	2
11T332PEER-G	●		❑	❑		❑	❑	●	●	–	–		3,2	2
AOMT 11T304PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
11T308PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
11T312PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
11T316PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,6	1
AOET 11T302PEER-F	●		–			–		–		–	–	–	0,2	1
11T304PEER-F	●		–			–		–		–	–	–	0,4	1
11T305PEER-F	●		–			–		–		–	–	–	0,5	1
11T308PEER-F	●		–			–		–		–	–	–	0,8	1
11T310PEER-F	●		–			–		–		–	–	–	1,0	1
11T312PEER-F	●		–			–		–		–	–	–	1,2	1
11T316PEER-F	●		–			–		–		–	–	–	1,6	1
11T320PEER-F	●		–			–		–		–	–	–	2,0	1
11T324PEER-F	●		–			–		–		–	–	–	2,4	1
11T330PEER-F	●		–			–		–		–	–	–	3,0	2
11T332PEER-F	●		–			–		–		–	–	–	3,2	2
AOET 11T302PEER-P16	●		–			–		–		–	–	–	0,2	1
11T304PEER-P16	●		–			–		–		–	–	–	0,4	1
11T305PEER-P16	●		–			–		–		–	–	–	0,5	1
11T308PEER-P16	●		–			–		–		–	–	–	0,8	1
11T310PEER-P16	●		–			–		–		–	–	–	1,0	1
11T312PEER-P16	●		–			–		–		–	–	–	1,2	1
11T302PEER-P20	●		–			–		–		–	–	–	0,2	1
11T304PEER-P20	●		–			–		–		–	–	–	0,4	1
11T305PEER-P20	●		–			–		–		–	–	–	0,5	1
11T308PEER-P20	●		–			–		–		–	–	–	0,8	1
11T310PEER-P20	●		–			–		–		–	–	–	1,0	1
11T312PEER-P20	●		–			–		–		–	–	–	1,2	1
11T302PEER-P25	●		–			–		–		–	–	–	0,2	1
11T304PEER-P25	●		–			–		–		–	–	–	0,4	1
11T305PEER-P25	●		–			–		–		–	–	–	0,5	1
11T308PEER-P25	●		–			–		–		–	–	–	0,8	1
11T310PEER-P25	●		–			–		–		–	–	–	1,0	1
11T312PEER-P25	●		–			–		–		–	–	–	1,2	1
AOET 11T302PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
11T304PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
11T305PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
11T308PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
11T310PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
11T312PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
11T316PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
11T320PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
11T324PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
11T330PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	2
11T332PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	2

Fig. 1

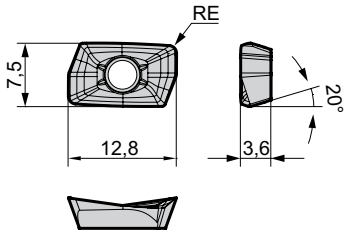
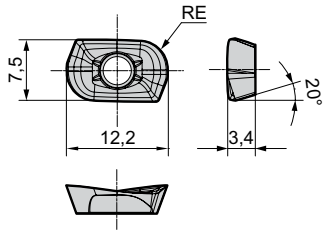


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P16 is applicable to cutter diameters Ø 14 mm and Ø 16 mm.
*P20 is applicable to cutter diameters Ø 18 mm, Ø 20 mm.
*P25 is applicable to cutter diameters Ø 25 mm, Ø 28 mm.

WEZ 11000 EL

Rake Angle	Radial	-7° – -18°
	Axial	6° – 15°

10 mm 90°

Fig. 1

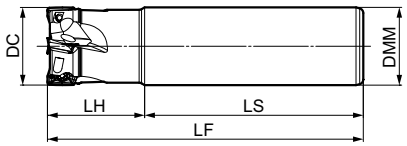
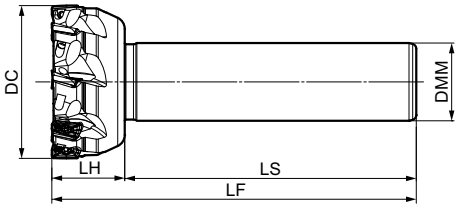


Fig. 2



Body - WEZ (Long Type)

Dimensions (mm)

Cat. No.	Stock	DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Fig.
WEZ 11014EL01	●	14	16	25	95	120	1	0,16	1
11016EL02	●	16	16	25	120	145	2	0,19	1
11016EL02-14	●	16	14	25	120	145	2	0,15	2
11018EL02	●	18	16	25	120	145	2	0,20	2
11020EL02	●	20	20	40	110	150	2	0,31	1
11020EL02-18	●	20	18	25	125	150	2	0,26	2
11022EL02	●	22	20	30	120	150	2	0,32	2
11025EL02	●	25	25	50	120	170	2	0,57	1
11025EL02-22	●	25	22	30	140	170	2	0,46	2
11025EL03	●	25	25	50	120	170	3	0,57	1
11028EL02	●	28	25	30	140	170	2	0,60	2
11030EL02	●	30	25	30	140	170	2	0,62	2
11032EL02	●	32	32	60	110	170	2	0,97	1
11032EL02-30	●	32	30	30	140	170	2	0,88	2
11032EL03	●	32	32	60	110	170	3	0,96	1
11035EL02	●	35	32	30	140	170	2	1,02	2
11035EL03	●	35	32	30	140	170	3	1,00	2
11040EL02	●	40	32	30	140	170	2	1,08	2
11050EL03	●	50	32	30	140	170	3	1,19	2

Inserts are sold separately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZ 11014EL01	BFTX0305IP	2,0	TRDR08IP
11016EL02(-14)		1,5	
11018EL02			
11020EL02(-18)	BFTX0306IP		
11022EL02			
11025EL02(-22)			
11025EL03			
11028EL02			
11030EL02			
11032EL02(-30)			
11032EL03			
11035EL02			
11035EL03			
11040EL02			
11050EL03			

Identification Details

WEZ	11	025	E	L	02	-	22
Cutter Series	Insert Size	Cutter Diameter	Round Shank	Long Type	Number of Teeth		Shank Diameter

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm
(AOMT11T324PEER)
Corner radius = 3,0 mm: C = 1 mm
(AOMT11T330PEER)
Corner radius = 3,2 mm: C = 1 mm
(AOMT11T332PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

Recommended Cutting Conditions

→ H28

● = Euro stock
○ = Japan stock
❑ = On request
▭ =Not available
N·m Recommended Tightening Torque (N·m)

■ Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 11T302PEER-G	●		❑	●		❑	●	●	●	–	–	●	0,2	1
11T304PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
11T305PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
11T308PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
11T310PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
11T312PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
11T316PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
11T320PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
11T324PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
11T330PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	2
11T332PEER-G	●		❑	❑		❑	❑	●	●	–	–		3,2	2
AOMT 11T304PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
11T308PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
11T312PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
11T316PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,6	1
AOET 11T302PEER-F	●		–			–		–		–	–	–	0,2	1
11T304PEER-F	●		–			–		–		–	–	–	0,4	1
11T305PEER-F	●		–			–		–		–	–	–	0,5	1
11T308PEER-F	●		–			–		–		–	–	–	0,8	1
11T310PEER-F	●		–			–		–		–	–	–	1,0	1
11T312PEER-F	●		–			–		–		–	–	–	1,2	1
11T316PEER-F	●		–			–		–		–	–	–	1,6	1
11T320PEER-F	●		–			–		–		–	–	–	2,0	1
11T324PEER-F	●		–			–		–		–	–	–	2,4	1
11T330PEER-F	●		–			–		–		–	–	–	3,0	2
11T332PEER-F	●		–			–		–		–	–	–	3,2	2
AOET 11T302PEER-P16	●		–			–		–		–	–	–	0,2	1
11T304PEER-P16	●		–			–		–		–	–	–	0,4	1
11T305PEER-P16	●		–			–		–		–	–	–	0,5	1
11T308PEER-P16	●		–			–		–		–	–	–	0,8	1
11T310PEER-P16	●		–			–		–		–	–	–	1,0	1
11T312PEER-P16	●		–			–		–		–	–	–	1,2	1
11T302PEER-P20	●		–			–		–		–	–	–	0,2	1
11T304PEER-P20	●		–			–		–		–	–	–	0,4	1
11T305PEER-P20	●		–			–		–		–	–	–	0,5	1
11T308PEER-P20	●		–			–		–		–	–	–	0,8	1
11T310PEER-P20	●		–			–		–		–	–	–	1,0	1
11T312PEER-P20	●		–			–		–		–	–	–	1,2	1
11T302PEER-P25	●		–			–		–		–	–	–	0,2	1
11T304PEER-P25	●		–			–		–		–	–	–	0,4	1
11T305PEER-P25	●		–			–		–		–	–	–	0,5	1
11T308PEER-P25	●		–			–		–		–	–	–	0,8	1
11T310PEER-P25	●		–			–		–		–	–	–	1,0	1
11T312PEER-P25	●		–			–		–		–	–	–	1,2	1
AOET 11T302PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
11T304PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
11T305PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
11T308PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
11T310PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
11T312PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
11T316PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
11T320PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
11T324PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
11T330PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	2
11T332PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	2

Fig. 1

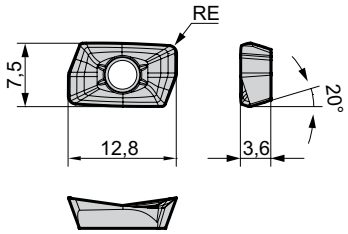
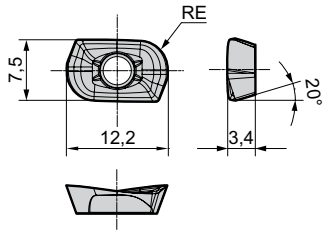


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P16 is applicable to cutter diameters Ø 14 mm and Ø 16 mm.
*P20 is applicable to cutter diameters Ø 18 mm, Ø 20 mm.
*P25 is applicable to cutter diameters Ø 25 mm, Ø 28 mm.

WEZ 17000 E

Rake Angle	Radial	-6° – -12°
	Axial	6° – 15°

15 mm 90°

Fig. 1

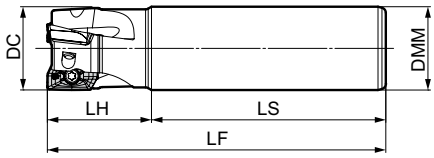
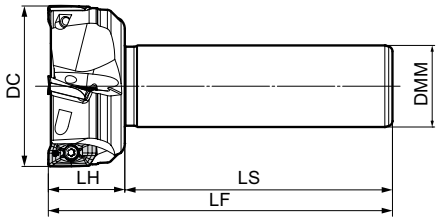


Fig. 2



Body - WEZ (Shank Type)

Dimensions (mm)

Cat. No.	Stock	DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Fig.
WEZ 17025E02	●	25	25	35	85	120	2	0,38	1
17025E02-20	●	25	20	35	85	120	2	0,25	2
17028E02	●	28	25	35	85	120	2	0,40	2
17030E03	●	30	25	40	90	130	3	0,43	2
17032E02	●	32	32	40	90	130	2	0,71	1
17032E03	●	32	32	40	90	130	3	0,69	1
17032E03-25	●	32	25	40	90	130	3	0,44	2
17035E03	●	35	32	40	90	130	3	0,72	2
17040E03	●	40	32	30	105	135	3	0,81	2
17040E04	●	40	32	30	105	135	4	0,79	2
17050E03	●	50	32	30	105	135	3	0,93	2
17050E03-42	●	50	42	30	105	135	3	1,41	2
17050E05	●	50	32	30	105	135	5	0,89	2
17050E05-42	●	50	42	30	105	135	5	1,37	2
17063E04	●	63	32	30	105	135	4	1,10	2
17063E04-42	●	63	42	30	105	135	4	1,58	2
17063E06	●	63	32	30	105	135	6	1,08	2
17063E06-42	●	63	42	30	105	135	6	1,56	2
17080E07	●	80	32	30	105	135	7	1,39	2

Inserts are sold separately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZ 17025E02(-20)	BFTX0407IP	3,0	TRDR15IP
17028E02			
17030E03			
17032E02	BFTX0409IP		
17032E03(-25)			
17035E03			
17040E03			
17040E04			
17050E03(-42)			
17050E05(-42)			
17063E04(-42)			
17063E06(-42)			
17080E07			

Identification Details

WEZ	17	032	E	02	-	30
Cutter Series	Insert Size	Cutter Diameter	Round Shank	Number of Teeth		Shank Diameter

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT170524PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT170530PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT170532PEER)
Corner radius = 4,0 mm: C = 2 mm (AOMT170540PEER)
Corner radius = 5,0 mm: C = 5 mm (AOMT170550PEER)
Corner radius = 6,4 mm: C = 5 mm (AOMT170564PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

Recommended Cutting Conditions

→ H28

● = Euro stock
○ = Japan stock
❑ = On request
▭ =Not available
N·m Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K S M	P K M		P	K		K	M S	M S	N	N			
Roughing	P K S M			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 170502PEER-L	●		–	❑		–	❑	●	●	–	–	❑	0,2	1
170504PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,4	1
170508PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,8	1
170512PEER-L	●		–	❑		–	❑	●	●	–	–		1,2	1
170516PEER-L	●		–	❑		–	❑	●	●	–	–		1,6	1
AOMT 170502PEER-G	●		❑	●		❑	●	●	●	–	–	❑	0,2	1
170504PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
170505PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
170508PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
170510PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
170512PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
170516PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
170520PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
170524PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
170530PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	1
170532PEER-G	●		❑	❑		❑	●	●	●	–	–		3,2	1
170540PEER-G	●		❑	●		❑	●	●	●	–	–		4,0	1
170550PEER-G	●		❑	●		❑	●	●	●	–	–		5,0	2
170564PEER-G	❑		❑	❑		❑	❑	●	●	–	–		6,4	2
AOMT 170504PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
170508PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
170512PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
170516PEER-H	●		❑	●		❑	❑	●	●	–	–	–	1,6	1
AOET 170502PEER-F	●		–			–		–		–	–	–	0,2	1
170504PEER-F	●		–			–		–		–	–	–	0,4	1
170505PEER-F	●		–			–		–		–	–	–	0,5	1
170508PEER-F	●		–			–		–		–	–	–	0,8	1
170510PEER-F	●		–			–		–		–	–	–	1,0	1
170512PEER-F	●		–			–		–		–	–	–	1,2	1
170516PEER-F	●		–			–		–		–	–	–	1,6	1
170520PEER-F	●		–			–		–		–	–	–	2,0	1
170524PEER-F	●		–			–		–		–	–	–	2,4	1
170530PEER-F	●		–			–		–		–	–	–	3,0	1
170532PEER-F	●		–			–		–		–	–	–	3,2	1
170540PEER-F	●		–			–		–		–	–	–	4,0	1
170550PEER-F	●		–			–		–		–	–	–	5,0	2
170564PEER-F	●		–			–		–		–	–	–	6,4	2
AOET 170502PEER-P25	●		–			–		–		–	–	–	0,2	1
170504PEER-P25	●		–			–		–		–	–	–	0,4	1
170505PEER-P25	●		–			–		–		–	–	–	0,5	1
170508PEER-P25	●		–			–		–		–	–	–	0,8	1
170510PEER-P25	●		–			–		–		–	–	–	1,0	1
170512PEER-P25	●		–			–		–		–	–	–	1,2	1
170502PEER-P32	●		–			–		–		–	–	–	0,2	1
170504PEER-P32	●		–			–		–		–	–	–	0,4	1
170505PEER-P32	●		–			–		–		–	–	–	0,5	1
170508PEER-P32	●		–			–		–		–	–	–	0,8	1
170510PEER-P32	●		–			–		–		–	–	–	1,0	1
170512PEER-P32	●		–			–		–		–	–	–	1,2	1
AOET 170502PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
170504PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
170505PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
170508PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
170510PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
170512PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
170516PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
170520PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
170524PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
170530PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	1
170532PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	1
170540PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	4,0	1
170550PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	5,0	2
170564PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	6,4	2

Fig. 1

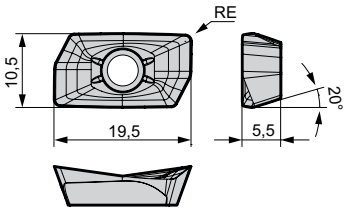
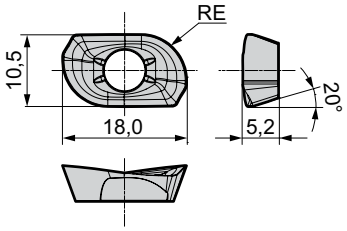


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P25 is applicable to cutter diameters Ø 25 mm and Ø 28 mm.
*P32 is applicable to cutter diameters Ø 30 mm, Ø 32 mm and Ø 35 mm.

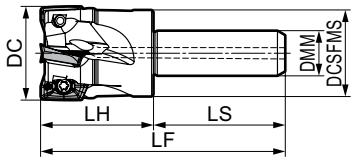
WEZ 17000 ES

Series for Multi-Tasking Machines

Rake Angle	Radial	-10° – -12°
	Axial	6° – 8°

15 mm 90°

Fig. 1



Body - WEZ (Short Shank Type)

Dimensions (mm)

Cat. No.	Stock	DC	DCSFMS	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Fig.
WEZ 17025ES02-16	❍	25	23	16	30	40	70	2	0,11	1
17032ES03-16	❍	32	27	16	30	40	70	3	0,14	1

Inserts are sold separately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZ 17025ES02-16	BFTX0407IP	3,0	TRDR15IP
17032ES03-16	BFTX0409IP		

Identification Details

WEZ	17	025	E	S	02	-	16
Cutter Series	Insert Size	Cutter Diameter	Round Shank	Short Shank	Number of Teeth		Shank Diameter

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

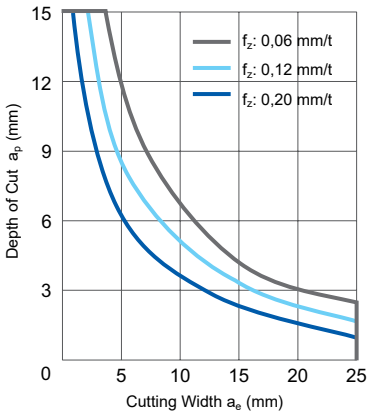
Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT170524PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT170530PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT170532PEER)
Corner radius = 4,0 mm: C = 2 mm (AOMT170540PEER)
Corner radius = 5,0 mm: C = 5 mm (AOMT170550PEER)
Corner radius = 6,4 mm: C = 5 mm (AOMT170564PEER)
Standard: R = 1 mm

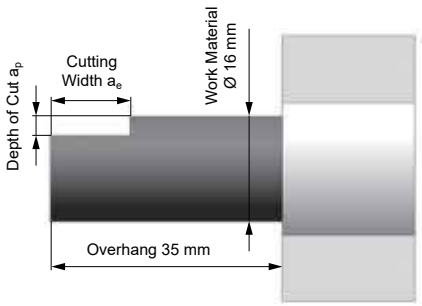
C: Chamfer
R: Radius

Recommended Cutting Conditions

→ H28

Tool: WEZ17025ES02-16
Insert: AOET1705_ _ PEER-F





For cutting conditions by work material, see page 8.
When using G type chipbreakers, set the efficiency to 80%.
The recommended cutting conditions may not be practical depending on the operating conditions (e. g. machine, work material shape, clamping system).

● = Euro stock
○ = Japan stock
❑ = On request
[–] =Not available
N·m Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 170502PEER-L	●		–	❑		–	❑	●	●	–	–	❑	0,2	1
170504PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,4	1
170508PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,8	1
170512PEER-L	●		–	❑		–	❑	●	●	–	–		1,2	1
170516PEER-L	●		–	❑		–	❑	●	●	–	–		1,6	1
AOMT 170502PEER-G	●		❑	●		❑	●	●	●	–	–	❑	0,2	1
170504PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
170505PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
170508PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
170510PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
170512PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
170516PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
170520PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
170524PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
170530PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	1
170532PEER-G	●		❑	❑		❑	●	●	●	–	–		3,2	1
170540PEER-G	●		❑	●		❑	●	●	●	–	–		4,0	1
170550PEER-G	●		❑	●		❑	●	●	●	–	–		5,0	2
170564PEER-G	❑		❑	❑		❑	❑	●	●	–	–		6,4	2
AOMT 170504PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
170508PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
170512PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
170516PEER-H	●		❑	●		❑	❑	●	●	–	–	–	1,6	1
AOET 170502PEER-F	●		–			–		–		–	–	–	0,2	1
170504PEER-F	●		–			–		–		–	–	–	0,4	1
170505PEER-F	●		–			–		–		–	–	–	0,5	1
170508PEER-F	●		–			–		–		–	–	–	0,8	1
170510PEER-F	●		–			–		–		–	–	–	1,0	1
170512PEER-F	●		–			–		–		–	–	–	1,2	1
170516PEER-F	●		–			–		–		–	–	–	1,6	1
170520PEER-F	●		–			–		–		–	–	–	2,0	1
170524PEER-F	●		–			–		–		–	–	–	2,4	1
170530PEER-F	●		–			–		–		–	–	–	3,0	1
170532PEER-F	●		–			–		–		–	–	–	3,2	1
170540PEER-F	●		–			–		–		–	–	–	4,0	1
170550PEER-F	●		–			–		–		–	–	–	5,0	2
170564PEER-F	●		–			–		–		–	–	–	6,4	2
AOET 170502PEER-P25	●		–			–		–		–	–	–	0,2	1
170504PEER-P25	●		–			–		–		–	–	–	0,4	1
170505PEER-P25	●		–			–		–		–	–	–	0,5	1
170508PEER-P25	●		–			–		–		–	–	–	0,8	1
170510PEER-P25	●		–			–		–		–	–	–	1,0	1
170512PEER-P25	●		–			–		–		–	–	–	1,2	1
170502PEER-P32	●		–			–		–		–	–	–	0,2	1
170504PEER-P32	●		–			–		–		–	–	–	0,4	1
170505PEER-P32	●		–			–		–		–	–	–	0,5	1
170508PEER-P32	●		–			–		–		–	–	–	0,8	1
170510PEER-P32	●		–			–		–		–	–	–	1,0	1
170512PEER-P32	●		–			–		–		–	–	–	1,2	1
AOET 170502PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
170504PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
170505PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
170508PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
170510PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
170512PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
170516PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
170520PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
170524PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
170530PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	1
170532PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	1
170540PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	4,0	1
170550PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	5,0	2
170564PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	6,4	2

Fig. 1

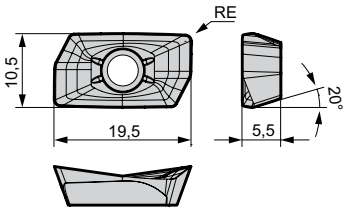
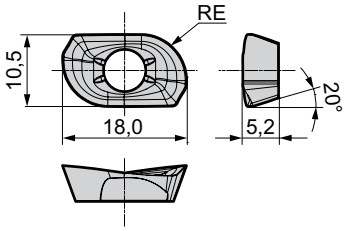


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P25 is applicable to cutter diameters Ø 25 mm and Ø 28 mm.
*P32 is applicable to cutter diameters Ø 30 mm, Ø 32 mm and Ø 35 mm.

WEZ 17000 EL

Rake Angle	Radial	-6° – -12°
	Axial	6° – 15°

15 mm 90°

Fig. 1

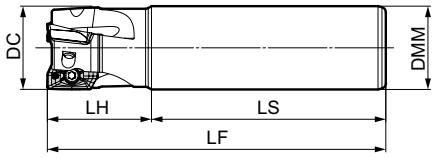
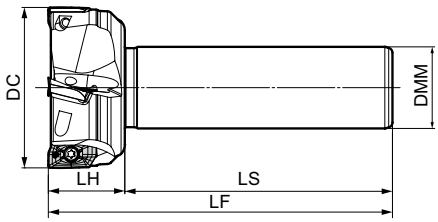


Fig. 2



Body - WEZ (Long Type)

Dimensions (mm)

Cat. No.	Stock	DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)	Fig.
WEZ 17025EL02	●	25	25	50	120	170	2	0,55	1
17028EL02	●	28	25	50	120	170	2	0,57	2
17030EL02	●	30	25	50	120	170	2	0,59	2
17032EL02	●	32	32	60	110	170	2	0,94	1
17032EL02-30	●	32	30	50	120	170	2	0,85	2
17032EL03	●	32	32	60	110	170	3	0,92	1
17035EL02	●	35	32	50	120	170	2	0,98	2
17040EL02	●	40	32	50	120	170	2	1,09	2
17040EL03	●	40	32	50	120	170	3	1,08	2
17040EL04	●	40	32	50	120	170	4	1,05	2
17050EL03	●	50	32	50	120	170	3	1,29	2
17050EL03-42	●	50	42	50	120	170	3	1,83	2
17050EL05	●	50	32	50	120	170	5	1,25	2
17050EL05-42	●	50	42	50	120	170	5	1,79	2
17063EL04	●	63	32	50	120	170	4	1,61	2
17063EL04-42	●	63	42	50	120	170	4	2,16	2
17063EL06	●	63	32	50	120	170	6	1,58	2
17063EL06-42	●	63	42	50	120	170	6	2,13	2

Inserts are sold separately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZ 17025EL02	BFTX0407IP	3,0	TRDR15IP
17028EL02			
17030EL02			
17032EL02(-30)	BFTX0409IP		
17032EL03			
17035EL02			
17040EL02			
17040EL03			
17040EL04			
17050EL03(-42)			
17050EL05(-42)			
17063EL04(-42)			
17063EL06(-42)			

Recommended Cutting Conditions

→ H28

Identification Details

WEZ	17	032	E	L	02	-	30
Cutter Series	Insert Size	Cutter Diameter	Round Shank	Long Type	Number of Teeth		Shank Diameter

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT170524PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT170530PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT170532PEER)
Corner radius = 4,0 mm: C = 2 mm (AOMT170540PEER)
Corner radius = 5,0 mm: C = 5 mm (AOMT170550PEER)
Corner radius = 6,4 mm: C = 5 mm (AOMT170564PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
○ = Japan stock
❑ = On request
⊟ =Not available
N·m Recommended Tightening Torque (N·m)

Expansion

Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K S M	P K M		P	K		K	M S	M S	N	N			
Roughing	P K S M			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 170502PEER-L	●		–	❑		–	❑	●	●	–	–	❑	0,2	1
170504PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,4	1
170508PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,8	1
170512PEER-L	●		–	❑		–	❑	●	●	–	–		1,2	1
170516PEER-L	●		–	❑		–	❑	●	●	–	–		1,6	1
AOMT 170502PEER-G	●		❑	●		❑	●	●	●	–	–	❑	0,2	1
170504PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
170505PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
170508PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
170510PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
170512PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
170516PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
170520PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
170524PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
170530PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	1
170532PEER-G	●		❑	❑		❑	●	●	●	–	–		3,2	1
170540PEER-G	●		❑	●		❑	●	●	●	–	–		4,0	1
170550PEER-G	●		❑	●		❑	●	●	●	–	–		5,0	2
170564PEER-G	❑		❑	❑		❑	❑	●	●	–	–		6,4	2
AOMT 170504PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
170508PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
170512PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
170516PEER-H	●		❑	●		❑	❑	●	●	–	–	–	1,6	1
AOET 170502PEER-F	●		–			–		–		–	–	–	0,2	1
170504PEER-F	●		–			–		–		–	–	–	0,4	1
170505PEER-F	●		–			–		–		–	–	–	0,5	1
170508PEER-F	●		–			–		–		–	–	–	0,8	1
170510PEER-F	●		–			–		–		–	–	–	1,0	1
170512PEER-F	●		–			–		–		–	–	–	1,2	1
170516PEER-F	●		–			–		–		–	–	–	1,6	1
170520PEER-F	●		–			–		–		–	–	–	2,0	1
170524PEER-F	●		–			–		–		–	–	–	2,4	1
170530PEER-F	●		–			–		–		–	–	–	3,0	1
170532PEER-F	●		–			–		–		–	–	–	3,2	1
170540PEER-F	●		–			–		–		–	–	–	4,0	1
170550PEER-F	●		–			–		–		–	–	–	5,0	2
170564PEER-F	●		–			–		–		–	–	–	6,4	2
AOET 170502PEER-P25	●		–			–		–		–	–	–	0,2	1
170504PEER-P25	●		–			–		–		–	–	–	0,4	1
170505PEER-P25	●		–			–		–		–	–	–	0,5	1
170508PEER-P25	●		–			–		–		–	–	–	0,8	1
170510PEER-P25	●		–			–		–		–	–	–	1,0	1
170512PEER-P25	●		–			–		–		–	–	–	1,2	1
170502PEER-P32	●		–			–		–		–	–	–	0,2	1
170504PEER-P32	●		–			–		–		–	–	–	0,4	1
170505PEER-P32	●		–			–		–		–	–	–	0,5	1
170508PEER-P32	●		–			–		–		–	–	–	0,8	1
170510PEER-P32	●		–			–		–		–	–	–	1,0	1
170512PEER-P32	●		–			–		–		–	–	–	1,2	1
AOET 170502PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
170504PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
170505PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
170508PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
170510PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
170512PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
170516PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
170520PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
170524PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
170530PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	1
170532PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	1
170540PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	4,0	1
170550PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	5,0	2
170564PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	6,4	2

Fig. 1

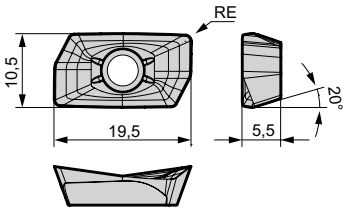
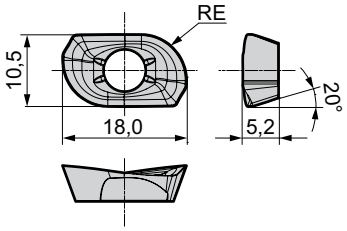


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P25 is applicable to cutter diameters Ø 25 mm and Ø 28 mm.
*P32 is applicable to cutter diameters Ø 30 mm, Ø 32 mm and Ø 35 mm.

WEZR 11000 E

New

Repeater Type

Rake Angle	Radial	-15° – -11°
	Axial	8° – 14°

19–61 mm 90°

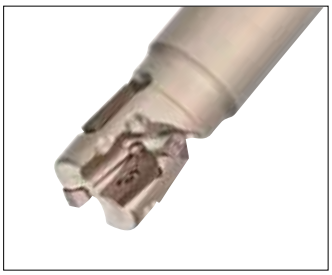


Fig. 1

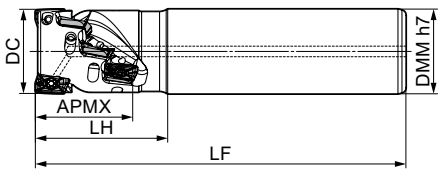
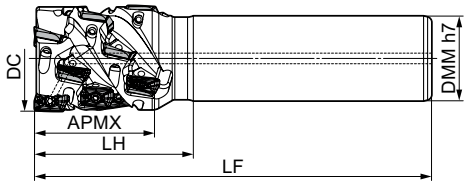


Fig. 2



Body (Shank Type)

Dimensions (mm)

Cat. No.	Stock	DC	APMX	DMM	LH	LF	Total No. of Teeth	Steps	Effective No. of Teeth	Weight (kg)	Fig.
WEZR 11020E1920Z02	❍	20	19	20	30	110	4	2	2	0,22	1
11020E3620Z01	❍	20	36	20	45	125	4	4	1	0,24	1
11025E2725Z02	❍	25	27	25	40	130	6	3	2	0,41	1
11025E3625Z02	❍	25	36	25	50	140	8	4	2	0,42	1
11030E5325Z02	❍	30	53	25	65	155	12	6	2	0,52	2
11032E3632Z02	❍	32	36	32	50	140	8	4	2	0,74	1
11032E3632Z03	❍	32	36	32	50	140	12	4	3	0,71	1
11032E5332Z02	❍	32	53	32	70	160	12	6	2	0,90	1
11035E5332Z03	❍	35	53	32	65	155	18	6	3	0,88	2
11040E4432Z03	❍	40	44	32	60	150	15	5	3	0,87	2
11040E4432Z04	❍	40	44	32	60	150	20	5	4	0,85	2
11040E6132Z03	❍	40	61	32	75	165	21	7	3	0,95	2

Inserts are sold seperately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZR 11_ _ _	BFTX0306IP	1,5	TRDR08IP

Identification Details

WEZR	11	032	E	36	32	Z02
Cutter Series	Insert Size	Cutter Diameter	Shank Type	Max. Depth of Cut	Shank Dia-meter	Effective Number of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Chipbreaker	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grades
P	Carbon Steel	≤ 280HB	G	100–**150**–200	0,08–**0,12**–0,20	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80–**100**–120	0,08–**0,12**–0,20	
	Alloy Steel	≤ 280HB	G	100–**150**–80	0,08–**0,12**–0,20	
M	Stainless Steel	≤ 280HB	G	80–**120**–160	0,08–**0,12**–0,20	ACU2500 ACM200 ACM300
K	Cast Iron Ductile Cast Iron	–	G	100–**150**–200	0,08–**0,12**–0,20	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	–	G	40–**50**–60	0,08–**0,12**–0,20	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12,6%	S	300–**500**–800	0,05–**0,10**–0,15	DL2000 H20
		Si >12,6%	S	100–**200**–250	0,05–**0,10**–0,15	

Min. - **Optimum** - Max.

Note:
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT11T324PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT11T330PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT11T332PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
○ = Japan stock
❑ = On request
[–] =Not available
N·m Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	K P S	P K M		P	K		K	M S	M S	N	N			
Roughing	K P S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 11T302PEER-G	●		❑	●		❑	●	●	●	–	–	●	0,2	1
11T304PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
11T305PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
11T308PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
11T310PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
11T312PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
11T316PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
11T320PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
11T324PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
11T330PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	2
11T332PEER-G	●		❑	❑		❑	❑	●	●	–	–		3,2	2
AOMT 11T304PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
11T308PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
11T312PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
11T316PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,6	1
AOET 11T302PEER-F	●		–			–		–		–	–	–	0,2	1
11T304PEER-F	●		–			–		–		–	–	–	0,4	1
11T305PEER-F	●		–			–		–		–	–	–	0,5	1
11T308PEER-F	●		–			–		–		–	–	–	0,8	1
11T310PEER-F	●		–			–		–		–	–	–	1,0	1
11T312PEER-F	●		–			–		–		–	–	–	1,2	1
11T316PEER-F	●		–			–		–		–	–	–	1,6	1
11T320PEER-F	●		–			–		–		–	–	–	2,0	1
11T324PEER-F	●		–			–		–		–	–	–	2,4	1
11T330PEER-F	●		–			–		–		–	–	–	3,0	2
11T332PEER-F	●		–			–		–		–	–	–	3,2	2
AOET 11T302PEER-P20	●		–			–		–		–	–	–	0,2	1
11T304PEER-P20	●		–			–		–		–	–	–	0,4	1
11T305PEER-P20	●		–			–		–		–	–	–	0,5	1
11T308PEER-P20	●		–			–		–		–	–	–	0,8	1
11T310PEER-P20	●		–			–		–		–	–	–	1,0	1
11T312PEER-P20	●		–			–		–		–	–	–	1,2	1
11T302PEER-P25	●		–			–		–		–	–	–	0,2	1
11T304PEER-P25	●		–			–		–		–	–	–	0,4	1
11T305PEER-P25	●		–			–		–		–	–	–	0,5	1
11T308PEER-P25	●		–			–		–		–	–	–	0,8	1
11T310PEER-P25	●		–			–		–		–	–	–	1,0	1
11T312PEER-P25	●		–			–		–		–	–	–	1,2	1
AOET 11T302PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
11T304PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
11T305PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
11T308PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
11T310PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
11T312PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
11T316PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
11T320PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
11T324PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
11T330PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	2
11T332PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	2

Fig. 1

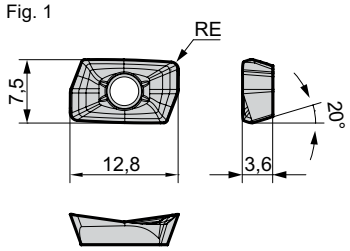
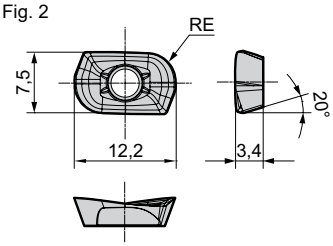


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P20 is applicable to cutter diameters Ø 18 mm, Ø 20 mm.
*P25 is applicable to cutter diameters Ø 25 mm, Ø 28 mm.

Use peripheral inserts with RE ≤ 0,8 mm from the second step and above.

WEZR 17000 E

New

Repeater Type

Rake Angle	Radial	-9° – -8°
	Axial	10° – 12°

29–84 mm 90°

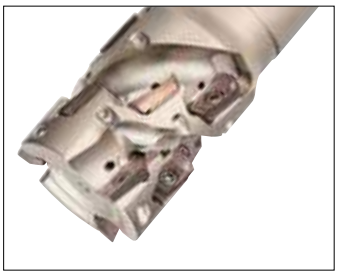
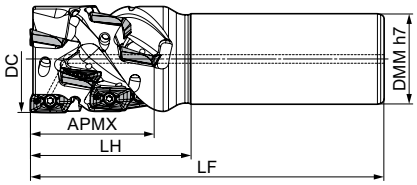


Fig. 1



Body (Shank Type)

Dimensions (mm)

Cat. No.	Stock	DC	APMX	DMM	LH	LF	Total No. of Teeth	Steps	Effective No. of Teeth	Weight (kg)	Fig.
WEZR 17040E2932Z03	❍	40	29	32	45	110	6	3	2	0,75	1
17040E4332Z02	❍	40	43	32	60	125	6	2	3	0,86	1
17050E5742Z03	❍	50	57	42	75	130	12	3	4	1,58	1
17050E8442Z02	❍	50	84	42	105	140	12	2	6	1,04	1

Inserts are sold seperately.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZR 17_ _ _	BFTX0409IP	3,0	TRDR15IP

Identification Details

WEZR	17	040	E	29	32	Z03
Cutter Series	Insert Size	Cutter Diameter	Shank Type	Max. Depth of Cut	Shank Dia-meter	Effective Number of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Chipbreaker	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grades
P	Carbon Steel	≤ 280HB	G	100–**150**–200	0,10–**0,20**–0,30	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80–**100**–120	0,10–**0,20**–0,30	
	Alloy Steel	≤ 280HB	G	100–**150**–80	0,10–**0,20**–0,30	
M	Stainless Steel	≤ 280HB	G	80–**120**–160	0,10–**0,20**–0,30	ACU2500 ACM200 ACM300
K	Cast Iron Ductile Cast Iron	–	G	100–**150**–200	0,10–**0,20**–0,30	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	–	G	40–**50**–60	0,10–**0,20**–0,30	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12,6%	S	300–**500**–800	0,05–**0,10**–0,15	DL2000 H20
		Si >12,6%	S	100–**200**–250	0,05–**0,10**–0,15	

Min. - **Optimum** - Max.

Note:
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT170524PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT170530PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT170532PEER)
Corner radius = 4,0 mm: C = 2 mm (AOMT170540PEER)
Corner radius = 5,0 mm: C = 5 mm (AOMT170550PEER)
Corner radius = 6,4 mm: C = 5 mm (AOMT170564PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
○ = Japan stock
❑ = On request
– =Not available
N·m Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 170502PEER-L	●		–	❑		–	❑	●	●	–	–	❑	0,2	1
170504PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,4	1
170508PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,8	1
170512PEER-L	●		–	❑		–	❑	●	●	–	–		1,2	1
170516PEER-L	●		–	❑		–	❑	●	●	–	–		1,6	1
AOMT 170502PEER-G	●		❑	●		❑	●	●	●	–	–	❑	0,2	1
170504PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
170505PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
170508PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
170510PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
170512PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
170516PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
170520PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
170524PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
170530PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	1
170532PEER-G	●		❑	❑		❑	●	●	●	–	–		3,2	1
170540PEER-G	●		❑	●		❑	●	●	●	–	–		4,0	1
170550PEER-G	●		❑	●		❑	●	●	●	–	–		5,0	2
170564PEER-G	❑		❑	❑		❑	❑	●	●	–	–		6,4	2
AOMT 170504PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
170508PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
170512PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
170516PEER-H	●		❑	●		❑	❑	●	●	–	–	–	1,6	1
AOET 170502PEER-F	●		–			–		–		–	–	–	0,2	1
170504PEER-F	●		–			–		–		–	–	–	0,4	1
170505PEER-F	●		–			–		–		–	–	–	0,5	1
170508PEER-F	●		–			–		–		–	–	–	0,8	1
170510PEER-F	●		–			–		–		–	–	–	1,0	1
170512PEER-F	●		–			–		–		–	–	–	1,2	1
170516PEER-F	●		–			–		–		–	–	–	1,6	1
170520PEER-F	●		–			–		–		–	–	–	2,0	1
170524PEER-F	●		–			–		–		–	–	–	2,4	1
170530PEER-F	●		–			–		–		–	–	–	3,0	1
170532PEER-F	●		–			–		–		–	–	–	3,2	1
170540PEER-F	●		–			–		–		–	–	–	4,0	1
170550PEER-F	●		–			–		–		–	–	–	5,0	2
170564PEER-F	●		–			–		–		–	–	–	6,4	2
AOET 170502PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
170504PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
170505PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
170508PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
170510PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
170512PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
170516PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
170520PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
170524PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
170530PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	1
170532PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	1
170540PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	4,0	1
170550PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	5,0	2
170564PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	6,4	2

Fig. 1

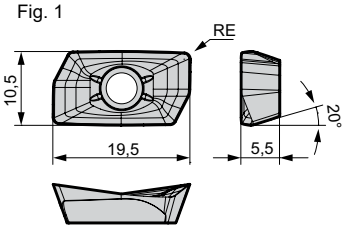
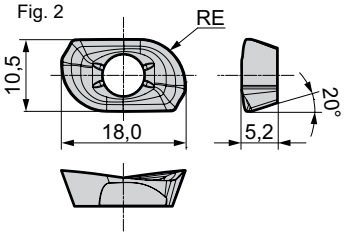


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

Use peripheral inserts with RE ≤ 0,8 mm from the second step and above.

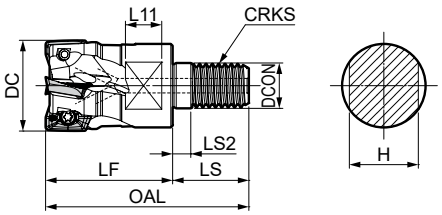
WEZ 11000 M

Modular Type

Rake Angle		
	Radial	-7° – -18°
	Axial	6° – 15°

10 mm 90°

Fig. 1



Head

Dimensions (mm)

Cat. No.	Stock	DC	DCON	CRKS	OAL	LF	LS2	L11	H	No. of Teeth	Weight (kg)	Fig.
WEZ 11016M08Z2	●	16	8,5	M8	42	25	5	8	13	2	0,03	1
11018M08Z2	●	18	8,5	M8	42	25	5	8	13	2	0,03	1
11020M10Z2	●	20	10,5	M10	49	30	5	8	15	2	0,06	1
11020M10Z3	●	20	10,5	M10	49	30	5	8	15	3	0,05	1
11022M10Z3	●	22	10,5	M10	49	30	5	8	15	3	0,06	1
11025M12Z2	●	25	12,5	M12	56	35	5	10	19	2	0,11	1
11025M12Z3	●	25	12,5	M12	56	35	5	10	19	3	0,10	1
11025M12Z4	●	25	12,5	M12	56	35	5	10	19	4	0,10	1
11026M12Z4	●	26	12,5	M12	56	35	5	10	19	4	0,10	1
11026M12Z5	●	26	12,5	M12	56	35	5	10	19	5	0,09	1
11028M12Z4	●	28	12,5	M12	56	35	5	10	19	4	0,11	1
11028M12Z5	●	28	12,5	M12	56	35	5	10	19	5	0,10	1
11030M16Z2	●	30	17	M16	63	40	5	10	24	2	0,20	1
11030M16Z4	●	30	17	M16	63	40	5	10	24	4	0,19	1
11030M16Z5	●	30	17	M16	63	40	5	10	24	5	0,17	1
11032M16Z2	●	32	17	M16	63	40	5	10	24	2	0,22	1
11032M16Z3	●	32	17	M16	63	40	5	10	24	3	0,20	1
11032M16Z4	●	32	17	M16	63	40	5	10	24	4	0,20	1
11032M16Z5	●	32	17	M16	63	40	5	10	24	5	0,19	1
11035M16Z2	●	35	17	M16	63	40	5	10	24	2	0,24	1
11035M16Z5	●	35	17	M16	63	40	5	10	24	5	0,22	1
11040M16Z2	●	40	17	M16	63	40	5	10	24	2	0,28	1
11040M16Z4	●	40	17	M16	63	40	5	10	24	4	0,26	1
11040M16Z5	●	40	17	M16	63	40	5	10	24	5	0,26	1
11040M16Z6	●	40	17	M16	63	40	5	10	24	6	0,25	1

Inserts are sold separately. Arbor → H5.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZ 11016M08Z2	BFTX0305IP	1,5	TRDR08IP
11018M08Z2			
11020M10Z2–11040M16Z2	BFTX0306IP		

Recommended Cutting Conditions

→ H. 28

Identification Details

WEZ	11	016	M 08	Z2
Cutter Series	Insert Size	Cutter Diameter	Mounting Screw Size	Number of Teeth

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT11T324PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT11T330PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT11T332PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
○ = Japan stock
❑ = On request
[–] =Not available
N·m Recommended Tightening Torque (N·m)

■ Inserts

Precautions for Mounting ⟶ H. 29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 11T302PEER-G	●		❑	●		❑	●	●	●	–	–	●	0,2	1
11T304PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
11T305PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
11T308PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
11T310PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
11T312PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
11T316PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
11T320PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
11T324PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
11T330PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	2
11T332PEER-G	●		❑	❑		❑	❑	●	●	–	–		3,2	2
AOMT 11T304PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
11T308PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
11T312PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
11T316PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,6	1
AOET 11T302PEER-F	●		–			–		–		–	–	–	0,2	1
11T304PEER-F	●		–			–		–		–	–	–	0,4	1
11T305PEER-F	●		–			–		–		–	–	–	0,5	1
11T308PEER-F	●		–			–		–		–	–	–	0,8	1
11T310PEER-F	●		–			–		–		–	–	–	1,0	1
11T312PEER-F	●		–			–		–		–	–	–	1,2	1
11T316PEER-F	●		–			–		–		–	–	–	1,6	1
11T320PEER-F	●		–			–		–		–	–	–	2,0	1
11T324PEER-F	●		–			–		–		–	–	–	2,4	1
11T330PEER-F	●		–			–		–		–	–	–	3,0	2
11T332PEER-F	●		–			–		–		–	–	–	3,2	2
AOET 11T302PEER-P16	●		–			–		–		–	–	–	0,2	1
11T304PEER-P16	●		–			–		–		–	–	–	0,4	1
11T305PEER-P16	●		–			–		–		–	–	–	0,5	1
11T308PEER-P16	●		–			–		–		–	–	–	0,8	1
11T310PEER-P16	●		–			–		–		–	–	–	1,0	1
11T312PEER-P16	●		–			–		–		–	–	–	1,2	1
11T302PEER-P20	●		–			–		–		–	–	–	0,2	1
11T304PEER-P20	●		–			–		–		–	–	–	0,4	1
11T305PEER-P20	●		–			–		–		–	–	–	0,5	1
11T308PEER-P20	●		–			–		–		–	–	–	0,8	1
11T310PEER-P20	●		–			–		–		–	–	–	1,0	1
11T312PEER-P20	●		–			–		–		–	–	–	1,2	1
11T302PEER-P25	●		–			–		–		–	–	–	0,2	1
11T304PEER-P25	●		–			–		–		–	–	–	0,4	1
11T305PEER-P25	●		–			–		–		–	–	–	0,5	1
11T308PEER-P25	●		–			–		–		–	–	–	0,8	1
11T310PEER-P25	●		–			–		–		–	–	–	1,0	1
11T312PEER-P25	●		–			–		–		–	–	–	1,2	1
AOET 11T302PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
11T304PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
11T305PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
11T308PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
11T310PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
11T312PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
11T316PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
11T320PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
11T324PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
11T330PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	2
11T332PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	2

Fig. 1

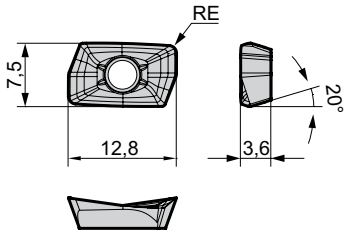
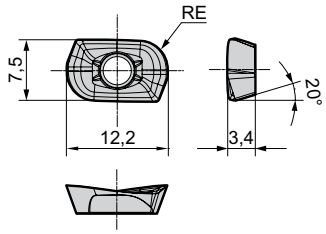


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P16 is applicable to cutter diameters Ø 14 mm and Ø 16 mm.
*P20 is applicable to cutter diameters Ø 18 mm, Ø 20 mm.
*P25 is applicable to cutter diameters Ø 25 mm, Ø 28 mm.

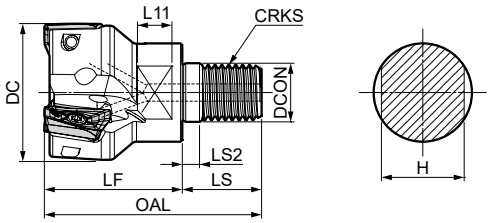
WEZ 17000 M

Modular Type

Rake Angle		
Radial	-6° – -12°	
Axial	6° – 15°	

15 mm 90°

Fig. 1



Head

Dimensions (mm)

Cat. No.	Stock	DC	DCON	CRKS	OAL	LF	LS2	L11	H	No. of Teeth	Weight (kg)	Fig.
WEZ 17025M012Z2	●	25	12,5	M12	56	35	5	10	19	2	0,08	1
17025M012Z3	●	25	12,5	M12	56	35	5	10	19	3	0,07	1
17028M012Z2	●	28	12,5	M12	56	35	5	10	19	2	0,10	1
17030M016Z2	●	30	17	M16	63	40	5	10	24	2	0,17	1
17030M016Z3	●	30	17	M16	63	40	5	10	24	3	0,15	1
17032M016Z2	●	32	17	M16	63	40	5	10	24	2	0,19	1
17032M016Z3	●	32	17	M16	63	40	5	10	24	3	0,16	1
17032M016Z4	●	32	17	M16	63	40	5	10	24	4	0,14	1
17035M016Z2	●	35	17	M16	63	40	5	10	24	2	0,21	1
17035M016Z3	●	35	17	M16	63	40	5	10	24	3	0,19	1
17040M016Z2	●	40	17	M16	63	40	5	10	24	2	0,15	1
17040M016Z3	●	40	17	M16	63	40	5	10	24	3	0,23	1
17040M016Z4	●	40	17	M16	63	40	5	10	24	4	0,21	1

Inserts are sold separately. Arbor → H5.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZ 17025M12Z2–17030M16Z3	BFTX0407IP	3,0	TRDR15IP
17032M16Z2–17040M16Z4	BFTX0409IP		

Identification Details

WEZ	17	025	M 12	Z2
Cutter Series	Insert Size	Cutter Diameter	Mounting Screw Size	Number of Teeth

Recommended Cutting Conditions

→ H. 28

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT170524PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT170530PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT170532PEER)
Corner radius = 4,0 mm: C = 2 mm (AOMT170540PEER)
Corner radius = 5,0 mm: C = 5 mm (AOMT170550PEER)
Corner radius = 6,4 mm: C = 5 mm (AOMT170564PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
○ = Japan stock
❑ = On request
▭ =Not available
N·m Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 170502PEER-L	●		–	❑		–	❑	●	●	–	–	❑	0,2	1
170504PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,4	1
170508PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,8	1
170512PEER-L	●		–	❑		–	❑	●	●	–	–		1,2	1
170516PEER-L	●		–	❑		–	❑	●	●	–	–		1,6	1
AOMT 170502PEER-G	●		❑	●		❑	●	●	●	–	–	❑	0,2	1
170504PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
170505PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
170508PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
170510PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
170512PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
170516PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
170520PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
170524PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
170530PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	1
170532PEER-G	●		❑	❑		❑	●	●	●	–	–		3,2	1
170540PEER-G	●		❑	●		❑	●	●	●	–	–		4,0	1
170550PEER-G	●		❑	●		❑	●	●	●	–	–		5,0	2
170564PEER-G	❑		❑	❑		❑	❑	●	●	–	–		6,4	2
AOMT 170504PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
170508PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
170512PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
170516PEER-H	●		❑	●		❑	❑	●	●	–	–	–	1,6	1
AOET 170502PEER-F	●		–			–		–		–	–	–	0,2	1
170504PEER-F	●		–			–		–		–	–	–	0,4	1
170505PEER-F	●		–			–		–		–	–	–	0,5	1
170508PEER-F	●		–			–		–		–	–	–	0,8	1
170510PEER-F	●		–			–		–		–	–	–	1,0	1
170512PEER-F	●		–			–		–		–	–	–	1,2	1
170516PEER-F	●		–			–		–		–	–	–	1,6	1
170520PEER-F	●		–			–		–		–	–	–	2,0	1
170524PEER-F	●		–			–		–		–	–	–	2,4	1
170530PEER-F	●		–			–		–		–	–	–	3,0	1
170532PEER-F	●		–			–		–		–	–	–	3,2	1
170540PEER-F	●		–			–		–		–	–	–	4,0	1
170550PEER-F	●		–			–		–		–	–	–	5,0	2
170564PEER-F	●		–			–		–		–	–	–	6,4	2
AOET 170502PEER-P25	●		–			–		–		–	–	–	0,2	1
170504PEER-P25	●		–			–		–		–	–	–	0,4	1
170505PEER-P25	●		–			–		–		–	–	–	0,5	1
170508PEER-P25	●		–			–		–		–	–	–	0,8	1
170510PEER-P25	●		–			–		–		–	–	–	1,0	1
170512PEER-P25	●		–			–		–		–	–	–	1,2	1
170502PEER-P32	●		–			–		–		–	–	–	0,2	1
170504PEER-P32	●		–			–		–		–	–	–	0,4	1
170505PEER-P32	●		–			–		–		–	–	–	0,5	1
170508PEER-P32	●		–			–		–		–	–	–	0,8	1
170510PEER-P32	●		–			–		–		–	–	–	1,0	1
170512PEER-P32	●		–			–		–		–	–	–	1,2	1
AOET 170502PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
170504PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
170505PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
170508PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
170510PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
170512PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
170516PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
170520PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
170524PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
170530PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	1
170532PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	1
170540PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	4,0	1
170550PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	5,0	2
170564PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	6,4	2

Fig. 1

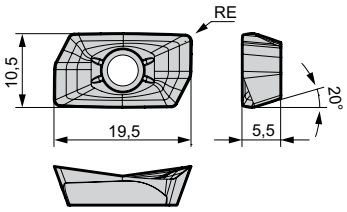
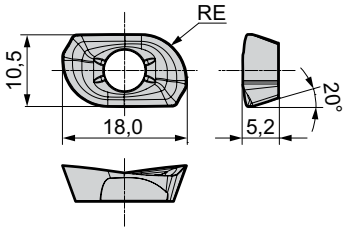


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

*P25 is applicable to cutter diameters Ø 25 mm and Ø 28 mm.
*P32 is applicable to cutter diameters Ø 30 mm, Ø 32 mm and Ø 35 mm.

"Wave Mill" Series
WEZR 11000 M

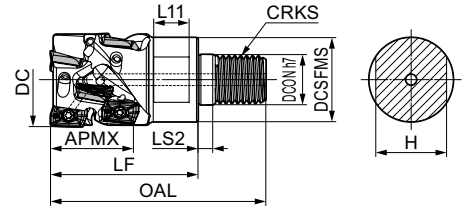
New

Repeater, Modular Type

Rake Angle	Radial	-12°
	Axial	11°

27 mm 90°

Fig. 1



Head

Dimensions (mm)

Cat. No.	Stock	DC	APMX	DCSFMS	DCON	CRKS	OAL	LF	LS2	L11	H	Total No. of Teeth	Steps	Effective No. of Teeth	Weight (kg)	Fig.
WEZR 11032M1627Z3	❍	32	27	28,5	17	M16	73	50	5	12	24	9	3	3	0,21	1

Inserts are sold separately. Arbor → H5.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZR 11_ _ _	BFTX0306IP	1,5	TRDR08IP

Identification Details

WEZR	11	032	M16	27	Z3
Cutter Series	Insert Size	Cutter Diameter	Mounting Screw Size	Max. Depth of Cut	Effective Number of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Chipbreaker	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grades
P	Carbon Steel	≤ 280HB	G	100–**150**–200	0,08–**0,12**–0,20	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80–**100**–120	0,08–**0,12**–0,20	
	Alloy Steel	≤ 280HB	G	100–**150**–80	0,08–**0,12**–0,20	
M	Stainless Steel	≤ 280HB	G	80–**120**–160	0,08–**0,12**–0,20	ACU2500 ACM200 ACM300
K	Cast Iron Ductile Cast Iron	–	G	100–**150**–200	0,08–**0,12**–0,20	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	–	G	40–**50**–60	0,08–**0,12**–0,20	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12,6%	S	300–**500**–800	0,05–**0,10**–0,15	DL2000 H20
		Si >12,6%	S	100–**200**–250	0,05–**0,10**–0,15	

Min. - **Optimum** - Max.

Note:
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT11T324PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT11T330PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT11T332PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
○ = Japan stock
❑ = On request
[–] =Not available
N·m Recommended Tightening Torque (N·m)

■ Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 11T302PEER-G	●		❑	●		❑	●	●	●	–	–	●	0,2	1
11T304PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
11T305PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
11T308PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
11T310PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
11T312PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
11T316PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
11T320PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
11T324PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
11T330PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	2
11T332PEER-G	●		❑	❑		❑	❑	●	●	–	–		3,2	2
AOMT 11T304PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
11T308PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
11T312PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
11T316PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,6	1
AOET 11T302PEER-F	●		–			–		–		–	–	–	0,2	1
11T304PEER-F	●		–			–		–		–	–	–	0,4	1
11T305PEER-F	●		–			–		–		–	–	–	0,5	1
11T308PEER-F	●		–			–		–		–	–	–	0,8	1
11T310PEER-F	●		–			–		–		–	–	–	1,0	1
11T312PEER-F	●		–			–		–		–	–	–	1,2	1
11T316PEER-F	●		–			–		–		–	–	–	1,6	1
11T320PEER-F	●		–			–		–		–	–	–	2,0	1
11T324PEER-F	●		–			–		–		–	–	–	2,4	1
11T330PEER-F	●		–			–		–		–	–	–	3,0	2
11T332PEER-F	●		–			–		–		–	–	–	3,2	2
AOET 11T302PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
11T304PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
11T305PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
11T308PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
11T310PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
11T312PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
11T316PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
11T320PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
11T324PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
11T330PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	2
11T332PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	2

Fig. 1

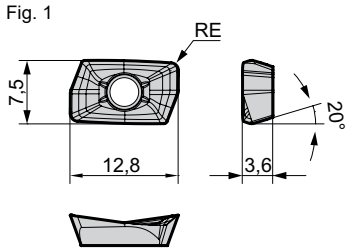
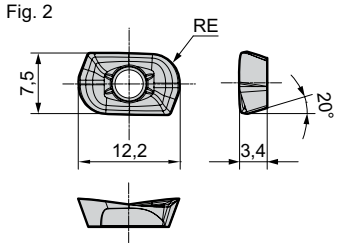


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

Use peripheral inserts with RE ≤ 0,8 mm from the second step and above.

WEZR 17000 M

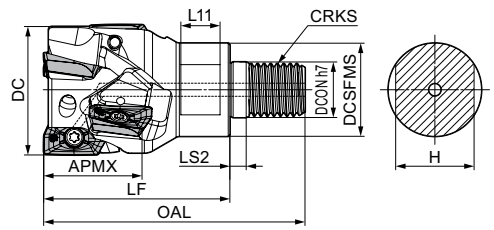
New

Repeater, Modular Type

Rake Angle	Radial	-9°
	Axial	10°

29 mm 90°

Fig. 1



Head

Dimensions (mm)

Cat. No.	Stock	DC	APMX	DCSFMS	DCON	CRKS	OAL	LF	LS2	L11	H	Total No. of Teeth	Steps	Effective No. of Teeth	Weight (kg)	Fig.
WEZR 17040M1629Z3	❍	40	29	28,5	17	M16	80	57	5	12	24	6	2	3	0,29	1

Inserts are sold separately. Arbor → H5.

Spare Parts

Applicable Cutters	Insert Screw		Wrench
		N·m	
WEZR 17_ _ _	BFTX0409IP	1,5	TRDR15IP

Identification Details

WEZR	17	040	M16	29	Z3
Cutter Series	Insert Size	Cutter Diameter	Mounting Screw Size	Max. Depth of Cut	Effective Number of Teeth

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Chipbreaker	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grades
P	Carbon Steel	≤ 280HB	G	100–**150**–200	0,10–**0,20**–0,30	ACU2500 XCU2500 ACP2000 ACP3000
		> 280HB	G	80–**100**–120	0,10–**0,20**–0,30	
	Alloy Steel	≤ 280HB	G	100–**150**–80	0,10–**0,20**–0,30	
M	Stainless Steel	≤ 280HB	G	80–**120**–160	0,10–**0,20**–0,30	ACU2500 ACM200 ACM300
K	Cast Iron Ductile Cast Iron	–	G	100–**150**–200	0,10–**0,20**–0,30	ACU2500 XCK2000 ACK2000 ACK3000
S	Exotic Alloy	–	G	40–**50**–60	0,10–**0,20**–0,30	ACU2500 ACM200 ACM300
N	Aluminum Alloy	Si ≤ 12,6%	S	300–**500**–800	0,05–**0,10**–0,15	DL2000 H20
		Si >12,6%	S	100–**200**–250	0,05–**0,10**–0,15	

Min. - **Optimum** - Max.

Note:
The cutting conditions above are a guide. Actual conditions will need to be adjusted according to machine rigidity, work clamp rigidity, depth of cut and other factors.
There may be cases where machining cannot be performed under recommended cutting conditions, depending on the machine rigidity and work rigidity.

*When mounting inserts with nose radius of ≥ 2,4 mm, modification of the body is required.

Modify this edge.

Reworking guidelines
Corner radius = 2,4 mm: C = 1 mm (AOMT170524PEER)
Corner radius = 3,0 mm: C = 1 mm (AOMT170530PEER)
Corner radius = 3,2 mm: C = 1 mm (AOMT170532PEER)
Corner radius = 4,0 mm: C = 2 mm (AOMT170540PEER)
Corner radius = 5,0 mm: C = 5 mm (AOMT170550PEER)
Corner radius = 6,4 mm: C = 5 mm (AOMT170564PEER)
Standard: R = 1 mm

C: Chamfer
R: Radius

● = Euro stock
○ = Japan stock
❑ = On request
▭ =Not available
N·m Recommended Tightening Torque (N·m)

Inserts

Precautions for Mounting → H29

Dimensions (mm)

Application	Coated Carbide									Carbide	DLC	Cermet		
High Speed / Light Cut		P K M	P		K	K		M S			N	P		
General Purpose	P K M S	P K M		P	K		K	M S	M S	N	N			
Roughing	P K M S			P			K		M S					
Cat. No.	ACU2500	XCU2500	ACP2000	ACP3000	XCK2000	ACK2000	ACK3000	ACM200	ACM300	H20	DL2000	T2500A	RE	Fig.
AOMT 170502PEER-L	●		–	❑		–	❑	●	●	–	–	❑	0,2	1
170504PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,4	1
170508PEER-L	●	❍	–	●	❍	–	●	●	●	–	–	●	0,8	1
170512PEER-L	●		–	❑		–	❑	●	●	–	–		1,2	1
170516PEER-L	●		–	❑		–	❑	●	●	–	–		1,6	1
AOMT 170502PEER-G	●		❑	●		❑	●	●	●	–	–	❑	0,2	1
170504PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,4	1
170505PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	0,5	1
170508PEER-G	●	❍	●	●	❍	●	●	●	●	–	–	●	0,8	1
170510PEER-G	●		❑	❑		❑	❑	●	●	–	–	❑	1,0	1
170512PEER-G	●		❑	●		❑	●	●	●	–	–	❑	1,2	1
170516PEER-G	●		❑	●		❑	●	●	●	–	–		1,6	1
170520PEER-G	●		❑	●		❑	●	●	●	–	–		2,0	1
170524PEER-G	●		❑	❑		❑	❑	●	●	–	–		2,4	1
170530PEER-G	●		❑	●		❑	●	●	●	–	–		3,0	1
170532PEER-G	●		❑	❑		❑	●	●	●	–	–		3,2	1
170540PEER-G	●		❑	●		❑	●	●	●	–	–		4,0	1
170550PEER-G	●		❑	●		❑	●	●	●	–	–		5,0	2
170564PEER-G	❑		❑	❑		❑	❑	●	●	–	–		6,4	2
AOMT 170504PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,4	1
170508PEER-H	●	❍	●	●	❍	●	●	●	●	–	–	–	0,8	1
170512PEER-H	●		❑	❑		❑	❑	●	●	–	–	–	1,2	1
170516PEER-H	●		❑	●		❑	❑	●	●	–	–	–	1,6	1
AOET 170502PEER-F	●		–			–		–		–	–	–	0,2	1
170504PEER-F	●		–			–		–		–	–	–	0,4	1
170505PEER-F	●		–			–		–		–	–	–	0,5	1
170508PEER-F	●		–			–		–		–	–	–	0,8	1
170510PEER-F	●		–			–		–		–	–	–	1,0	1
170512PEER-F	●		–			–		–		–	–	–	1,2	1
170516PEER-F	●		–			–		–		–	–	–	1,6	1
170520PEER-F	●		–			–		–		–	–	–	2,0	1
170524PEER-F	●		–			–		–		–	–	–	2,4	1
170530PEER-F	●		–			–		–		–	–	–	3,0	1
170532PEER-F	●		–			–		–		–	–	–	3,2	1
170540PEER-F	●		–			–		–		–	–	–	4,0	1
170550PEER-F	●		–			–		–		–	–	–	5,0	2
170564PEER-F	●		–			–		–		–	–	–	6,4	2
AOET 170502PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,2	1
170504PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,4	1
170505PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,5	1
170508PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	0,8	1
170510PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,0	1
170512PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,2	1
170516PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	1,6	1
170520PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,0	1
170524PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	2,4	1
170530PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,0	1
170532PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	3,2	1
170540PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	4,0	1
170550PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	5,0	2
170564PEFR-S	–	–	–	–	–	–	–	–	–	●	●	–	6,4	2

Fig. 1

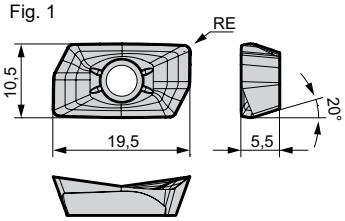
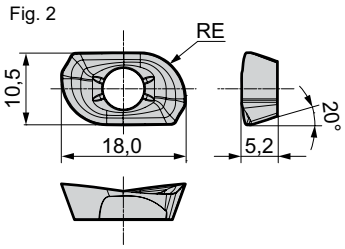


Fig. 2



L: Low cutting force
G: General purpose
H: Strong edge
F: Finishing
P: High-precision machining
S: Non ferrous metals

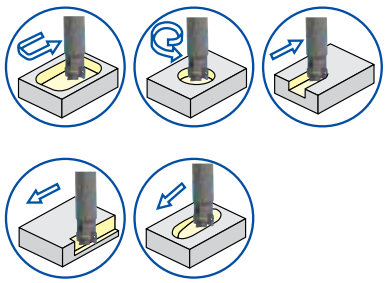
Use peripheral inserts with RE ≤ 0,8 mm from the second step and above.

"Wave Mill" Series
WEX Type

For the Smooth and Reliable Cutting Action

■ General Features

Wide Application Range



■ Ramping (Slant Milling)

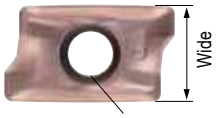
Tool Diam. Ø D	Max. Ramping Angle		
	Type 1000	Type 2000	Type 3000
10	2°30'		
12	1°45'		
14	1°25'	1°40‘	
16	1°00	1°20‘	
18	0°45'	1°10‘	
20	0°30'	1°00‘	
25	0°30'	0°45‘	1°30‘
32	0°25‘	0°35'	1°00‘
40	0°20‘	0°25‘	0°45‘
50	0°15‘	0°20'	0°30‘
63	0°10‘	0°15‘	0°20'
80			0°15'
100			–

Maximum ramping angle (α max. max.) depends on cutter diameter.

● Precision insert with strong cutting edge and low cutting force

Wave shaped 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.

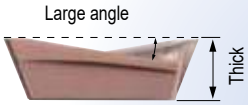
High precision curved cutting edge

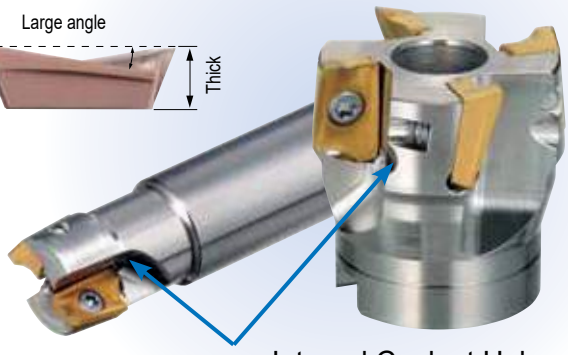


Screw hole size increased

High rake wave cutting edge

Large angle





● Internal Coolant Holes

Improved chip evacuation with air or coolant supply.

● Wide Variety of Inserts

6 types of chipbreaker design
(L, G, H, E, EH and S)
9 milling grades for a wide range of work materials and applications.
- ACP100, ACP200, ACP300 (steel milling grades)
- ACK200, ACK300 (cast iron milling grades)
- ACM200, ACM300 (stainless steel, exotic alloy milling grades)
- DL1000, H1 (aluminium milling grades)

● High Durable Body

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

■ Product Range

Type	Cat. No.	Series	Diameter Range (mm) (Ø 10 Ø 20 Ø 40 Ø 60)	Image
Shank	WEX 1000E	Short Type	10 – 25	WEX3000 WEX2000 WEX1000
	WEX 1000EL	Long Type	10 – 20	
	WEX 2000E	Short Type	14 – 63	
	WEX 2000EL	Long Type	14 – 40	
	WEX 2000EW	Weldon Shank Short Type	16 – 20	
	WEX 3000E	Short Type	25 – 63	
	WEX 3000EL	Long Type	25 – 40	
	WEX 3000EW	Weldon Shank Short Type	25 – 32	
Shell	WEX 1000F	Shell Type	32 – 63	→ G58
	WEX 2000F	Shell Type	40 – 63	
	WEX 3000F	Shell Type	40 – 63	
Modular	WEX 2000M	ModularType	16 – 40	
	WEX 3000M	Modular Type	25 – 40	

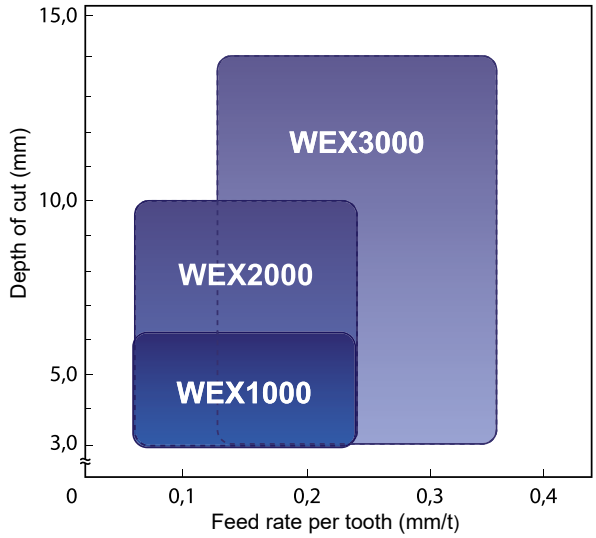
■ WEX1000 Type Expansion

- Efficient machining via high number of inserts
- Precise insert change tolerance provides high surface roughness qualitiy
- High shoulder accuracy due to optimized cutting edge
- Stable cutting conditions when utilising low rigidity machines
- Economic advantages using small AXMT06 inserts

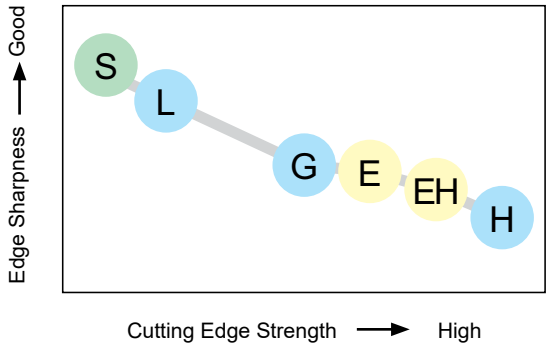
WEX3000 WEX2000 WEX1000

■ Application Range

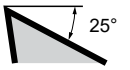
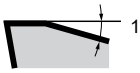
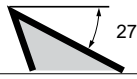
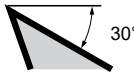
Shoulder Milling



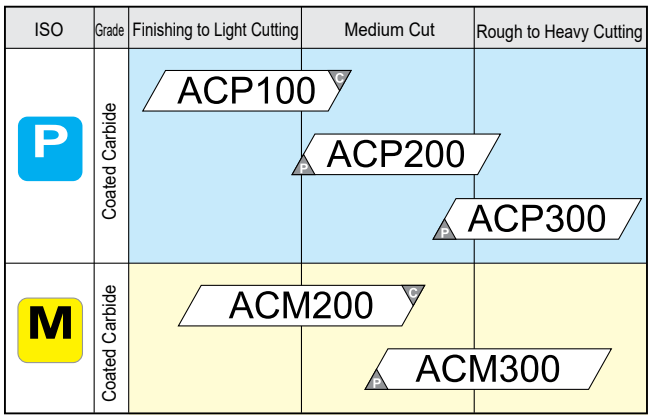
■ Chipbreaker Selection

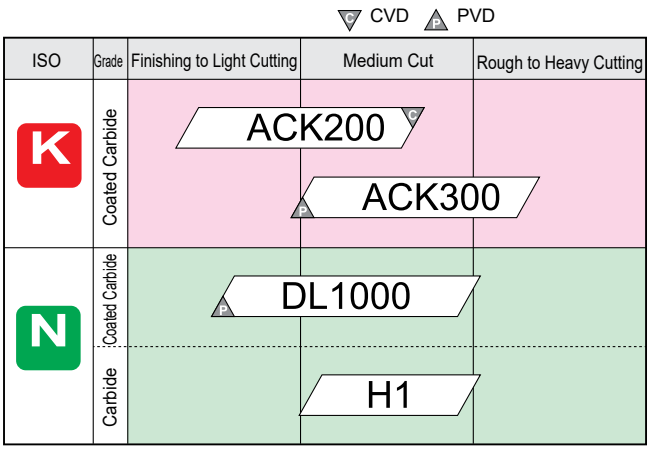


● Characteristics

Work Material	Steel, Cast Iron			Stainless Steel, Exotic Alloy		Aluminium
Chipbreaker	L	G	H	E	EH	S
Features	Low Cutting Force	General Purpose	Strong Edged	General Purpose	Strong Edged	High Rake
Chipbreaker Profile for 1000 Series Insert	 25°	25°	 15°			
Chipbreaker Profile for 2000 Series Insert		28°	20°	17°	17°	 27°
Chipbreaker Profile for 3000 Series Insert	25°	20°	5°	14°	8°	 30°
Application	Light cut, low rigidity milling and reduced burrs	**Main chipbreaker** general purpose to interrupted milling	Roughing, heavy interrupted and hardened steel milling	Light cutting to general purpose	Heavy interrupted machining	Aluminium, non-ferrous metal

■ Grade Selection





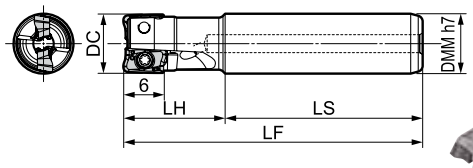
WEX 1000 E/L

WEX 1000 E/EL

Shank Type

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

5 mm 90°



● Body (Short Type „E“)

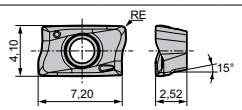
Cat. No.	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)
		DC	DMM	LH	LS	LF		
WEX 1010 E	▲	10	10	17	33	50	2	0,03
1012 E	▲	12	12	20	60	80	3	0,06
1014 E	▲	14	16	22	59	80	3	0,10
1016 E	▲	16	16	20	72	90	4	0,12
1018 E	▲	18	20	20	80	100	4	0,21
WEX 1020 E	▲	20	20	22	78	100	5	0,22
1025 E	▲	25	20	25	90	115	7	0,27

● Body (Long Type „EL“)

Cat. No.	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)
		DC	DMM	LH	LS	LF		
WEX 1010 EL	▲	10	8	17	83	100	2	0,03
1012 EL	▲	12	10	20	100	120	2	0,06
1014 EL	▲	14	12	20	125	145	3	0,11
1016 EL	▲	16	14	20	140	160	3	0,17
1016 EL15	▲	16	15	20	140	160	3	0,19
1018 EL	▲	18	16	20	160	180	3	0,25
WEX 1020 EL	▲	20	18	25	175	200	4	0,36
1020 EL19	▲	20	19	25	175	200	4	0,38

Inserts are not included.

Inserts for WEX1000 Type



Application	Coated Carbide							Carbide	DLC	
High Speed / Light cut	P			K		M/S		K/N	N	
General Purpose		P/M	P/M	K		M/S	M/S		N	
Roughing		P/M	P/M		K		M/S			
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 060204 PDER-L	▲	▲	▲	▲	▲	▲	▲	–	–	0,4
060208 PDER-L	▲	▲	▲	▲	▲	▲	▲	–	–	0,8
060212 PDER-L		▲			❍	▲	▲	–	–	1,2
AXMT 060204 PDER-G	▲	▲	▲	❍	▲	▲	▲	–	–	0,4
060208 PDER-G	▲	▲	▲	▲	▲	▲	▲	–	–	0,8
060212 PDER-G	❍	▲	▲		▲	▲	▲	–	–	1,2
AXMT 060204 PDER-H	❍	▲	▲		▲	▲	▲	–	–	0,4
060208 PDER-H		▲	▲		▲	▲	▲	–	–	0,8
060212 PDER-H	❍	▲	▲		▲	▲	▲	–	–	1,2
AXMT 060202 PDFR-S	–	–	–	–	–	–	–	❍	❍	0,2

L - Low cutting force
G - General type
H - Strong cutting edge
S - For aluminium alloy

Identification Details

WEX	1	016	EL	15
Cutter Series	1000 Series	Cutter Diameter	Shank Type	Shank Diameter

Spare Parts

Screw	Wrench	Applicable Endmill
0,5 N·m		
BFTX 01804 IP	TRX 06 IP	WEX 1000

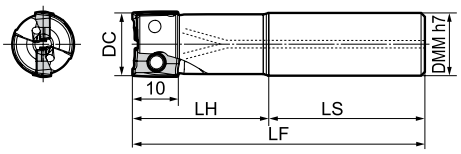
❍ = Japan stock
❑ = Delivery on request
▲ = To be replaced by new item
N·m Recommended Tightening Torque (N·m)

WEX 2000 E/EL

Shank Type

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

10 mm 90°



Body (Short Type „E“)

Cat. No.	Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)
WEX 2014 E	▲	14	16	25	55	80	1	0,10
2016 E	▲	16	16	25	75	100	2	0,13
2018 E	▲	18	16	25	75	100	2	0,14
WEX 2020 E	▲	20	20	30	80	110	3	0,22
2022 E	▲	22	20	30	80	110	3	0,23
WEX 2025 E	▲	25	25	35	85	120	4	0,38
2028 E	❍	28	25	35	85	120	4	0,39
2030 E	▲	30	25	35	85	120	4	0,40
WEX 2032 E	▲	32	32	40	90	130	5	0,70
2040 E	❍	40	32	30	120	150	6	0,91
WEX 2050 E	❍	50	32	30	120	150	7	1,02
2063 E	❍	63	32	30	120	150	8	1,22

Body (Long Type „EL“)

Cat. No.	Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)
WEX 2014 EL	▲	14	16	25	95	120	1	0,14
2016 EL	▲	16	16	25	120	145	2	0,19
2018 EL	❍	18	16	25	120	145	2	0,19
WEX 2020 EL	▲	20	20	40	110	150	2	0,32
2022 EL	❍	22	20	30	120	150	2	0,33
WEX 2025 EL	▲	25	25	50	120	170	2	0,55
2028 EL	❍	28	25	30	140	170	2	0,59
2030 EL	❍	30	25	30	140	170	2	0,60
WEX 2032 EL	❍	32	32	60	120	180	2	0,99
2040 EL	❍	40	32	30	150	180	2	1,12

Body (Long Type „E“ + Small Shank)

Cat. No.	Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)
WEX 2016 EL15	▲	16	15	25	120	145	2	0,17
2020 EL19	▲	20	19	40	110	150	2	0,30
2025 EL24	▲	25	24	50	120	170	2	0,53
2025 EL24Z3	▲	25	24	50	120	170	3	0,50
2032 EL30Z4	▲	32	30	60	120	180	2	0,95

Body (Weldon Shank Short Type „EW“)

Cat. No.	Stock	Dimensions (mm) DC	DMM	LH	LS	LF	No. of Teeth	Weight (kg)
WEX 2016 EW	▲	16	16	25	75	100	2	0,12
2020 EW	▲	20	20	30	80	110	3	0,21

Inserts are not included.

Identification Details

WEX	2	016	EL	15
Cutter Series	2000 Series	Cutter Diameter	Shank Type	Shank Diameter

Spare Parts

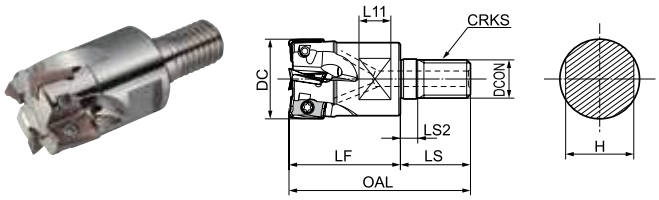
Screw	Wrench	Applicable Endmill
2,0 N·m		
BFTX 0305 IP	TRDR 08 IP	WEX 2014 – WEX 2018
BFTX 0306 IP		WEX 2020 – WEX 2063

WEX 2000 M

Modular Type

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

10mm 90°

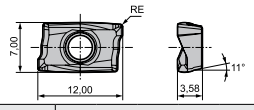


Head

Cat. No.	Stock	Dimensions (mm) DC	DCON	CRKS	OAL	LF	LS2	LS	L11	H	No. of Teeth
WEX 2016M08Z2	▲	16	8,5	M8	42	25	5	17	8	13	2
2018M08Z2	❍	18	8,5	M8	42	25	5	17	8	13	2
WEX 2020M10Z3	▲	20	10,5	M10	49	30	5	19	8	15	3
2022M10Z3	❍	22	10,5	M10	49	30	5	19	8	15	3
WEX 2025M12Z4	▲	25	12,5	M12	56	35	5	21	10	19	4
2028M12Z4	❍	28	12,5	M12	56	35	5	21	10	19	4
WEX 2030M16Z4	❍	30	17,0	M16	63	40	5	23	10	24	4
2032M16Z5	▲	32	17,0	M16	63	40	5	23	10	24	5
2040M16Z6	❍	40	17,0	M16	63	40	5	23	10	24	6

Inserts are not included.

Inserts for WEX2000 Type



Application	Coated Carbide							Carbide	DLC	
High Speed / Light cut	P			K		M S		K N	N	
General Purpose		P M	P M	K		M S	M S		N	
Roughing		P M	P M		K		M S			
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 123504 PEER-G	▲	▲	▲	▲	▲			–	–	0,4
123508 PEER-G	▲	▲	▲	▲	▲			–	–	0,8
123512 PEER-G	▲	▲	▲	▲	▲			–	–	1,2
AXMT 123504 PEER-H	▲	▲	▲	▲	▲			–	–	0,4
123508 PEER-H	▲	▲	▲	▲	▲			–	–	0,8
123512 PEER-H	▲	▲	▲	▲	▲			–	–	1,2
AXMT 123504 PEER-E						▲	▲	–	–	0,4
123508 PEER-E						▲	▲	–	–	0,8
123512 PEER-E						▲	▲	–	–	1,2
AXMT 123508 PEER-EH						▲	▲	–	–	0,8
AXET 123502 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,2
123504 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,4
123508 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,8

G - General type
H - Strong cutting edge
E - For stainless steel / exotic alloy
EH - Strong edge for stainless steel / exotic alloy
S - For aluminium alloy

– Unable to produce

Identification Details

WEX	2	016	M08	Z2
Cutter Series	2000 Series	Cutter Diameter	Mounting Screw Size	No. of Teeth

Spare Parts

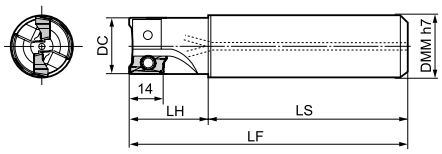
Screw	Wrench	N·m	Applicable Endmill
BFTX 0305 IP	TRDR 08 IP	2,0	WEX 2016M, WEX 2018M
BFTX 0306 IP		2,0	WEX 2020M – WEX 2040M
BFTX 0407 IP	TRDR 15 IP	3,0	WEX 3025M – WEX 3030M
BFTX 0409 IP		3,0	WEX 3032M – WEX 3040M

WEX 3000 E/EL

Shank Type

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

14 mm 90°



▲

Body (Short Type „E“)

Cat. No.	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)
		DC	DMM	LH	LS	LF		
WEX 3025 E	▲	25	25	35	85	120	2	0,37
3028 E	❍	28	25	35	85	120	2	0,39
3030 E	❍	30	25	40	90	130	3	0,42
WEX 3032 E	▲	32	32	40	90	130	3	0,67
3035 E	▲	35	32	40	90	130	3	0,69
3040 E	▲	40	32	50	120	170	4	1,01
3050 E	❍	50	32	50	120	170	5	1,23
3063 E	❍	63	32	50	120	170	6	1,58

Body (Short Type „E“ + Small Shank)

Cat. No.	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)
		DC	DMM	LH	LS	LF		
WEX 3025 E20	❍	25	20	35	85	120	2	0,25
3032 E25	❍	32	25	40	90	130	3	0,43

Body (Long Type „EL“)

Cat. No.	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)
		DC	DMM	LH	LS	LF		
WEX 3025 EL	▲	25	25	50	120	170	2	0,54
3028 EL	❍	28	25	50	120	170	2	0,56
3030 EL	❍	30	25	60	120	180	2	0,60
WEX 3032 EL	▲	32	32	60	120	180	2	0,95
3035 EL	▲	35	32	60	120	180	2	0,98
3040 EL	▲	40	32	80	140	220	2	1,38

Body (Weldon Shank Short Type „EW“)

Cat. No.	Stock	Dimensions (mm)					No. of Teeth	Weight (kg)
		DC	DMM	LH	LS	LF		
WEX 3025 EW	▲	25	25	35	85	120	2	0,36
3032 EW	▲	32	32	40	90	130	3	0,65

Inserts are not included.

* **ATTENTION**: If nose radius of inserts is 2,0 mm or more please modify cutter body as indicated.

Standard Chamfer is 0,5 mm by 45 degrees

Increase Chamfer to 1 mm x 45 degrees when using 2,0 mm radius inserts AXMT 170520PEER

Increase chamfer to 1,5 mm x 45 degrees when using 3,0 mm radius inserts AXMT 170530 PEER

Spare Parts

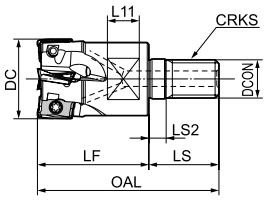
Screw	Wrench	Applicable Endmill
3,0 N·m		
BFTX 0407 IP	TRDR 15 IP	WEX 3025 – WEX 3030
BFTX 0409 IP		WEX 3032 – WEX 3063

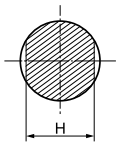
WEX 3000 M

Modular Type

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

14 mm 90°



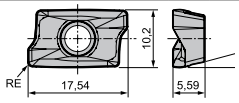


Head

Cat. No.	Stock	Dimensions (mm)									No. of Teeth
		DC	DCON	CRKS	OAL	LF	LS2	LS	L11	H	
WEX 3025M12Z2	▲	25	12,5	M12	56	35	5	21	10	19	2
3028M12Z2	❍	28	12,5	M12	56	35	5	21	10	19	2
WEX 3030M16Z3	❍	30	17,0	M16	63	40	5	23	10	24	3
3032M16Z3	▲	32	17,0	M16	63	40	5	23	10	24	3
3035M16Z3	❍	35	17,0	M16	63	40	5	23	10	24	3
3040M16Z4	❍	40	17,0	M16	63	40	5	23	10	24	4

Inserts are not included.

Inserts for WEX3000 Type



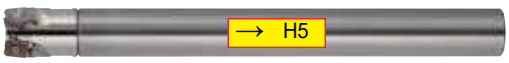
Application	Coated Carbide							Carbide	DLC	
High Speed / Light cut	P			K		M S		K N	N	
General Purpose		P M	P M	K		M S	M S		N	
Roughing		P M	P M		K		M S			
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 170508 PEER-L	▲	▲	▲	▲	▲			–	–	0,8
AXMT 170504 PEER-G	▲	▲	▲	▲	▲			–	–	0,4
170508 PEER-G	▲	▲	▲	▲	▲			–	–	0,8
170512 PEER-G	▲	▲	▲	▲	▲			–	–	1,2
170516 PEER-G	❍	▲	▲	▲	▲			–	–	1,6
170520 PEER-G*	▲	▲	▲	▲	▲			–	–	2,0
170530 PEER-G*	▲	▲	▲	▲	▲			–	–	3,0
AXMT 170508 PEER-H	▲	▲	▲	▲	▲			–	–	0,8
170512 PEER-H	▲	▲	▲	▲	▲			–	–	1,2
AXMT 170504 PEER-E						▲	▲	–	–	0,4
170508 PEER-E						▲	▲	–	–	0,8
170512 PEER-E						▲	▲	–	–	1,2
170516 PEER-E						▲	▲	–	–	1,6
170520 PEER-E*						▲	▲	–	–	2,0
170530 PEER-E*						▲	▲	–	–	3,0
AXMT 170508 PEER-EH			▲			▲	▲	–	–	0,8
AXET 170502 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,2
170504 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,4
170508 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,8

L - Low cutting force
G - General type
H - Strong cutting edge
E - For stainless steel / exotic alloy
EH - Strong edge for stainless steel / exotic alloy
S - For aluminium alloy

– Unable to produce
* Cutter body modification is required

Identification Details

WEX	3	025	M12	Z2
Cutter Series	3000 Series	Cutter Diameter	Mounting Screw Size	No. of Teeth

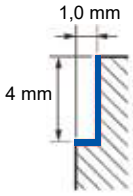


❍ = Japan stock

❑ = Delivery on request
▲ = To be replaced by new item

N·m Recommended Tightening Torque (N·m)

■ Recommended Cutting Conditions



● WEX1000 Series

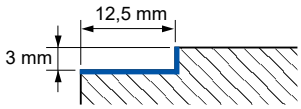
Cutter: WEX1012E Insert: AXMT060208PDER - □

Cutting Data: a_p = 4 mm, a_e = 1 mm, dry

ISO	Material	HB	Chipbreaker	Coated Carbide ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			„Diamond like Carbon" Coated Carbide DL1000		
				Feed Rate (mm/tooth)																							
				0,08	0,12	0,16	0,08	0,12	0,16	0,08	0,12	0,16	0,10	0,15	0,20	0,10	0,15	0,20	0,08	0,10	0,12	0,08	0,10	0,12			
				Cutting Speed v_c (m/min)																							
P	Unalloyed steel, <0, 15%C, annealed	125	G	280	240	220	240	220	200	220	200	180															
	" , <0, 45%C, annealed	190	G	200	180	160	180	160	140	180	160	140															
	" , <0, 45%C, tempered	250	G	180	120	140	160	140	120	150	130	110															
	" , <0, 75%C, annealed	270	G	160	140	120	150	130	110	130	110	110															
	" , <0, 75%C, tempered	300	G	100	80	70	90	70	60	70	60	50															
	Low alloyed steel, annealed	180	G	200	180	160	180	160	150	160	150	130															
	" , tempered	275	G	130	110	90	120	100	90	100	90	80															
	" , tempered	300	G	120	100	80	100	90	80	90	80	60															
	" , tempered	350	G	90	80	60	80	70	60	70	60	40															
	High alloyed and tool steel, annealed	200	G	180	170	160	170	160	130	150	140	120															
	" , tempered	325	G	100	80	60	80	60	50	60	50	30															
M	Stainless steel, ferritic/martensitic, annealed	200	E																175	150	120	140	130	110			
	Martensitic, tempered	240	E																140	120	100	120	100	90			
	Austenitic, plunged	180	E																180	160	140	160	140	130			
K	Grey cast iron		G										240	220	200	220	200	180									
	Nodular cast iron		G										160	140	120	140	120	100									
S	High tempered resist. alloys, Fe based, annealed		E																50	35		45	25				
N	Aluminium alloy, Si < 13%																								800	600	400
	Aluminium alloy, Si > 13%																								240	200	160
	Copper alloy																								330	300	270

The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine, work shape and clamping. They will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.
For groove milling, reduce the feed rate approximately 70 % of the corresponding value shown above.

● WEX2000 Series



Cutter: WEX2025E Insert: AXMT123508PEER - □

Cutting Data: a_p = 3 mm, a_e = 12,5 mm, dry

ISO	Material	HB	Chipbreaker	Coated Carbide ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			„Diamond like Carbon" Coated Carbide DL1000		
				Feed Rate (mm/tooth)																							
				0,08	0,15	0,20	0,08	0,15	0,20	0,08	0,15	0,20	0,08	0,15	0,20	0,08	0,15	0,20	0,08	0,15	0,20	0,08	0,15	0,20	0,05	0,15	0,22
				Cutting Speed v_c (m/min)																							
P	Unalloyed steel, <0, 15%C, annealed	125	G	380	350	330	350	330	315	330	315	295															
	" , <0, 45%C, annealed	190	G	285	255	235	255	235	220	235	220	220															
	" , <0, 45%C, tempered	250	G	235	210	190	210	190	170	190	170	150															
	" , <0, 75%C, annealed	270	G	190	162	143	171	152	133	152	133	115															
	" , <0, 75%C, tempered	300	G	145	115	95	115	95	75	95	75	55															
	Low alloyed steel, annealed	180	G	265	235	220	235	220	200	220	200	180															
	" , tempered	275	G	170	145	125	150	130	115	130	115	95															
	" , tempered	300	G	150	125	105	135	115	95	115	95	75															
	" , tempered	350	G	125	95	75	105	85	65	85	65	45															
	High alloyed and tool steel, annealed	200	G	235	210	190	210	190	170	190	170	150															
	" , tempered	325	G	125	95	75	95	75	55	75	55	35															
M	Stainless steel, ferritic/martensitic, annealed	200	E																175	155	125	155	140	110			
	Martensitic, tempered	240	EH																160	140	110	145	125	100			
	Austenitic, plunged	180	E																190	170	140	170	150	125			
K	Grey cast iron		G										285	255	235	255	235	220									
	Nodular cast iron		G										190	160	140	160	140	125									
S	High tempered resist. alloys, Fe based, annealed	300	E																50	40		45	35				
	" , hardened	330	E																35	25		30	20				
N	Aluminium alloy, Si < 13%		S																						1000	750	500
	Aluminium alloy, Si > 13%		S																						250	200	170
	Copper alloy		S																						350	330	300

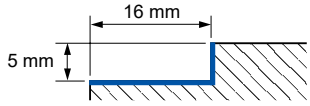
The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine, work shape and clamping. They will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.
For groove milling, reduce the feed rate approximately 70 % of the corresponding value shown above.

Recommended Cutting Conditions

WEX3000 Series

Cutter: WEX30325E Insert: AXMT170508PEER - □

Cutting Data: a_p = 5 mm, a_e = 16 mm, dry



ISO	Material	HB	Chipbreaker	Coated Carbide																							„Diamond like Carbon" Coated Carbide
				ACP100			ACP200			ACP300			ACK200			ACK300			ACM200			ACM300			DL1000		
				Feed Rate (mm/tooth)																							
				0,12	0,25	0,35	0,12	0,25	0,35	0,12	0,25	0,35	0,12	0,25	0,35	0,12	0,25	0,35	0,12	0,25	0,35	0,12	0,25	0,35	0,05	0,15	0,25
				Cutting Speed v_c (m/min)																							
P	Unalloyed steel, <0, 15%C, annealed	125	G	400	370	350	370	350	330	350	330	310															
	" , <0, 45%C, annealed	190	G	300	270	250	270	250	230	250	230	210															
	" , <0, 45%C, tempered	250	G	250	220	200	220	200	180	200	180	160															
	" , <0, 75%C, annealed	270	G	200	170	150	180	160	140	160	140	120															
	" , <0, 75%C, tempered	300	G	150	120	100	120	100	80	100	80	60															
	Low alloyed steel, annealed	180	G	280	250	230	250	230	210	230	210	190															
	" , tempered	275	G	180	150	130	160	140	120	140	120	100															
	" , tempered	300	G	160	130	110	140	120	100	120	100	80															
	" , tempered	350	G	130	100	80	110	90	70	90	70	50															
	High alloyed and tool steel, annealed	200	G	250	220	200	220	200	180	200	180	160															
	" , tempered	325	G	130	100	80	100	80	60	80	60	40															
M	Stainless steel, ferritic/martensitic, annealed	200	E																185	165	135	165	150	120			
	Martensitic, tempered	240	EH																170	150	120	150	135	110			
	Austenitic, plunged	180	E																200	180	150	180	160	135			
K	Grey cast iron		G										300	270	250	270	250	230									
	Nodular cast iron		G										200	170	150	170	150	130									
S	High tempered resist. alloys, Fe based, annealed	300	E																50	30		45	25				
	" , hardened	330	E																50	30		45	25				
N	Aluminium alloy, Si < 13%		S																						1000	750	500
	Aluminium alloy, Si > 13%		S																						250	200	170
	Copper alloy		S																						350	330	300

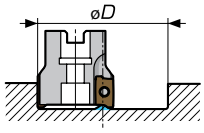
The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine, work shape and clamping. They will need to be adjusted according to machine rigidity, work clamp rigidity, cutting depth and other factors.

For groove milling, reduce the feed rate approximately 70 % of the corresponding value shown above.

Recommended Values for Helical Milling and Ramping

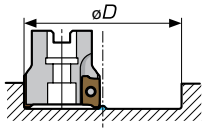
Helical Boring

≤ Min. Diameter



Center uncut portion cannot be removed by traverse cutting with the same cutter.

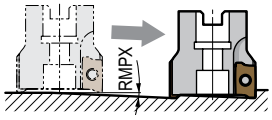
≥ Max. Diameter



Center uncut portion can be removed by traverse cutting with the same cutter.

Plunging

Use at ≤ RMPX

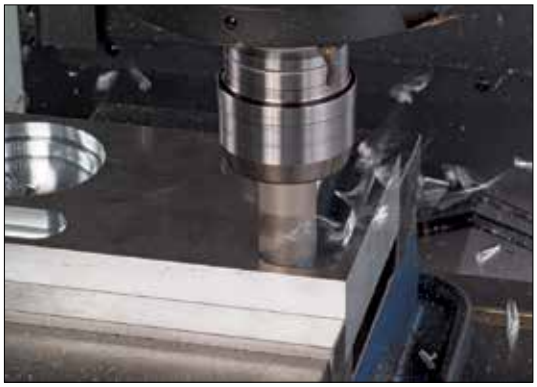


Recommended Values for Helical and Plunging

Cutter External Diameter DC	WEX1000 (AXMT06...)			WEX2000 (AX□T12...)			WEX3000 (AX□T17...)		
	Helical		Plunging	Helical		Plunging	Helical		Plunging
	Work Diameter		Max. Ramping Angle	Work Diameter		Max. Ramping Angle	Work Diameter		Max. Ramping Angle
	Min.	Max.		Min.	Max.		Min.	Max.	
10	16,0	18,0	2°30'						
12	20,0	22,0	1°45'						
14	24,0	26,0	1°25'	25,0	27,0	1°40'			
16	28,0	30,0	1°00'	29,0	31,0	1°20'			
18	32,0	34,0	0°45'	33,0	35,0	1°10'			
20	36,0	38,0	0°30'	37,0	39,0	1°00'			
22				41,0	43,0	0°50'			
25	46,0	48,0	0°30'	47,0	49,0	0°45'	44,5	48,0	1°30'
28				53,0	55,0	0°45'	50,5	54,0	1°10'
30				57,0	59,0	0°40'	54,5	58,0	1°10'
32	60,0	62,0	0°25'	61,0	63,0	0°35'	58,5	62,0	1°00'
35							64,5	68,0	0°50'
40	76,0	78,0	0°20'	77,0	79,0	0°25'	74,5	78,0	0°45'
50	96,0	98,0	0°15'	97,0	99,0	0°20'	94,5	98,0	0°30'
63	122,0	124,0	0°10'	123,0	125,0	0°15'	120,5	124,0	0°20'
80							154,5	158,0	0°15'
100									
125									

The above recommended values are for a nose radius of 0,8 mm.

"Wave Mill" Series WAX Type

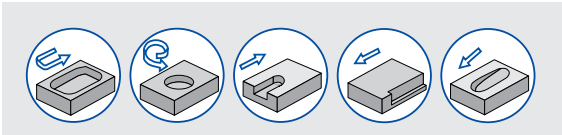


Overview

Based on our proven Wavemill design this new range of WAX cutters is capable of rough and finishing Aluminium Alloys and other Non Ferrous Metals. It is ideal for high productivity Aluminium machining to exacting tolerances in the Aircraft, Electronics, and Automotive industries. The award winning Auroracoat DLC (diamond like carbon) inserts resist chip adhesion and substantially increase both tool life and productivity when dry machining Aluminium helping customers boost compliance with ISO14001 accreditation standards

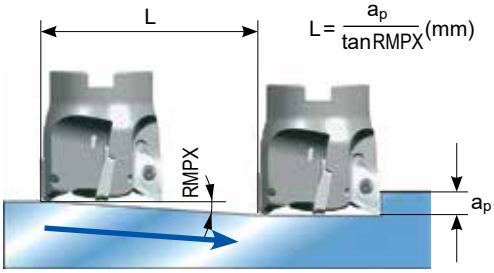
Advantages

- High Productivity
- Dry machining capability with MQL system
- DLC (diamond like carbon) inserts
- True 90 degree shoulder milling
- Chip adhesion resistance
- Wide range of nose radius



Ramping (Slant Milling)

Maximum ramping angle (α max. max.) depends on cutter diameter.
Minimum milling length (L min) is the ramping distance required to reach the maximum cutting depth (a_p max) at the maximum ramping angle of that cutter.
Minimum milling length (L) for any depth can be calculated by the equation below:



$$L = \frac{a_p}{\tan RMPX} (mm)$$

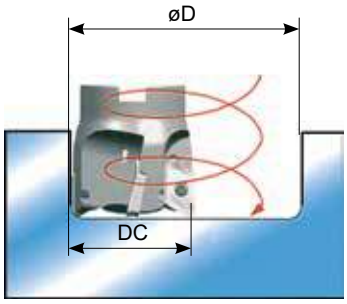
WAX3000 E/EL Type (mm)

Cutter Diameter DC	Ramping Angle RMPX max.	Depth- of Cut a_p max.	Milling Distance L min
20	8°	10	72
25	17°	10	33
32	12°	10	47
40	9°	10	64

WAX3000 RS Type (mm)

Cutter Diameter DC	Ramping Angle RMPX max.	Depth- of Cut a_p max.	Milling Distance L min
50	7°	10	82
60	5°	10	115
80	3°	10	191
100	3°	10	191
125	2°	10	287

Helical Milling



Helical Milling Diameter (mm)

Cutter Diameter DC	Milling Diameter øD	
	Min.	Max.
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 DC	Spindle Revolution n (min^{-1})	Cutting Speed v_c (m/min)
20	14.000	880
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 Cutting Conditions

Work Material	Aluminum Alloy
Cutting Speed	600–1.200 m/min
Feed Rate	0,05–0,25 mm/tooth

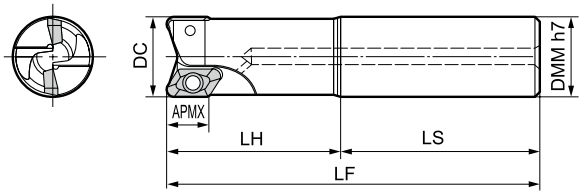
WAX 3000 E/EL

16–18mm 90°

Axial rake angle	6°
Radial rake angle	19–25°

(Endmill)

Short Type "E"
Long Type "EL"



Body

(For inserts with nose radius ≤ 3,2 mm)

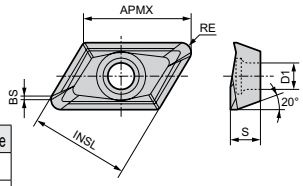
Cat. No.	Stock	Dimensions (mm)					No.of teeth	Weight (Kg)
		DC	DMM	LF	LH	LS		
WAX 3020 E -3.2	●	20	20	130	60	70	1	0,25
WAX 3025 E -3.2	●	25	25	140	60	80	2	0,42
3025 EL-3.2	●	25	25	200	60	140	2	0,63
WAX 3032 E -3.2	●	32	32	150	70	80	2	0,75
3032 EL-3.2	●	32	32	220	70	150	2	1,2
WAX 3040 E -3.2	●	40	32	160	70	90	3	1,0
3040 EL-3.2	●	40	32	220	70	150	3	1,4

Body

(For inserts with nose radius ≥ 4,0 mm)

Cat. No.	Stock	Dimensions (mm)					No.of teeth	Weight (Kg)
		DC	DMM	LF	LH	LS		
WAX 3020 E -4.0		20	20	130	60	70	1	0,25
WAX 3025 E -4.0	●	25	25	140	60	80	2	0,42
3025 EL-4.0	●	25	25	200	60	140	2	0,63
WAX 3032 E -4.0	●	32	32	150	70	80	2	0,75
3032 EL-4.0		32	32	220	70	150	2	1,2
WAX 3040 E -4.0	❍	40	32	160	70	90	3	1,0
3040 EL-4.0	●	40	32	220	70	150	3	1,4

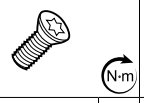
Inserts for WAX 3000 Type



Application	DLC Coated	Carbide
High Speed / Light cut	K N	N
General Purpose		N
Roughing		

Cat. No.	DL1000	H1	Dimensions (mm)					
			APMX	INSL	BS	RE	S	D1
AECT 160404 PEFRA	●	●	18	16,4	1,4	0,4	5	4,4
160408 PEFRA	●	●	18	16,4	1,0	0,8	5	4,4
160412 PEFRA	●	●	18	16,4	0,6	1,2	5	4,4
160416 PEFRA	●	●	17,5	16,4	0,5	1,6	5	4,4
160420 PEFRA	●	●	17,5	16,4	0,5	2,0	5	4,4
160430 PEFRA	●	●	17	16,4	0,7	3,0	5	4,4
160432 PEFRA	●	●	17	16,4	0,5	3,2	5	4,4
AECT 160440 PEFRA	●	●	16,5	16,4	0,5	4,0	5	4,4
160450 PEFRA	●	●	16	16,4	0,4	5,0	5	4,4

Spare Parts

Insert Screw		Insert Wrench	Applicable Endmill
			
BFTX 0408	3,0	TRD 15	WAX 3000 E/EL

● = Euro stock
❍ = Japan stock
❑ = Delivery on request

→ G72-G73

N·m Recommended Tightening Torque (N·m)

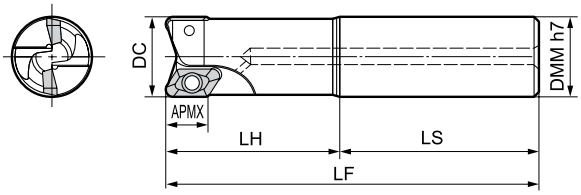
WAX 4000 E/EL

22–24mm 90°

Axial rake angle	6°
Radial rake angle	19–25°

(Endmill)

Short Type "E"
Long Type "EL"



Body

(For inserts with nose radius ≤ 3,2 mm)

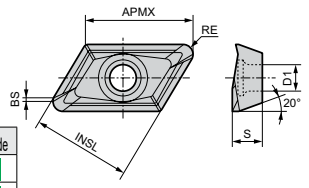
Cat. No.	Stock	Dimensions (mm)					No.of teeth	Weight (Kg)
		DC	DMM	LF	LH	LS		
WAX 4025E -3.2	❑	25	25	140	60	80	1	0,41
4025EL-3.2	❑	25	25	200	60	140	1	0,63
WAX 4032E -3.2	❑	32	32	150	70	80	1	0,72
4032EL-3.2	❑	32	32	220	70	150	1	1,2
WAX 4040E -3.2	❑	40	32	160	70	90	2	0,88
4040EL-3.2	❑	40	32	220	70	150	2	1,2

Body

(For inserts with nose radius ≥ 4,0 mm)

Cat. No.	Stock	Dimensions (mm)					No.of teeth	Weight (Kg)
		DC	DMM	LF	LH	LS		
WAX 4025E -4.0	❑	25	25	140	60	80	1	0,41
4025EL-4.0	❑	25	25	200	60	140	1	0,63
WAX 4032E -4.0	❑	32	32	150	70	80	1	0,72
4032EL-4.0	❑	32	32	220	70	150	1	1,2
WAX 4040E -4.0	❑	40	32	160	70	90	2	0,88
4040EL-4.0	❑	40	32	220	70	150	2	1,2

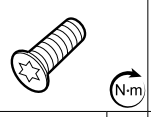
Inserts for WAX 4000 Type



Application	DLC Coated	Carbide
High Speed / Light cut	K N	N
General Purpose		N
Roughing		

Cat. No.	DL1000	H1	Dimensions (mm)					
			APMX	INSL	BS	RE	S	D1
AECT 220604 PEFRA	❑	❑	24	21,8	1,5	0,4	6,35	6,0
220608 PEFRA	❑	❑	24	21,8	1,2	0,8	6,35	6,0
220612 PEFRA	❑	❑	24	21,8	0,8	1,2	6,35	6,0
220616 PEFRA	❑	❑	24	21,8	0,4	1,6	6,35	6,0
220620 PEFRA	❑	❑	24	21,8	0,5	2,0	6,35	6,0
220630 PEFRA	❑	❑	23	21,8	0,6	3,0	6,35	6,0
220632 PEFRA	❑	❑	23	21,8	0,4	3,2	6,35	6,0
AECT 220640 PEFRA	❑	❑	22	21,8	1,2	4,0	6,35	6,0
220650 PEFRA	❑	❑	22	21,8	0,4	5,0	6,35	6,0

Spare Parts

Insert Screw		Insert Wrench	Applicable Endmill
			
BFTX 0509 N	5,0	TRD 20	Ø 25 – Ø 32
BFTX 0511 N		TRD 20	Ø 40 – Ø 125

→ G72-G73

WRX Type

General Features

The WRX Wave repeater end mill system features AXMT style inserts vertically mounted and positioned to provide a long continuous cutting edge suitable for deep shoulder milling. Designed to run at elevated feed rates the soft cutting action reduces cutting resistance, vibration and noise to substantially improve tool life and surface finish.

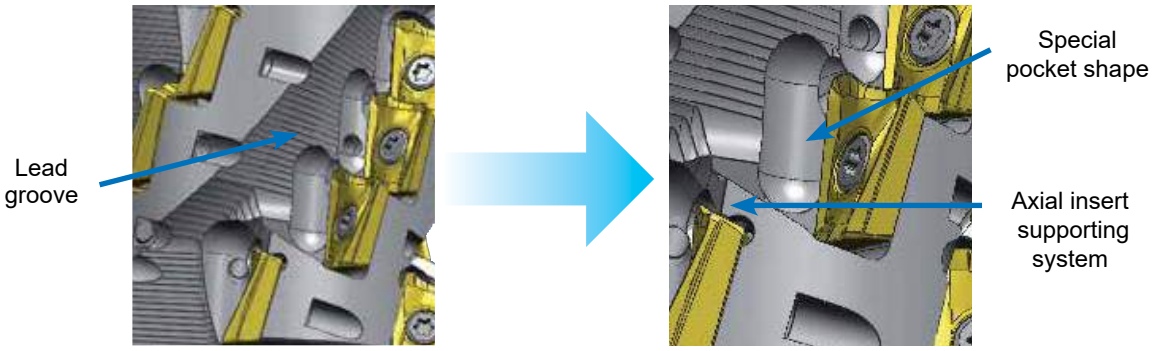
Available with our new generation Super FF and Super ZX coated inserts for unbeatable performance.

Product Range

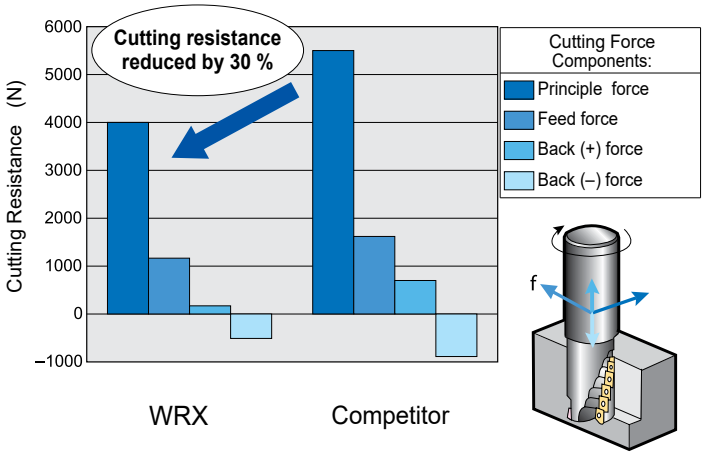
- WRX 2000 series with 12 mm inserts
- WRX 3000 series with 17 mm inserts
- Cutter Diameters - 20 mm (a_p = 18 mm) to 100 mm (a_p = 53 mm)
- Special Order Options – WRX Cutter with integrated arbor
  Shell type with detachable head
- Wide ISO Application Range – P/M/K/N classification

Advantages

- Optimised insert positions reduce cutting resistance and vibration
- Integral coolant improves chip flow
- Primary chip slot for smooth and fast chip evacuation
- Optimised insert pocket maximises rigidity
- Bottom edge support improves tool life and cutting performance

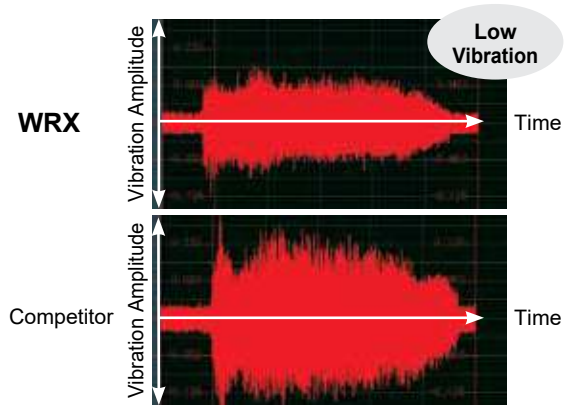


Cutting Resistance Comparison



Work Material:	C50
Tool:	WRX2025RH27E25
Cutting Conditions:	v_c = 100 m/min, f_z = 0,15 mm/tooth
	a_p = 25 mm, a_e = 10 mm, dry

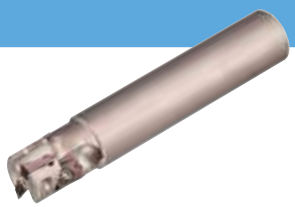
Vibration Comparison

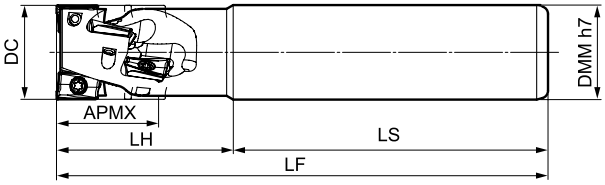


Work Material:	C50
Tool:	WRX3080RH53F32
Cutting Conditions:	v_c = 150 m/min, f_z = 0,15 mm/tooth
	a_p = 25 mm, a_e = 10 mm, dry

● = Euro stock
❑ = Delivery on request
▲ = To be replaced by new item
Recommended Tightening Torque (N·m)

WRX 2000 Series with AXMT 12 mm inserts





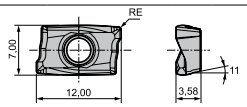
Body (Cylindrical Shank Type)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	No. of rows	Effective teeth
		DC	APMX	DMM	LF	LH	LS			
WRX2020RH18E20	●	20	18	20	120	40	80	4	2	2
WRX2020RH36E20	❑	20	36	20	130	45	85	4	4	1
WRX2025RH18E25	●	25	18	25	130	45	85	6	2	3
WRX2025RH27E25	●	25	27	25	130	45	85	6	3	2
WRX2032RH18E32	❑	32	18	32	140	50	90	8	2	4
WRX2032RH27E32	●	32	27	32	130	45	85	9	3	3
WRX2040RH18E40	❑	40	18	40	160	40	120	10	2	5
WRX2040RH36E40	❑	40	36	40	130	45	85	16	4	4

Body (Weldon Shank Type)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	No. of rows	Effective teeth
		DC	APMX	DMM	LF	LH	LS			
WRX2020RH18W20	●	20	18	20	120	40	80	4	2	2
WRX2020RH36W20	❑	20	36	20	130	45	85	4	4	1
WRX2025RH18W25	●	25	18	25	130	45	85	6	2	3
WRX2025RH27W25	●	25	27	25	130	45	85	6	3	2
WRX2032RH18W32	❑	32	18	32	140	50	90	8	2	4
WRX2032RH27W32	●	32	27	32	130	45	85	9	3	3
WRX2040RH18W40	❑	40	18	40	160	40	120	10	2	5
WRX2040RH36W40	❑	40	36	40	130	45	85	16	4	4

Inserts (Same as for Wavemill WEX 2000 Type)



Application	Coated Carbide							Carbide	DLC	
High Speed / Light cut	P			K		M S		K N	N	
General Purpose		P M	P M	K		M S	M S		N	
Roughing		P M	P M		K		M S			
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 123504 PEER-G	▲	▲	▲	▲	▲			–	–	0,4
123508 PEER-G	▲	▲	▲	▲	▲			–	–	0,8
123512 PEER-G	▲	▲	▲	▲	▲			–	–	1,2
AXMT 123504 PEER-H	▲	▲	▲	▲	▲			–	–	0,4
123508 PEER-H	▲	▲	▲	▲	▲			–	–	0,8
123512 PEER-H	▲	▲	▲	▲	▲			–	–	1,2
AXMT 123504 PEER-E						▲	▲	–	–	0,4
123508 PEER-E						▲	▲	–	–	0,8
123512 PEER-E						▲	▲	–	–	1,2
AXMT 123508 PEER-EH						▲	▲	–	–	0,8
AXET 123502 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,2
123504 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,4
123508 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,8

– Unable to produce

G - General type
H - Strong cutting edge
E - For stainless steel / exotic alloy
EH - Strong edge for stainless steel / exotic alloy
S - For aluminium alloy

Spare Parts (WRX 2000)

Screw	Wrench
2,0 Nm	
BFTX 0306 IP	TRDR 08 IP

Identification Details

WRX 20 25 R H 27 W 25

- 20: Insert Size
- 25: Tool øD
- R: Cutting Direction
- H: Inner coolant
- 27: Cutting Edge Lengh
- W: Arbor Type
  - **E** - Straight Shank
  - **W** - Weldon Shank
  - **F** - Shell Type
- 25: Arbor Diameter

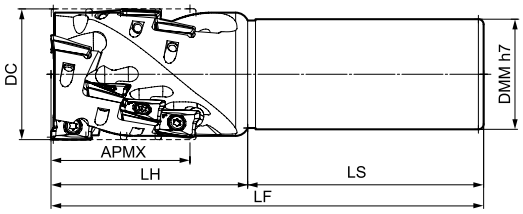
Application Examples

Example

Work Material	Construction Machine Parts (USt.42-2)		
Tool	Body	Sumitomo	Competitor
		WRX2000 Weldon shank	Ø 38,1
	Insert	AXMT	18 mm
	Insert grade	ACP200	PVD Type
	Tool dia. (mm)	38,1	38,1
	Total teeth	24	16
	Effective teeth	4	4
Cutting Data	Cutting speed (m/min)	180	137
	Feed (mm/t)	0,09	0,1
	Axial depth of cut (mm)	38,1	38,1
	Radial width of cut (mm)	3,2	3,2
	Coolant	Wet	Wet
Result	Tool life / Cutting edge	60	40
Benefits	1,5 times longer tool life 30 % increased productivity		

→ G59

WRX 3000 Series with AXMT 17 mm inserts



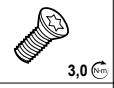
Body (Cylindrical Shank Type)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	No. of rows	Effective teeth
		DC	APMX	DMM	LF	LH	LS			
WRX3032RH40E32	●	32	40	32	150	65	85	6	3	2
WRX3040RH27E40	❑	40	27	40	180	60	120	6	2	3
WRX3040RH40E40	●	40	40	40	150	65	85	9	3	3
WRX3050RH27E40	❑	50	27	40	180	60	120	8	2	4
WRX3050RH53E40	●	50	53	40	165	75	90	12	4	3

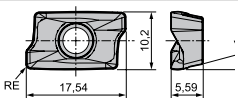
Body (Weldon Shank Type)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	No. of rows	Effective teeth
		DC	APMX	DMM	LF	LH	LS			
WRX3040RH27W40	❑	40	27	40	180	60	120	6	2	3
WRX3040RH40W40	●	40	40	40	150	65	85	9	3	3
WRX3050RH27W40	❑	50	27	40	180	60	120	8	2	4
WRX3050RH53W40	●	50	53	40	165	75	90	12	4	3

Spare Parts (WRX 3000)

Screw	Wrench
	
BFTX 0409 IP	TRDR 15 IP

Inserts (Same as for Wavemill WEX 3000 Type)



Application	Coated Carbide							Carbide	DLC	
High Speed / Light cut	P			K		M S		K N	N	
General Purpose		P		K		M S	M S		N	
Roughing		P	P		K		M S			
Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	ACM200	ACM300	H1	DL1000	Radius RE
AXMT 170508 PEER-L	▲	▲	▲	▲	▲			–	–	0,8
AXMT 170504 PEER-G	▲	▲	▲	▲	▲			–	–	0,4
170508 PEER-G	▲	▲	▲	▲	▲			–	–	0,8
170512 PEER-G	▲	▲	▲	▲	▲			–	–	1,2
170516 PEER-G	❍	▲	▲	▲	▲			–	–	1,6
170520 PEER-G*	▲	▲	▲	▲	▲			–	–	2,0
170530 PEER-G*	▲	▲	▲	▲	▲			–	–	3,0
AXMT 170508 PEER-H	▲	▲	▲	▲	▲			–	–	0,8
170512 PEER-H	▲	▲	▲	▲	▲			–	–	1,2
AXMT 170504 PEER-E						▲	▲	–	–	0,4
170508 PEER-E						▲	▲	–	–	0,8
170512 PEER-E						▲	▲	–	–	1,2
170516 PEER-E						▲	▲	–	–	1,6
170520 PEER-E*						▲	▲	–	–	2,0
170530 PEER-E*						▲	▲	–	–	3,0
AXMT 170508 PEER-EH			▲			▲	▲	–	–	0,8
AXET 170502 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,2
170504 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,4
170508 PEFR-S	–	–	–	–	–	–	–	▲	▲	0,8

L – Low cutting force
G – General type
H – Strong cutting edge
E – For stainless steel
EH– Strong edge for stainless steel
S – For aluminium
* Cutter body modification is required.

– Unable to produce

Application Examples

Example 1

Work Material	Automotive Component / Cast Iron		
Tool	Body	Sumitomo	Competitor
		WRX3000 Type Integrated Arbor	Ø 50
	Insert	AXMT	18 mm
	Insert grade	ACK300	PVD Type
	Tool dia. (mm)	50	50
	Total teeth	15	12
	Effective teeth	3	3
Cutting Data	Cutting speed (m/min)	78	78
	Feed (mm/t)	0,13	0,13
	Axial depth of cut (mm)	45	45
	Radial width of cut (mm)	5	5
	Coolant	Dry	Dry
Result	Tool life / Cutting edge	500 min	300 min
Benefits	1,7 times longer tool life		

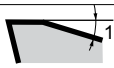
Example 2

Work Material	Machine Parts / Stainless Steel		
Tool	Body	Sumitomo	Competitor
		WRX3040RH40E40	Ø 40
	Insert	AXMT	18 mm
	Insert grade	ACP300	PVD Type
	Tool dia. (mm)	40	40
	Total teeth	9	6
	Effective teeth	3	2
Cutting Data	Cutting speed (m/min)	125	125
	Feed (mm/t)	0,2	0,2
	Axial depth of cut (mm)	40	40
	Radial width of cut (mm)	5	5
	Coolant	Wet	Wet
Result	Tool life / Cutting edge	20	5 ~ 10
Benefits	Stable machining, double tool life with no breakage		

→ G59

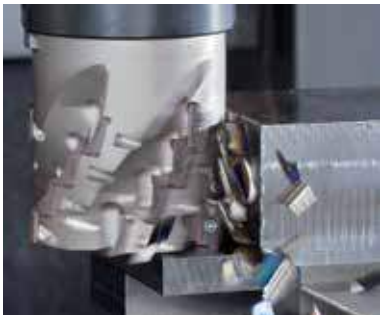
● = Euro stock
❍ = Japan stock
❑ = Delivery on request
▲ = To be replaced by new item
N·m Recommended Tightening Torque (N·m)

Chipbreaker Selection

Work Material	Steel, Cast Iron			Stainless Steel		Aluminium
Chipbreaker Type	L	G	H	E	EH	S
Feature	Low cutting force	General purpose	Strong cutting edge	E type for smooth cutting	Strong cutting edge	Sharp cutting edge
2000 Type Figure	–	28°	20°	 17°	17°	27°
3000 Type Figure	25°	20°	5°	14°	8°	30°
Application	Light cut, low rigidity milling and less burrs	General to Interrupted milling	Roughing, heavy interrupted and hardened steel milling	Light cutting to general purpose	Heavy interrupted machining	Aluminium alloy and non-ferrous metal

Ramping (Slant Milling)

Tool Diameter	Max. Ramping Angle	
	WRX 2000 Typ	WRX 3000 Typ
20	4°	
25	2°	
32	1°30'	
40	1°	2°
50	0°30'	1°
63		0°30'
80		0°30'
100		Not possible



Recommended Cutting Conditions

Tool: WRX 3050 RH53 F22, DC = 50 mm, a_p = 50 mm

ISO	Work Material	Property, Condition	Hardness (HB)	Grades (optimum grade in bold letters)			Chip Breaker	Recommended cutting speed and feed / tooth according to width of cut (a_e /DC) - must be adjusted to actual machine and workpiece conditions.					
								10%		25%		> 50%	
								v_c	f_z	v_c	f_z	v_c	f_z
								min. **Optimum** max.	min. **Optimum** max.	min. **Optimum** max.	min. **Optimum** max.	min. **Optimum** max.	min. **Optimum** max.
P	Steel, carbon steel	< 0,15% C, annealed	125	ACP 100	**ACP 200**	ACP 300	L - **G**	170 – **215** – 240	0,21 – **0,28** – 0,35	160 – **195** – 220	0,16 – **0,21** – 0,26	130 – **160** – 180	0,08 – **0,10** – 0,13
P	Steel, carbon steel	< 0,45% C, annealed	190	ACP 100	**ACP 200**	ACP 300	L - **G**	160 – **195** – 220	0,21 – **0,28** – 0,35	140 – **175** – 190	0,16 – **0,21** – 0,26	110 – **140** – 160	0,08 – **0,10** – 0,13
P	Steel, carbon steel	< 0,45% C, tempered	250	ACP 100	**ACP 200**	ACP 300	L - **G** - H	140 – **180** – 200	0,19 – **0,26** – 0,32	130 – **165** – 180	0,14 – **0,19** – 0,24	100 – **130** – 140	0,08 – **0,10** – 0,13
P	Steel, carbon steel	< 0,75% C, annealed	270	ACP 100	**ACP 200**	ACP 300	L - **G** - H	140 – **170** – 190	0,19 – **0,26** – 0,32	120 – **155** – 170	0,14 – **0,19** – 0,24	100 – **130** – 140	0,07 – **0,10** – 0,12
P	Steel, carbon steel	< 0,75% C, tempered	300	ACP 100	**ACP 200**	ACP 300	L - **G** - H	130 – **165** – 180	0,19 – **0,26** – 0,32	120 – **150** – 170	0,14 – **0,19** – 0,24	100 – **120** – 130	0,07 – **0,10** – 0,12
P	Low alloyed steel	annealed	180	ACP 100	**ACP 200**	ACP 300	**G** - H	130 – **165** – 180	0,18 – **0,24** – 0,30	120 – **150** – 170	0,13 – **0,18** – 0,22	100 – **120** – 130	0,07 – **0,09** – 0,11
P	Low alloyed steel	tempered	275	ACP 100	**ACP 200**	ACP 300	**G** - H	130 – **160** – 180	0,17 – **0,23** – 0,28	120 – **145** – 160	0,12 – **0,16** – 0,20	100 – **120** – 130	0,07 – **0,09** – 0,11
P	Low alloyed steel	tempered	300	ACP 100	**ACP 200**	ACP 300	**G** - H	110 – **140** – 160	0,16 – **0,22** – 0,27	100 – **130** – 140	0,11 – **0,15** – 0,19	90 – **110** – 120	0,07 – **0,09** – 0,11
P	Low alloyed steel	tempered	350	ACP 100	**ACP 200**	ACP 300	**G** - H	100 – **130** – 140	0,16 – **0,21** – 0,26	100 – **120** – 130	0,11 – **0,15** – 0,19	80 – **100** – 110	0,06 – **0,08** – 0,10
P	High alloyed and tool steel	annealed	200	**ACP 100**	ACP 200		G - **H**	70 – **85** – 90	0,15 – **0,21** – 0,26	60 – **80** – 90	0,11 – **0,14** – 0,18	60 – **70** – 80	0,06 – **0,08** – 0,10
P	High alloyed and tool steel	tempered	325	**ACP 100**	ACP 200		G - **H**	30 – **35** – 40	0,14 – **0,19** – 0,24	30 – **35** – 40	0,10 – **0,14** – 0,17	20 – **30** – 30	0,06 – **0,08** – 0,10
M	Stainless steel, ferritic/martensitic	annealed	200		ACP 200	**ACP 300**	L - **G** - H	120 – **150** – 170	0,15 – **0,20** – 0,25	110 – **135** – 150	0,11 – **0,14** – 0,18	90 – **110** – 120	0,07 – **0,09** – 0,11
M	Stainless, martensitic	tempered	240		ACP 200	**ACP 300**	L - **G** - H	100 – **125** – 140	0,16 – **0,22** – 0,27	90 – **115** – 130	0,12 – **0,16** – 0,20	80 – **100** – 110	0,07 – **0,10** – 0,12
M	Stainless, austenitic	plunged	180		ACM 200	**ACM 300**	L - **G**	80 – **95** – 110	0,15 – **0,20** – 0,25	70 – **85** – 90	0,11 – **0,14** – 0,18	60 – **70** – 80	0,06 – **0,08** – 0,10
K	Gray cast iron	GG	180	**ACK 200**	ACK 300		**G** - H	190 – **240** – 270	0,19 – **0,26** – 0,32	180 – **220** – 240	0,14 – **0,19** – 0,24	140 – **170** – 190	0,09 – **0,12** – 0,15
K	Nodular cast iron	GGG	250	**ACK 200**	ACK 300		**G** - H	140 – **170** – 190	0,16 – **0,21** – 0,26	120 – **155** – 170	0,12 – **0,16** – 0,20	100 – **130** – 140	0,07 – **0,10** – 0,12
S	Exotic alloys (Resistant alloys, Ti + Ni alloys)	Fe based, annelaed	200	ACK 200	**ACK 300**		L - **G**	40 – **45** – 50	0,12 – **0,16** – 0,21	30 – **40** – 45	0,08 – **0,11** – 0,14	30 – **35** – 40	0,07 – **0,09** – 0,11
S	Exotic alloys (Resistant alloys, Ti + Ni alloys)	hardened	280	ACK 200	**ACK 300**		L - **G**	15 – **20** – 25	0,10 – **0,14** – 0,17	10 – **15** – 20	0,07 – **0,10** – 0,12	10 – **15** – 20	0,05 – **0,07** – 0,09
N	Aluminum alloy	Si < 13%			**DL 1000**	H1	**S**	510 – **635** – 710	0,23 – **0,31** – 0,38	460 – **580** – 640	0,17 – **0,22** – 0,28	390 – **485** – 540	0,08 – **0,12** – 0,14
N	Aluminum alloy	Si ≥ 13%			**DL 1000**	H1	**S**	150 – **190** – 210	0,19 – **0,25** – 0,32	140 – **175** – 190	0,14 – **0,18** – 0,23	130 – **165** – 180	0,08 – **0,10** – 0,13
N	Copper alloy				**DL 1000**	H1	**S**	320 – **405** – 450	0,15 – **0,21** – 0,26	300 – **370** – 410	0,13 – **0,16** – 0,22	240 – **300** – 330	0,07 – **0,10** – 0,12

- Dry machining is recommended (air cooling) - if lubricant is used, we recommend CVD coated grades (ACP100 / ACK200) or tough PVD grades (ACP300 / ACK300).
- Insert geometry: L type for low cutting forces, thinly coated components. G type for general application, H type offers high cutting edge stability for rough and heavy cutting conditions.

MTIX 16000 Type

New

General Features

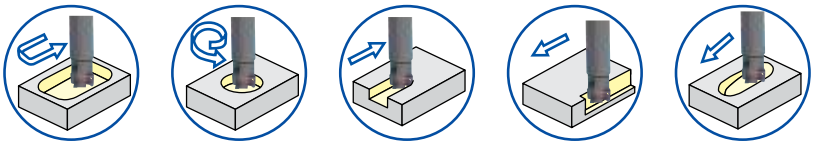
Stable and Reliabel Tool Life in Titanium Roughing

With combination of high toughness grade ACM300 and optimized cutting edge shape, stable and reliable tool life are achieved in roughing application of Titanium.

Suitable for Titanium Structure Parts for Aircraft

MTIX cutter with wide range of insert nose-radius and large ramping angle availiability is suitable for variable application of titanium structure parts for aircraft.

Large Application Range



ISO	Grade	Coating Thickness (μm)	Features
S	ACM300	3	Realises superb stability in machining of Titanium, due to a high-strength carbide substrate and highly chipping-resistance coating.

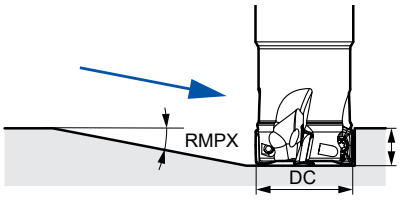
Recommended Cutting Conditions

Min. - **Optimum** - Max.

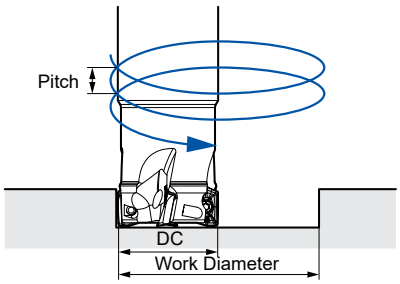
ISO	Material	Cutting Speed (m/min)	Feed Rate (mm/t)	a_p (mm)	Grade
S	Titanium	30–**60**–90	0,05–**0,10**–0,15	<13	ACM300

Ramping / Helical Milling Upper Limits

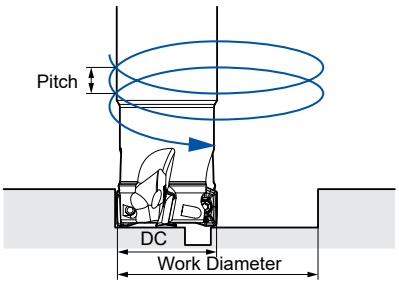
Ramping



Flat Bottom Machining



Machining with Prepared Hole



Tools		Ramping
DC Ø (mm)	Nose Radius	Max. RMPX (°)
Ø 32	RE ≥ 5,0	8,4
	RE ≤ 4,0	12,2
Ø 50	RE ≥ 5,0	3,6
	RE ≤ 4,0	5,6
Ø 63	RE ≥ 5,0	2,5
	RE ≤ 4,0	3,9

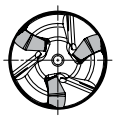
Tools		Flat Bottom Machining				Machining with Prepared Hole	
DC Ø (mm)	Nose Radius	Max. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)	Min. Machining Diam. (mm)	Max. Pitch (mm/rev)
Ø 32	4,0	55,3	13,0	55,2	13,0	45,9	3,0
	0,8	61,3	13,0	56,3	13,0	45,9	2,9
Ø 50	4,0	91,6	11,2	91,6	11,2	81,9	2,8
	0,8	97,3	13,0	92,2	11,0	81,9	2,7
Ø 63	4,0	117,6	10,1	117,6	10,1	107,9	2,7
	0,8	123,3	11,7	118,2	9,9	107,9	2,6

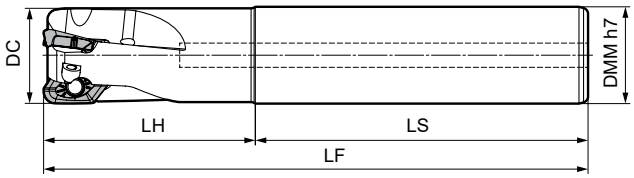
● = Euro stock

Recommended Tightening Torque (N·m)

Rake Angle	Radial	-9° – -6°
	Axial	8° – 14°

13 mm 90°





Body - MTIX (Shankl Type)

Dimensions (mm)

Insert Radius RE	Cat. No.	Stock	DC	DMM	LF	LH	LS	No. of Teeth	Weight (kg)
≤ 4,0	MTIX 16032E03	●	32	32	180	70	110	3	0,96
≥ 5,0	MTIX 16032E03-5,0	●	32	32	180	70	110	3	0,96

Inserts are sold separately.

→ G61

Spare Parts

Applicable Cutters	Insert Screw		Wrench	Handle Grip	Wrench Bit
MTIX 16032E03(-5,0)	BFTX0409IP	3,0	TRDR15IP	–	–

Identification Details

MTIX	16	032	E	05
Cutter Series	Insert Size	Cutter Diameter	Round Shank	Number of Teeth

Inserts

Dimensions (mm)

Application	Coated Carbide
High Speed / Light Cut	
General Purpose	S
Roughing	S

Cat. No.	ACM300	RE	Fig.
XOMT 160508PEER-E	●	0,8	1
160512PEER-E	●	1,2	1
160516PEER-E	●	1,6	1
160520PEER-E	●	2,0	1
160530PEER-E	●	3,0	1
160540PEER-E	●	4,0	1
160550PEER-E	●	5,0	2
160560PEER-E	●	6,0	2
160564PEER-E	●	6,35	2

Fig. 1

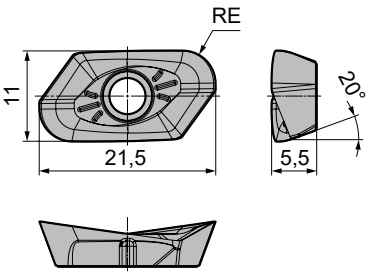
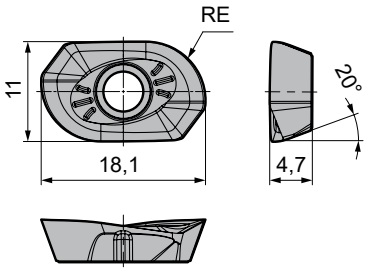


Fig. 2



Inserts with nose radius of RE ≥ 5,0 are for use with bodies that have a "-5,0" part number suffix

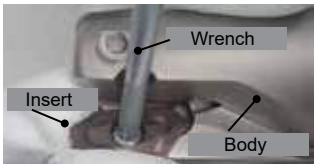
Precautions for Mounting

(1) Clean the mounting seat and contact parts.

(2) Apply screw lubrication to the screw thread as well as the screw head face to prevent seizure.

(3) While pressing the insert solidly against the seat surface, tighten at the screws with the included wrench.

(4) After tightening, check that there are no gaps between the surfaces.

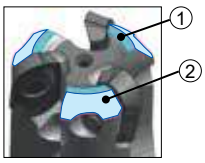


Cutter Body	MTIX16 ____	MTIX16 ____-5,0
Insert Radius RE ≤ 4,0 mm	OK	Not recommended. The insert has no support from the cutter body.
Insert Radius RE ≥ 4,0 mm	OK with modification 1,5 mm less height	OK

Modification method

① Grind 1,5 mm from top

② Add chamfer 4,5 mm



"Wave Ball Mill" for Roughing
WBMR Type

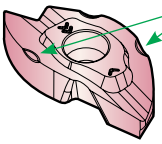
■ Features

Particularly suitable for die mold machining the WBMR replaceable insert ball nose endmill efficiently roughs complex profiles.

Its high feed rate capability is a direct result of a sharp cutting edge which is maintained during the cutting cycle by the special cemented carbide substrate working in parallel with the ultra hard ZX coating.

■ Advantages

- Wave shaped cutting edge
- Economical M class insert
- Precise clamping
- High feed rate capability

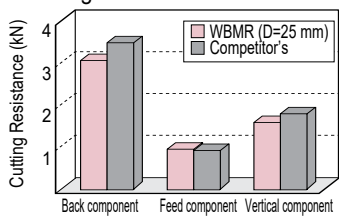


Chipbreaker
(Nick type)
for r = 25
radial insert

ZNMT 4310250-N

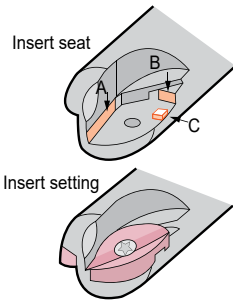
■ Performance

● Cutting Resistance



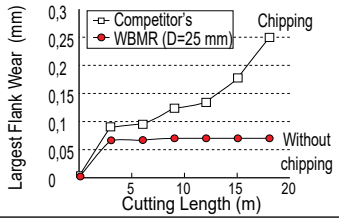
Cutting Conditions (Shoulder milling, downcut)
v_c = 200 m/min, f_z = 0.15 mm/tooth
Axial a_p: 5 mm, Radial a_e: 5 mm
Work Material : C50

● Anti-Rotational Mechanism



Circumferential movement of the insert caused by cutting forces is controlled by guide faces A, B & C, so as to allow stable cutting.

● Insert Life

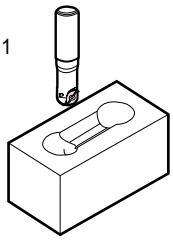


Cutting Conditions (Shoulder milling, downcut)
v_c = 100 m/min, f_z = 0.15 mm/tooth
Axial a_p: 5mm, Radial a_e: 5 mm
Work Material : X40CrMoV5-1(HRC45)

■ Application Example

● Cold Molding Die

Work Material :
X155CrVMo12 1



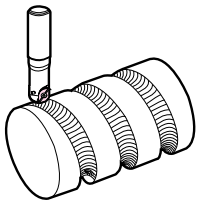
<Results>
Flank wear after continuous cutting for seven hours was less than other manufacturer's product.
Stable cutting was observed.

WBMR 2200S (ø 20 mm)
Insert Grade : ACZ350

Cutting Conditions :
n = 2200 rpm, v_f = 500 mm/min
Depth of Cut : 0,3–2 mm
Non-water soluble cutting oil

● Injection Molded Part

(Cr-Mo steel + Stellite-overlay)



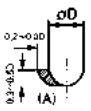
<Results>
Wave ball (ø30mm) could cut without chattering while other manufacturer's products could not cut at all due to chattering.

WBMR 2300M (ø 30 mm)
Insert Grade : ACZ350

Cutting Conditions :
n = 500 rpm, v_f = 35 mm/min
Depth of Cut : 5 mm
Dry cut

■ Recommended Cutting Conditions (2 teeth)

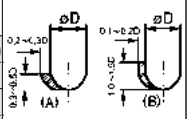
Condition \ Material		Carbon steel (Below HRC25)	Alloy steel (Below HRC45)	Stainless, Die steel etc.	Cast iron
(A)	v_c	200-**250**-300	100-**150**-200	50-**80**-100	100-**120**-150
	f_z	0,1-**0,2**-0,3	0,1-**0,2**-0,3	0,1-**0,15**-0,2	0,2-**0,3**-0,4



[v_c =m/min, f_z =mm/tooth] [min.– optimum – max.]

■ Recommended Cutting Conditions (4 teeth)

Condition \ Material		Carbon steel (Below HRC25)	Alloy steel (Below HRC45)	Stainless, Die steel etc.	Cast iron
(A)	v_c	200-**250**-300	100-**150**-200	50-**80**-100	100-**120**-150
	f_z	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_c	160-**200**-240	80-**120**-160	40-**60**-80	80-**100**-120
	f_z	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_c =m/min, f_z =mm/tooth] [min.– optimum – max.]

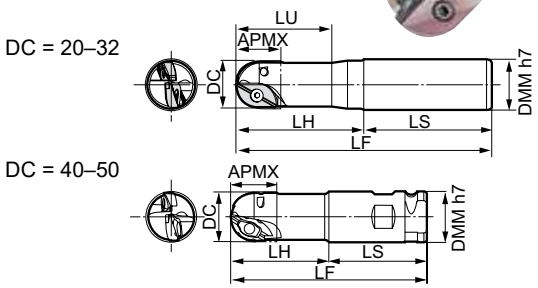
● = Euro stock
○ = Japan stock

Recommended Tightening Torque (N·m)

"Wave Ball Mill" for Roughing
WBMR 2000

Rake Angle	Radial	–
	Axial	-10°

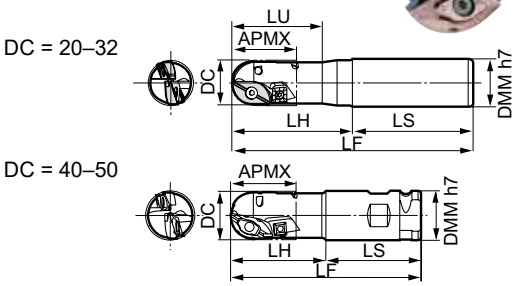
20–47mm



"Wave Ball Mill" for Roughing
WBMR 2000 L

Rake Angle	Radial	–
	Axial	-10°

30–69mm



■ Body (Short and middle length type, 2 teeth)

Cat. No.	Stock	Dimensions (mm)						
		DC	DMM	APMX	LH	LS	LU	LF
WBMR 2200 S	●	20	25	20	60	80	40	140
2200 M	●	20	25	20	60	140	40	200
2200 MW	●	20	25	20	60	140	40	200
WBMR 2250 S	●	25	32	23	70	80	50	150
2250 M	●	25	32	23	73	147	50	220
2250 MW	●	25	32	23	73	147	50	220
WBMR 2320 S	●	32	32	31	80	80	60	160
2320 M	●	32	32	31	85	155	60	240
2320 MW	●	32	32	31	85	155	60	240
WBMR 2400 S	❍	40	42	35	100	100	-	200
2400 M	❍	40	42	35	180	100	-	280
WBMR 2500 S	❍	50	42	47	100	100	-	200
2500 M	❍	50	42	47	180	100	-	280

S: **S**hort type with cylindrical shank
M: **M**iddle length type with cylindrical shank

MW: **M**iddle length type with Weldon shank

■ Body (Extra long type, 4 teeth)

Cat. No.	Stock	Dimensions (mm)						
		DC	DMM	APMX	LH	LS	LU	LF
WBMR 2200 LL	●	20	25	30	80	170	40	250
2200 LLW	●	20	25	30	80	170	40	250
WBMR 2250 LL	❍	25	32	38	100	200	50	300
2250 LLW	●	25	32	38	100	200	50	300
WBMR 2320 LL	●	32	32	44	120	230	60	350
2320 LLW	●	32	32	44	120	230	60	350
WBMR 2400 LL	❍	40	42	50	250	100	-	350
2400 LLW		40	42	50	250	100	-	350
WBMR 2500 LL	❍	50	42	69	250	100	-	350
2500 LLW		50	42	69	250	100	-	350

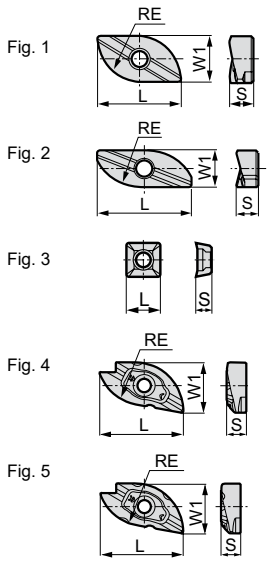
LL: Extra long type with cylindrical shank

LLW: Extra long type with Weldon shank

■ Inserts

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

Cat. No.	ACP200	ACP300	ACK300	Dimensions (mm)				Fig.	No. of teeth	Applicable Endmill
				L	W1	S	RE			
ZNMT 1804100-C	●	●	●	18,00	9,76	4,76	10,0	1	1	WBMR 2200
2004100-S	●	●	●	20,00	7,50	4,37	10,0	2	1	
SPMT 070308	❍	❍		7,94	-	3,18	-	3	2	
ZNMT 2205125-C	●	●	●	22,50	12,20	5,70	12,5	1	1	WBMR 2250
2305125-S	●	●	●	23,00	9,38	5,56	12,5	2	1	
SPMT 09T308	●	●	●	9,53	-	3,97	-	3	2	
ZNMT 2907160-C	●	●	●	29,00	15,62	7,15	16,0	1	1	WBMR 2320
3006160-S	●	●	●	30,00	12,00	6,70	16,0	2	1	
SPMT 09T308	●	●	●	9,53	-	3,97	-	3	2	
ZNMT 3608200	❍	❍	❍	36,00	19,50	6,70	20,0	4	2	WBMR 2400
SPMT 09T308	●	●	●	9,53	-	3,97	-	3	2	
ZNMT 4310250	❍		❍	43,00	25,70	10,15	25	4	2	WBMR 2500
4310250-N	❍		❍	43,00	25,70	10,15	25	5	2	
SPMT 120408	❍	❍	❍	12,7	-	4,76	-	3	2	



■ Spare Parts

Screw		Wrench	Wrench	Applicable Endmill
	N·m			
BFTX 0307N	2,0	TRX10	–	WBMR 2200, WBMR 2200 LL
BFTX 0409N	3,4	–	TRD15	WBMR 2250, WBMR 2250LL
BFTX 0511N	5,0	–	TRD20	WBMR 2320, WBMR 2320LL
BFTX 0407N	3,0	–	TRD15	WBMR 2320LL
BFTX0619N	7,5	–	TRD25	WBMR 2400, WBMR 2500, WBMR 2400LL, WBMR 2500LL
BFTX 0409N	3,4	–	TRD15	WBMR 2500LL

"Wave Ball Mill" for Finishing
WBMF Type

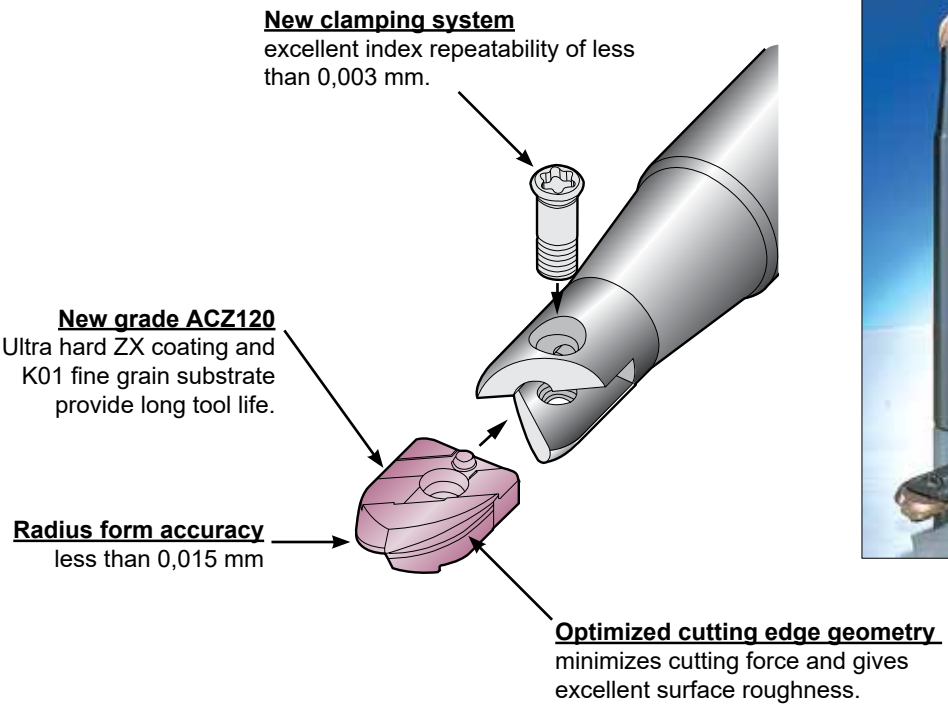
■ Features

The outstanding results obtained from this finishing cutter are due to the combination of its large sigmoid blade and precise clamping system making it extremely rigid !

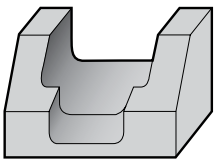
The WBMF achieves an excellent machined finish greatly reducing hand finishing and polishing operations.

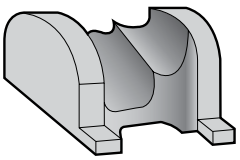
■ Advantages

- Unique rigid clamping system
- Large sigmoid blade
- Smooth cutting action
- High quality machined surface
- Ultra hard ZX coated cutting edge



■ Application Example

● Bumper Moulding Die Work Material : C55 	<Results> Surface roughness after continuous cutting for twelve hours was better than other manufacturer's product. Less width of flank wear was observed.
WBMF1200M (ø20mm) Insert : ZPGU2471100 Grade : ACZ120	Cutting Conditions v_c = 88 m/min v_f = 700 mm/min (f_z = 0,25 mm/tooth) Width of Cut : 0,5 mm Depth of Cut : 0,5 mm Dry

● Bumper Moulding Die Work Material : C50 	<Results> Smooth cutting and good surface finish after continuous cutting for eight hours
WBMF1200M (ø20mm) Insert : ZPGU2471100 Grade : ACZ120	Cutting Conditions v_c = 190 m/min v_f = 1200 mm/min (f_z = 0,21 mm/tooth) Width of Cut : 0,2 mm Depth of Cut : 0,2 mm Dry

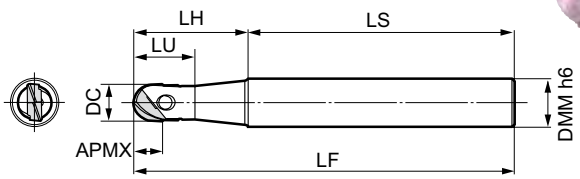
● = Euro stock
○ = Japan stock

Recommended Tightening Torque (N·m)

WBMF 1000

Rake Angle	Radial	–
	Axial	0°

0,1–0,4mm



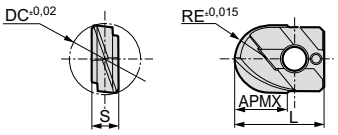
Body

Cat. No.		Stock	Dimensions (mm) DC	DMM	APMX	LH	LS	LU	LF
WBMF	1100 S	❍	10	16	9	30	70	17	100
	1100 M	●	10	16	9	35	95	17	130
	1100 L	❍	10	16	9	50	130	17	180
WBMF	1120 S	❍	12	16	10,5	40	70	19,5	110
	1120 M	●	12	16	10,5	40	110	19,5	150
	1120 MM12N		12	12	10,5	40	110	19,5	150
	1120 L	❍	12	16	10,5	60	140	19,5	200
WBMF	1160 S	❍	16	20	12	50	80	25,5	130
	1160 M	●	16	20	12	50	130	25,5	180
	1160 MM12N		16	16	12	50	130	25,5	180
	1160 L	❍	16	20	12	70	150	25,5	220
WBMF	1200 S	❍	20	25	15	60	80	32	140
	1200 M	●	20	25	15	60	140	32	200
	1200 MM20N		20	20	15	60	140	32	200
	1200 L	❍	20	25	15	80	170	32	250
WBMF	1250 S	❍	25	32	18,5	70	80	36	150
	1250 M	●	25	32	18,5	73	147	36	220
	1250 L	❍	25	32	18,5	100	200	36	300
WBMF	1300 S		30	32	22,5	80	80	43	160
	1300 M	●	30	32	22,5	85	155	43	240
	1300 L		30	32	22,5	120	230	43	350

S : **S**hort type
M : **M**iddle length type
L : **L**ong type

Inserts

Application	Coated
High Speed / Light cut	P
General Purpose	
Roughing	



Cat. No.	ACZ120	Dimensions (mm) DC	L	APMX	S	RE	Applicable Endmill
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

Spare Parts

Screw		Wrench	Applicable Endmill
	N·m		
BFTG0408F	3,4	TRD15	WBMF1100
BFTG0409F	3,4	TRD15	WBMF1120
BFTG0513F	5,0	TRD20	WBMF1160
BFTG0617F	7,5	TRD25	WBMF1200
BFTG0621F	7,5	TRD25	WBMF1250
BFTG0825F	7,5	TRD25	WBMF1300

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Insert Grade
P	Carbon Steel	180–280 HB	200–**250**–300	0,10–**0,20**–0,30	ACZ210
	Alloy Steel	180–280 HB	100–**150**–200	0,10–**0,20**–0,30	ACZ210

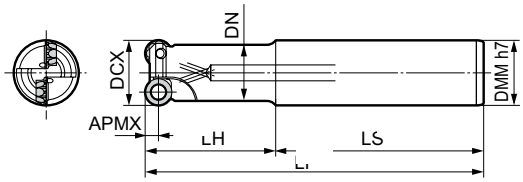
Min.–**Optimum**–Max.

Shank Type with Small Diameter Inserts

4,0 mm (WRCX 08000) 5,0 mm (WRCX 10000)

E_ : Cylindrical straight shank type

ES : **S**hort type with straight shank
EM : **M**iddle length type with straight shank
EL : **L**ong type with straight shank



Axial rake angle: – 3°
Radial rake angle: 0 – 35°

Body

Spare Parts

Cat. No.	Stock	Dimensions (mm) DCX	DMM	DN	APMX	LF	LH	LS	No. of teeth	Axial Rake	Radial Rake	Helical Boring øB Standard	Plunging α max.	Spare Parts	N·m	
WRCX 08012 ES	●	12	12	9,4	4	110	40	70	1	-3°	-35°	-	0°30'	BFTX 02505 IP	1,5	TRDR 08 IP
08012 EM		12	12	9,4	4	150	70	80	1							
WRCX 08016 ES	●	16	16	14	4	120	50	70	1	-3°	-10°	24^{+7}_{-4}	5°30'	BFTX 02506 IP	1,5	TRDR 08 IP
08016 EM	●	16	16	14	4	150	70	80	1							
WRCX 08020 ES	●	20	20	18	4	130	50	80	2	-3°	-3°	$32^{\pm7}$	13°			
08020 EM	●	20	20	18	4	180	100	80	2							
08020 EL	●	20	20	18	4	250	130	120	2							
WRCX 08025 ES	●	25	25	21	4	130	50	80	3	-3°	0°	$42^{\pm7}$	8°20'			
08025 EM	●	25	25	21	4	180	100	80	3							
08025 EL	●	25	25	21	4	250	130	120	3							
WRCX 10025 ES	●	25	25	21	5	130	50	80	2	-3°	0°	$40^{\pm8}$	13°10'	BFTX 03584 IP	3,0	TRDR 15 IP
10025 EM	●	25	25	21	5	180	100	80	2							
10025 EL	●	25	25	21	5	250	130	120	2							
WRCX 10032 ES	●	32	32	28	5	130	50	80	3	-3°	0°	$54^{\pm8}$	8°			
10032 EM	●	32	32	28	5	200	120	80	3							
10032 EL	●	32	32	28	5	300	180	120	3							

Inserts

Application	Coated Carbide					Uncoated Carbide	Diamond Coated
High Speed / Light cut	P			K		K/N	N
General Purpose		P/M	P/M	K			N
Roughing		P/M	P/M		K		

Cat. No.	ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Dimensions (mm) IC	RE	S	Fig.	Applicable Endmill
QPMT 080330 PPEN		●	●	●	●			8	3,0	3,18	1	WRCX 08000 E
080330 PPEN-H	●	●	●	●	●			8	3,0	3,18	1	
QPMT 10T335 PPEN		●	●	●	●			10	3,5	3,97	1	WRCX 10000 E
10T335 PPEN-H	●	●	●	●	●			10	3,5	3,97	1	
QPET 10T350 PPFR-S						●	●	10	5,0	3,97	2	

Fig. 1

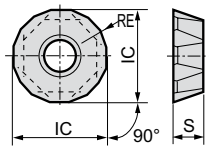
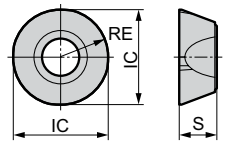


Fig. 2



QPMT... : Standard 16 cornered polygon type
QPMT...-H: Stronger cutting edge type

QPET...-S: Polished round insert for non-ferrous material

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Insert Grade
P	Carbon Steel	180–280 HB	80–**120**–160	0,10–**0,30**–0,40	ACP200
	Alloy Steel	180–280 HB	60–**100**–140	0,10–**0,20**–0,30	ACP200
M	Stainless Steel	–	60–**100**–120	0,10–**0,15**–0,20	ACP300
K	Cast Iron	250 HB	60– **80**–120	0,10–**0,20**–0,30	ACK200
N	Non-ferrous Alloys	–	200–**500**–1.000	0,10–**0,20**–0,30	DL1000

Min.–**Optimum**–Max.

● = Euro stock

→ G17

N·m Recommended Tightening Torque (N·m)

WRCX 0800/10000/12000 M

Modular Type

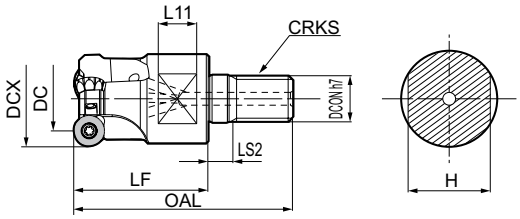
Rake Angle		
	Radial	-3°– 0°
	Axial	-3°

4,0 mm (WRCX 08000M) | 5,0 mm (WRCX 10000M) | 6,0 mm (WRCX 12000M)

(WRCX 08000M)

(WRCX 10000M)

(WRCX 12000M)



Heads

For insert type : QPMT 0803

Cat. No.	Stock	Dimensions (mm)									No. of teeth
		DCX	DCON	CRKS	OAL	LF	LS2	LS	L11	H	
WRCX 08020M10Z2	●	20	10,5	M10	49	30	5	19	8	15	2
WRCX 08025M12Z3	●	25	12,5	M12	56	35	5	21	10	19	3

Inserts are not included.

Heads

For insert type : QP○T 10T3

Cat. No.	Stock	Dimensions (mm)									No. of teeth
		DCX	DCON	CRKS	OAL	LF	LS2	LS	L11	H	
WRCX 10025M12Z2	●	25	12,5	M12	56	35	5	21	10	19	2
10028M12Z3		28	12,5	M12	56	35	5	21	10	19	2
WRCX 10030M16Z3		30	17,0	M16	63	40	5	23	10	24	3
10032M16Z3	●	32	17,0	M16	63	40	5	23	10	24	3

Inserts are not included.

Identification Details

WRCX	08	020	M10	Z2
Cutter Type	Insert Size	Diameter	Mounting Screw	No. of Teeth

Heads

For insert type : QP○T 1204

Cat. No.	Stock	Dimensions (mm)									No. of teeth
		DCX	DCON	CRKS	OAL	LF	LS2	LS	L11	H	
WRCX 12040M16Z4	❍	40	17,0	M16	63	40	5	23	10	24	4

Inserts are not included.

Inserts

Application	Coated Carbide					Uncoated carbide	Diamond Coated
High Speed / Light cut	P			K		K N	N
General Purpose		P M	P M	K			N
Roughing		P M	P M		K		

QPMT... : 16 corner insert for general purpose application
QPMT...-H: 16 corner insert with strong cutting edge

QPET...-S: Round insert with sharp cutting edge for aluminium

Cat. No.		ACP100	ACP200	ACP300	ACK200	ACK300	H1	DL1000	Dimensions (mm) IC	RE	S	Fig.	Applicable Endmill
QPMT	080330 PPEN		●	●	●	●			8	3,0	3,18	1	WRCX 08000 M
	080330 PPEN-H	●	●	●	●	●			8	3,0	3,18	1	
QPMT	10T335 PPEN		●	●	●	●			10	3,5	3,97	1	WRCX 10000 M
	10T335 PPEN-H	●	●	●	●	●			10	3,5	3,97	1	
QPET	10T350 PPFR-S						●	●	10	5,0	3,97	2	
QPMT	120440 PPEN	●	●	●	●	●			12	4,0	4,76	1	WRCX 12000 M
	120440 PPEN-H	●	●	●	●	●			12	4,0	4,76	1	
QPET	120460 PPFR-S						●	●	12	6,0	4,76	2	

Fig. 1

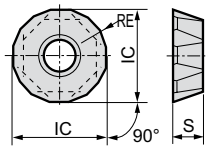
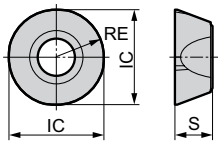


Fig. 2



Spare Parts

Screw		Wrench	Applicable Endmill
BFTX 02506 IP	1,5	TRDR 08 IP	WRCX 08020M – WRCX 08025M

Spare Parts

Screw		Wrench	Applicable Endmill
BFTX 03584 IP	3,0	TRDR 15 IP	WRCX 10025M – WRCX 10032M
BFTX 0409 IP	3,0	TRDR 15 IP	WRCX 12040M

Recommended Cutting Conditions

Diameter Ø20 – Ø32 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Insert Grade
P	Carbon Steel	180–280 HB	80–**120**–160	0,10–**0,30**–0,40	ACP200
	Alloy Steel	180–280 HB	60–**100**–140	0,10–**0,20**–0,30	ACP200
M	Stainless Steel	–	60–**100**–120	0,10–**0,15**–0,20	ACP300
K	Cast Iron	250 HB	60– **80**–120	0,10–**0,20**–0,30	ACK200
N	Non-ferrous Alloys	–	200–**500**–1.000	0,10–**0,20**–0,30	DL1000

Min.–**Optimum**–Max.

Diameter Ø40 mm

ISO	Work Material	Hardness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Insert Grade
P	Carbon Steel	180–280 HB	100–**160**–200	0,20–**0,40**–0,60	ACP200
	Alloy Steel	180–280 HB	100–**140**–180	0,20–**0,30**–0,40	ACP200
M	Stainless Steel	–	80–**120**–160	0,10–**0,20**–0,30	ACP300
K	Cast Iron	250 HB	80–120–160	0,10–**0,20**–0,40	ACK200
N	Non-ferrous Alloys	–	200–**500**–1.000	0,10–**0,30**–0,40	DL1000

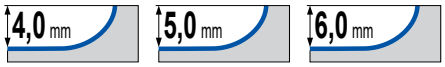
Min.–**Optimum**–Max.

"Wave Radius Mill"
RSX(F)08000/10000/12000ES

Milling of steel, stainless steel, cast iron and exotic alloys

Shank Type

Rake Angle		
	Radial	-5°– -8°
	Axial	10°



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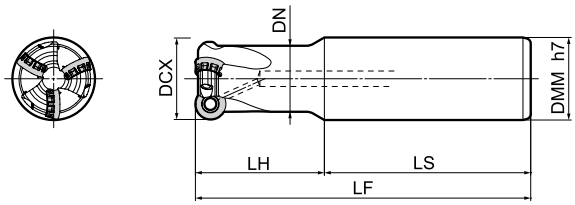


Body (RSX...ES, Standard)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	Weight (kg)
		DCX	DMM	DN	LH	LS	LF		
RSX 08020 ES	●	20	20	16,9	30	70	100	2	0,3
08025 ES	●	25	25	21,9	40	80	120	3	0,4
RSX 10025 ES	●	25	25	20,3	50	80	130	2	0,4
10032 ES	●	32	32	27,1	50	80	130	3	0,7
RSX 12032 ES	●	32	32	25,6	50	80	130	2	0,7

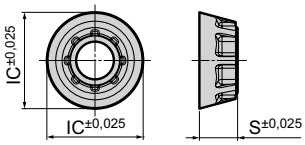
Body (RSXF...ES, Fine Pitch)

Cat. No.	Stock	Dimensions (mm)						No. of teeth	Weight (kg)
		DCX	DMM	DN	LH	LS	LF		
RSXF 08020 ES	●	20	20	16,9	30	70	100	3	0,3
08025 ES	●	25	25	21,9	40	80	120	4	0,4
RSXF 10025 ES	●	25	25	20,3	50	80	130	3	0,4
10032 ES	●	32	32	27,1	50	80	130	4	0,7
RSXF 12032 ES	●	32	32	25,6	50	80	130	3	0,7

Inserts

Application	Grade				
High Speed/Light Cut			M S	M S	
General Purpose	P M		M S	M S	M S
Roughing	P M	K			M S

Cat. No.	ACP200	ACK300	ACM100	ACM200	ACM300	Dimens. IC	Dimens. S	Applicable Cutters
RDET 0803M0EN G	●	●	●	●	●	8	3,18	RSX(F) 08000ES
0803M0EN H	❍	●	●	●	●	8	3,18	
RDET 10T3M0EN G	●	●	●	●	●	10	3,97	RSX(F) 10000ES
10T3M0EN H	●	●	●	●	●	10	3,97	
RDET 1204M0EN G	●	●	●	●	●	12	4,76	RSX(F) 12000ES
1204M0EN H	●	●	●	●	●	12	4,76	



Cutting Edge Cross Section

G - Type **H** - Type

M0: IC is metric

Spare Parts

Applicable Cutters	Wrench	Screw	N·m
RSX(F) 08000ES	TRDR08IP	BFTX02506IP	**1,5**
RSX(F) 10000ES	TRDR15IP	BFTX03584IP	**3,0**
RSX(F) 12000ES		BFTX0409IP	**3,0**

Identification Details

RSX	F	10	025	ES
Cutter Series	Fine Pitch Type	Insert Size	Cutter Diameter	Endmill Type

Recommended Cutting Conditions

Min.-**Optimum**-Max.

ISO	Work Material			Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_t (mm/t)	Grade
P	Carbon Steel			180–280	100–**160**–200	0,20–**0,40**–0,60	ACP200
P	Alloy Steel			180–280	100–**140**–180	0,20–**0,30**–0,40	ACP200
M	Stain-less Steel	Cr Based	Ferritic	200	150–**180**–200	0,15–**0,25**–0,35	ACM300
M	Stain-less Steel	Cr Based	Martensitic	200–330	80–**120**–180	0,15–**0,25**–0,35	ACM300
M	Stain-less Steel	Cr-Ni Based	Austenitic	200	150–**180**–200	0,15–**0,25**–0,35	ACM300
M	Stain-less Steel	Cr-Ni Based	Austenitic, ferritic	230–270	80–**120**–180	0,15–**0,25**–0,35	ACM200
M	Stain-less Steel	Cr-Ni Based	Precipitation hardening	330	60–**100**–160	0,15–**0,25**–0,35	ACM200
K	Cast Iron			250	80–**120**–160	0,10–**0,30**–0,40	ACK300
S	Heat resistant alloy		Ni based material	250–350	20–**30**– 40	0,10–**0,20**–0,30	ACM100 ACM200
S	Titanium		Pure Titanium	(Rm400)	60–**80**–100	0,10–**0,20**–0,30	ACM100 ACM200
S	Titanium		$\alpha + \beta$ alloy system	(Rm1050)	40–**50**–60	0,10–**0,20**–0,30	ACM100 ACM200

● = Euro stock
❍ = Japan stock

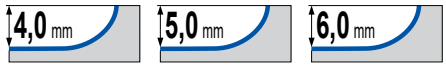
→ G20/G21

N·m Recommended Tightening Torque (N·m)

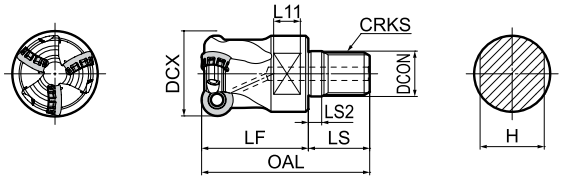
RSX(F)08000/10000/12000 M

Modular Type

Rake Angle		
	Radial	-5°– -8°
	Axial	10°



(08000ES) (10000ES) (12000ES)



Body (RSX...M, Standard)

Cat. No.	Stock	Dimensions (mm) DCX	DCON	CRKS	OAL	LF	LS2	LS	L11	H	No. of Teeth	Weight (kg)
RSX 08020M10Z2	●	20	10,5	M10	49	30	5	19	8	15	2	0,1
08025M12Z3	❍	25	12,5	M12	56	35	5	21	10	19	3	0,1
08032M16Z4	❍	32	17,0	M16	63	40	5	23	10	24	4	0,2
RSX 10025M12Z2	❍	25	12,5	M12	56	35	5	21	10	19	2	0,1
10032M16Z3	●	32	17,0	M16	63	40	5	23	10	24	3	0,2
RSX 12032M16Z2	❍	32	17,0	M16	63	40	5	23	10	24	2	0,2
12040M16Z3	●	40	17,0	M16	63	40	5	23	10	24	3	0,3

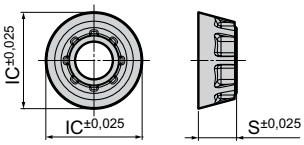
Body (RSXF...M, Fine Pitch)

Cat. No.	Stock	Dimensions (mm) DCX	DCON	CRKS	OAL	LF	LS2	LS	L11	H	No. of Teeth	Weight (kg)
RSXF 08020M10Z3	❍	20	10,5	M10	49	30	5	19	8	15	3	0,1
08025M12Z4	●	25	12,5	M12	56	35	5	21	10	19	4	0,1
08032M16Z5	●	32	17,0	M16	63	40	5	23	10	24	5	0,2
RSXF 10025M12Z3	●	25	12,5	M12	56	35	5	21	10	19	3	0,1
10032M16Z4	●	32	17,0	M16	63	40	5	23	10	24	4	0,2
RSXF 12032M16Z3	●	32	17,0	M16	63	40	5	23	10	24	3	0,2
12040M16Z4	●	40	17,0	M16	63	40	5	23	10	24	4	0,3

Inserts

Application	Grade				
High Speed/Light Cut			M S	M S	
General Purpose	P M		M S	M S	M S
Roughing	P M	K			M S

Cat. No.	ACP200	ACK300	ACM100	ACM200	ACM300	Dimens. IC	S	Applicable Cutters
RDET 0803M0EN G	●	●	●	●	●	8	3,18	RSX(F) 08000ES
0803M0EN H	❍	●	●	●	●	8	3,18	
RDET 10T3M0EN G	●	●	●	●	●	10	3,97	RSX(F) 10000ES
10T3M0EN H	●	●	●	●	●	10	3,97	
RDET 1204M0EN G	●	●	●	●	●	12	4,76	RSX(F) 12000ES
1204M0EN H	●	●	●	●	●	12	4,76	



Cutting Edge Cross Section

G - Type **H** - Type

M0: IC is metric

Spare Parts

Applicable Cutters	Wrench	Screw	N·m
RSX(F) 08000M	TRDR08IP	BFTX02506IP	**1,5**
RSX(F) 10000M	TRDR15IP	BFTX03584IP	**3,0**
RSX(F) 12000M		BFTX0409IP	**3,0**

Identification Details

RSX	F	10	025	M12	Z3
Cutter Series	Fine Pitch Type	Insert Size	Cutter Diameter	Mounting Screw Size	No. of Teeth

Recommended Cutting Conditions

Min.-**Optimum**-Max.

ISO	Work Material			Hardness (HB)	Cutting Speed v_c (m/min)	Feed Rate f_t (mm/t)	Grade
P	Carbon Steel			180–280	100–**160**–200	0,20–**0,40**–0,60	ACP200
P	Alloy Steel			180–280	100–**140**–180	0,20–**0,30**–0,40	ACP200
M	Stainless Steel	Cr Based	Ferritic	200	150–**180**–200	0,15–**0,25**–0,35	ACM300
M	Stainless Steel	Cr Based	Martensitic	200–330	80–**120**–180	0,15–**0,25**–0,35	ACM300
M	Stainless Steel	Cr-Ni Based	Austenitic	200	150–**180**–200	0,15–**0,25**–0,35	ACM300
M	Stainless Steel	Cr-Ni Based	Austenitic, ferritic	230–270	80–**120**–180	0,15–**0,25**–0,35	ACM200
M	Stainless Steel	Cr-Ni Based	Precipitation hardening	330	60–**100**–160	0,15–**0,25**–0,35	ACM200
K	Cast Iron			250	80–**120**–160	0,10–**0,30**–0,40	ACK300
S	Heat resistant alloy		Ni based material	250–350	20–**30**–40	0,10–**0,20**–0,30	ACM100 ACM200
S	Titanium		Pure Titanium	(Rm 400)	60–**80**–100	0,10–**0,20**–0,30	ACM100 ACM200
S	Titanium		$\alpha + \beta$ alloy system	(Rm 1050)	40–**50**–60	0,10–**0,20**–0,30	ACM100 ACM200

WFXC Type

Expansion

General Features

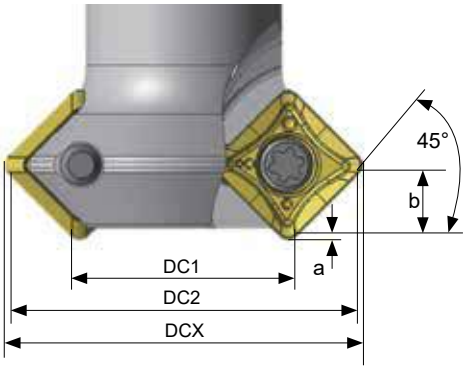
The WaveMill WFXC type is a chamfering tool that uses inserts for the WFX series. This allows the WFXC type to support many types of work materials using a variety of grades.

Application Notes

Since chamfering uses the straight cutting edge portion of the insert, the range that can be chamfered will change depending on the corner radius (RE) of the insert that is attached to the body.
Work diameter: Use in a range grater or equal to DC1 and less than or equal to DC2.
Depth: The workpiece can be chamfered from „a“, which is the distance from the tip of the tool to the straight cutting edge at the depth indicated by „b“.

Body	Insert		Min. Work Diameter	Max. Work Diameter	Min. Depth	Max. Depth	Max. Diameter
	Cat. No.	RE	DC1	DC2	a	b	DCX
WFXC 08008E	SOMT 080304	0,4	7,5	15,8	0,1	4,1	17,8
	SOMT 080308	0,8	8,0	15,8	0,2	3,9	17,5
	SOMT 080312	1,2	8,5	15,8	0,4	3,6	17,2
WFXC 08016E	SOMT 080304	0,4	15,5	23,8	0,1	4,1	25,8
	SOMT 080308	0,8	16,0	23,8	0,2	3,9	25,5
	SOMT 080312	1,2	16,5	23,8	0,3	3,6	25,2
WFXC 12025E	SOMT 120404	0,4	24,6	38,3	0,1	6,8	41,3
	SOMT 120408	0,8	25,0	38,3	0,2	6,6	41,0
	SOMT 120412	1,2	25,6	38,3	0,4	6,3	40,7
	SOMT 120416	1,6	26,1	38,3	0,5	6,1	40,4
WFXC 12032E	SOMT 120404	0,4	31,6	45,3	0,1	6,8	48,3
	SOMT 120408	0,8	32,0	45,3	0,2	6,6	48,0
	SOMT 120412	1,2	32,6	45,3	0,4	6,3	47,7
	SOMT 120416	1,6	33,1	45,3	0,5	6,1	47,4

Dimensions (mm)



→ G26/G27

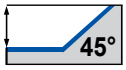
● = Euro stock
❍ = Japan stock

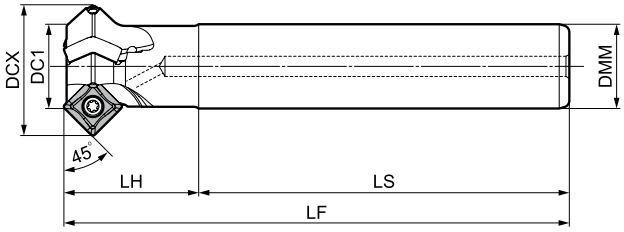
Recommended Tightening Torque (N·m)

WFXC 08000/12000 E

Expansion

Rake Angle	Radial	0°
	Axial	0°





Body WFXC 08000E (Standard Type)

Cat. No.	Stock	Dimensions (mm)						No. of Teeth	Weight (kg)
		DC1	DCX	LF	LH	LS	DMM		
WFXC 08008E	❍	8	17,5	120	30	90	10	1	0,1
08016E	❍	16	25,5	120	30	90	16	2	0,2

Body WFXC 12000E (Standard Type)

Cat. No.	Stock	Dimensions (mm)						No. of Teeth	Weight (kg)
		DC1	DCX	LF	LH	LS	DMM		
WFXC 12025E	❍	25	41,0	150	40	110	25	3	0,6
12032E	❍	32	48,0	150	40	110	32	3	1,0

Identification Details

WFX	C	08	016	E
Cutter Series	Chamfering	Insert Size	Cutter Diameter	Endmill Type

Inserts

Dimensions (mm)

Application	Coated Carbide										Carbide	DLC			
High Speed / Light cut	K P N		P			K	K		M S		K N				
General Purpose	K P N	K P M		P M	P M	K	K		M S	M S		N			
Roughing	K P N	K P M		P M	P M			K		M S		N			
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	RE	Fig.	Applicable Cutters
SOMT 080304 PZER L	●	❍	●	●	❍	❍	❍	●	●	●	–	–	0,4	1	WFXC08000E
080308 PZER L	●	❍	❍	●	●	❍	●	●	●	●	–	–	0,8	1	
SOMT 080304 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,4	1	
080308 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	1	
080312 PZER G	●		●	●	●		❍	●	●	●	–	–	1,2	1	
SOMT 080308 PZER H	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	1	
080312 PZER H	●		●	●	●		❍	●	❍	●	–	–	1,2	1	
SOET 080304 PZER G	●		❍	❍	❍		❍	●	●	❍	–	–	0,4	1	
080308 PZER G	●		❍	❍	❍		❍	●	●	❍	–	–	0,8	1	
080312 PZER G	●		❍	●	❍		❍	●	❍	❍	–	–	1,2	1	
SOET 080302 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,2	1	
080304 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,4	1	
080308 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,8	1	
SOMT 120408 PDER L	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	2	WFXC12000E
SOMT 120404 PDER G	●	❍	❍	●	●	❍	●	●	●	●	–	–	0,4	2	
120408 PDER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	2	
120412 PDER G	●		❍	●	❍		●	❍	❍	●	–	–	1,2	2	
120416 PDER G	●		●	●	●		❍	❍	❍	❍	–	–	1,6	2	
SOMT 120408 PDER H	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	2	
SOET 120408 PDFR S			–	–	–		–	–	–	–	●	●	0,8	2	

Fig. 1

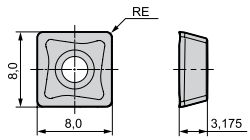
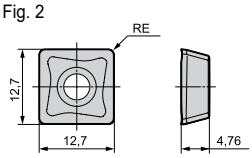


Fig. 2



Spare Parts

Applicable Cutter	Screw		Wrench
		N·m	
WFXC08000E	BFTX0306IP	2,0	TRDR08IP
WFXC12000E	BFTX03512IP	3,0	TRDR15IP

Recommended Cutting Conditions

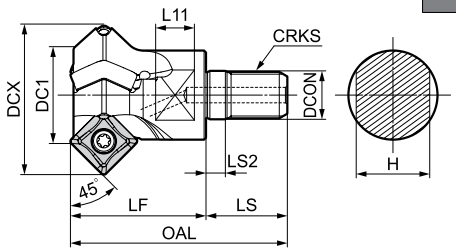
ISO	Work Material	Hardness (HB)	Cutting Speed	Feed Rate
P	General Steel	180–280	150–**200**–250	0,05–**0,10**–0,15
	Soft Steel	≤180	180–**265**–350	0,10–**0,15**–0,20
	Die Steel	200–220	100–**150**–200	0,05–**0,10**–0,15
M	Stainless Steel	-	150–**200**–250	0,05–**0,10**–0,15
K	Cast Iron	250	100–**175**–250	0,05–**0,10**–0,15

Min. - **Optimum** - Max.

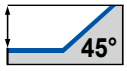
WFXC 08000/12000 M

Expansion

Modular Type



Rake Angle	Radial	0°
	Axial	0°



Head (WFXC 08000M)

Cat. No.	Stock	Dimensions (mm)										No. of Teeth	Weight (kg)
		DC1	DCX	DCON	CRKS	OAL	LF	LS2	LS	L11	H		
WFXC 08016M08Z2	❍	16	25,5	8,5	M8	42	25	5	17	8	13	2	0,1

Identification Details

WFX	C	08	016	M08	Z2
Cutter Series	Chamfe-ring	Insert Size	Cutter Diameter	Screw Size	No. of Teeth

Head (WFXC 12000M)

Cat. No.	Stock	Dimensions (mm)										No. of Teeth	Weight (kg)
		DC1	DCX	DCON	CRKS	OAL	LF	LS2	LS	L11	H		
WFXC 12025M12Z3	❍	25	41,0	12,5	M12	56	32	5	21	10	19	3	0,1
12032M16Z3	❍	32	48,0	17,0	M16	63	40	5	23	10	24	3	0,2

Inserts

Dimensions (mm)

Application	Coated Carbide										Carbide	DLC			
High Speed / Light cut	K P M N		P			K	K		M S		K N				
General Purpose	K P M N	K P M		P M	P M	K	K		M S	M S		N			
Roughing	K P M N	K P M		P M	P M			K		M S		N			
Cat. No.	ACU2500	XCU2500	ACP100	ACP200	ACP300	XCK2000	ACK200	ACK300	ACM200	ACM300	H1	DL1000	RE	Fig.	Applicable Cutters
SOMT 080304 PZER L	●	❍	●	●	❍	❍	❍	●	●	●	–	–	0,4	1	WFXC08000E
080308 PZER L	●	❍	❍	●	●	❍	●	●	●	●	–	–	0,8	1	
SOMT 080304 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,4	1	
080308 PZER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	1	
080312 PZER G	●		●	●	●		❍	●	●	●	–	–	1,2	1	
SOMT 080308 PZER H	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	1	
080312 PZER H	●		●	●	●		❍	●	❍	●	–	–	1,2	1	
SOET 080304 PZER G	●		❍	❍	❍		❍	●	●	❍	–	–	0,4	1	
080308 PZER G	●		❍	❍	❍		❍	●	●	❍	–	–	0,8	1	
080312 PZER G	●		❍	●	❍		❍	●	❍	❍	–	–	1,2	1	
SOET 080302 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,2	1	
080304 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,4	1	
080308 PZFR S	–	–	–	–	–	–	–	–	–	–	●	●	0,8	1	
SOMT 120408 PDER L	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	2	WFXC12000E
SOMT 120404 PDER G	●	❍	❍	●	●	❍	●	●	●	●	–	–	0,4	2	
120408 PDER G	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	2	
120412 PDER G	●		❍	●	❍		●	❍	❍	●	–	–	1,2	2	
120416 PDER G	●		●	●	●		❍	❍	❍	❍	–	–	1,6	2	
SOMT 120408 PDER H	●	❍	●	●	●	❍	●	●	●	●	–	–	0,8	2	
SOET 120408 PDFR S			–	–	–		–	–	–	–	●	●	0,8	2	

Fig. 1

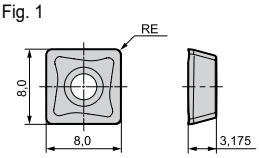
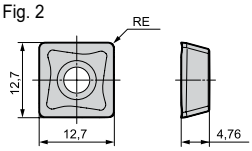


Fig. 2



Spare Parts

Applicable Cutter	Screw		Wrench
		N·m	
WFXC08000M	BFTX0306IP	2,0	TRDR08IP
WFXC12000M	BFTX03512IP	3,0	TRDR15IP

Recommended Cutting Conditions

ISO	Work Material	Hardness (HB)	Cutting Speed	Feed Rate
P	General Steel	180–280	150–**200**–250	0,05–**0,10**–0,15
	Soft Steel	≤180	180–**265**–350	0,10–**0,15**–0,20
	Die Steel	200–220	100–**150**–200	0,05–**0,10**–0,15
M	Stainless Steel	-	150–**200**–250	0,05–**0,10**–0,15
K	Cast Iron	250HB	100–**175**–250	0,05–**0,10**–0,15

Min. - **Optimum** - Max.

● = Euro stock
❍ = Japan stock

N·m Recommended Tightening Torque (N·m)

Expansion

Features

- **Drastically Reduced Runout Adjustment Time**
  Simple screw-fastening structure enables fine adjustments to be made easily.
- **Blade Through Coolant**
  Secures a supply of coolant to the cutting edge and breaks chips thoroughly.
- **Lightweight Aluminum Alloy Body**
  Utilizing aluminum alloy to achieve a total weight of less than 1,3 kg for a Ø 125 mm cutter with 22 teeth.

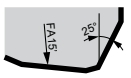
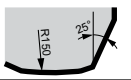
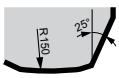
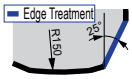
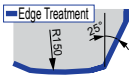
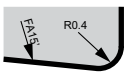
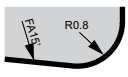
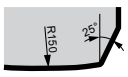
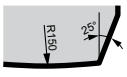
Product Range

Type	Cat. No.	Body Material	Diameter Range (mm) / No of Teeth									
			Ø 25	Ø 30	Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100	Ø 125	Ø 160
Shell	ANXA 16000RS	Aluminum Alloy	→ G78						6, 10, 14	8, 12, 18	10, 14, 22	12, 20, 28
	ANXA 16000R (Inch)	Aluminum Alloy							6, 10, 14	8, 12, 18	10, 14, 22	12, 20, 28
	ANXS 16000RS	Steel	→ G80			4, 6	4, 6, 9	6, 8, 12	6, 10, 14	8, 12, 18	10, 14, 22	
	ANXS 16000R (Inch)	Steel						6, 8, 12	6, 10, 14	8, 12, 18	10, 14, 22	
Shank	ANXS 16000E	Steel	2	3, 4	3, 4	4, 6	4, 6, 9					
Modu-lar	ANXS 16000M	Steel	2	3, 4	3, 4	4, 6						

→ M58-M69

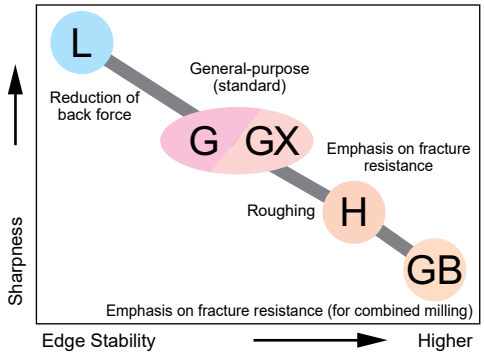
Inch Inch Bore

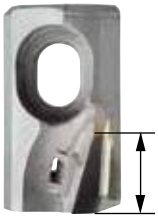
Blade Selection Guide

Work Material	N								
Applications	Finishing / Light Cutting	General Purpose	Roughing		Combined Milling *1	Corner Radius Milling	Corner Radius Milling	Finishing	Burr-free / Mirror Finishing
Features	Low Cutting Force	Standard	Long Edge	High Strength	High Strength	Corner Radius 0,4	Corner Radius 0,8	Wiper	Wiper
Type	L	G	GX	H	GB	-	-	W	WS
Cutting Edge Shape									
Edge Length(*2)	6,0 mm	6,0 mm	9,0 mm	6,0 mm	6,0 mm	6,0 mm	6,0 mm	2,0 mm	—

*1 Machining of components combining aluminum alloy and cast iron

Edge Selection Guide

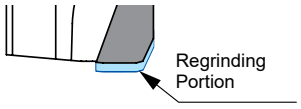


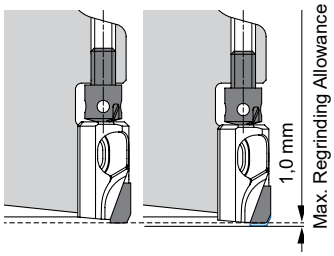


*2 Edge length
GX type = 9,0 mm

- **Reduces Running Costs by Drastically Increasing Blade, Insert Regrinding Allowance (to 1,0 mm)**

Assuming 0,2 mm of regrinding each time, an edge can be used up to 6 times.
(Peripheral edge cannot be reground.)





If you wish to use reground blades you shall use sets of blades with matching size of the same level in order to keep the balance.

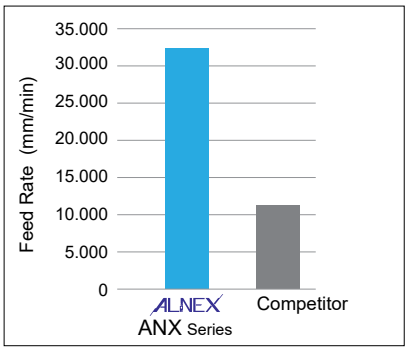
Performances

High-Speed / High-Efficiency Cutting

Realizes ultra-high efficiency machining with v_f = 30.000 mm/min

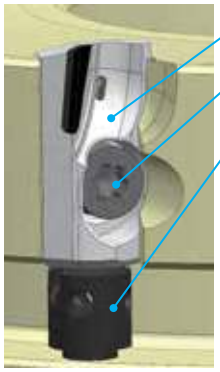
Comparison: Cutter Diameter Ø 100 mm

	Spindle Speed min^{-1}	Number of Teeth	Feed Rate v_f (mm/min)
ANX Series	18.000	18	32.400
Competitor	9.500	12	11.400

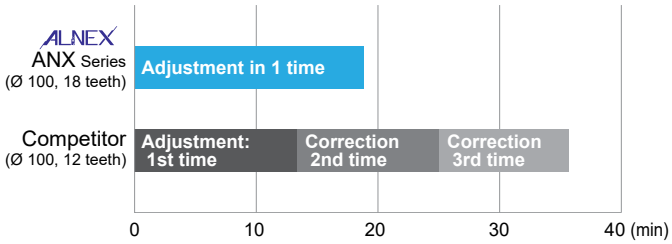


Drastically Reduces Runout Adjustment Time

- Simple screw-fastening structure
- Enables fine adjustments to be made easily
- High-rigidity body

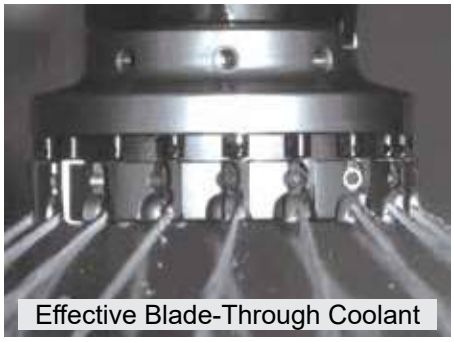


Adjustment Time for Runout Setting ≤ 5 µm



Already completed in 1st time setting, adjustment time reduced.

Chip Control



Blade-Through Coolant Chip Breaking

ALNEX ANX Series

Competitor

Work Material: G-AlSi12Cu
Cutting Conditions: v_c = 2500 m/min, f_z = 0,05 mm/t, a_p = 0,5 mm, wet

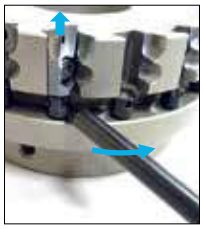
Adjustment of the Blades, Runout Alignment

①

Insert the blade into its seat.

②

While holding the blade against the seat, install the clamping bolt using the provided wrench, pre-tightening the bolt. (recommended pre-torque is 1 N·m)

③ 

Using the provided wrench for the height adjustment screw, set the height to your predetermined value.

④

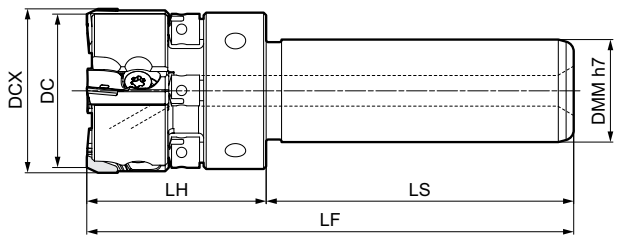
Fully tighten the clamp bolt. (recommended torque is 2 N·m)

ANXS 16000 E

Expansion

Rake Angle	Radial	-2 – 0°
	Axial	+5°

3 mm 90°



Body - ANXS (Steel)

Dimensions (mm)

Cat. No.	Stock	DC	DCX	DMM	LH	LS	LF	No. of Teeth	Weight (kg)
ANXS 16025E02	●	23	25	20	35	60	95	2	0,2
16030E03	●	28	30	20	35	60	95	3	0,3
16030E04	●	28	30	20	35	60	95	4	0,3
16032E03	●	30	32	20	35	60	95	3	0,3
16032E04	●	30	32	20	35	60	95	4	0,3
16040E04	●	38	40	20	40	60	100	4	0,4
16040E06	●	38	40	20	40	60	100	6	0,5
16050E04	❍	48	50	32	40	80	120	4	1,0
16050E06	●	48	50	32	40	80	120	6	1,0
16050E09	●	48	50	32	40	80	120	9	1,0

Blades are sold separately. If using a blade for corner radius machining (ANB1604R/ANB1608R), DC = DCX.
The weight includes the weight of the blade and parts.

Identification Details

ANX	S	16	032	E	04
Cutter Series	Steel Body	Blade Size	Cutter Diameter	Round Shank	Number of Teeth

● = Euro stock
❍ = Japan stock

❑ = Delivery on request

Recommended Tightening Torque (N·m)

Expansion

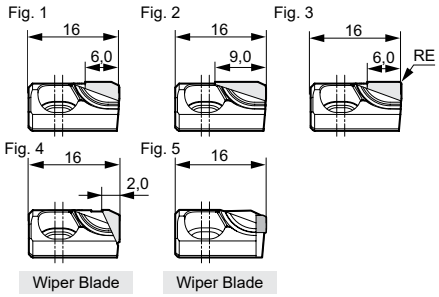
Blades

Dimensions (mm)

Application	SUMIDIA		CVD
High Speed / Light Cut	N	K N	N
General Purpose	N	K N	
Roughing	N	K N	

→ M60-M61

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	RE	Wiper Edge Shape	Applications	Fig.
ANB 1600R-L	●		–	6,0	–	Linear	Low Cutting Force	1
1600R-G	●		–	6,0	–	Arc-Shaped	General Purpose	1
1600R-GB		●	–	6,0	–	Arc-Shaped	Combined Milling*	1
1600R-H	●	–	–	6,0	–	Arc-Shaped	Strong Edge	1
1600R-GX	❍		–	9,0	–	Arc-Shaped	Long Edge	2
1604R	❍		–	6,0	0,4	Linear	Corner Radius	3
1608R	❍		–	6,0	0,8	Linear	Corner Radius	3
1600R-W	❍		–	2,0	–	Arc-Shaped	Wiper	4
1600R-WS	–	–	❑	–	–	Arc-Shaped	Wiper	5



* Cast Iron/Aluminum Alloy

Recommended Cutting Conditions

Si content ≤ 12,6 %

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
N	Aluminum Alloy	–	2.000–**2.500**–3.000	0,05–**0,13**–0,20	DA1000

Si content > 12,6 %

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
N	Aluminum Alloy	–	400–**600**–800	0,05–**0,13**–0,20	DA1000 DA90

Combined Milling of Cast Iron/Aluminum Alloy

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
K N	Cast Iron/ Aluminum Alloy	–	300–**400**–500	0,05–**0,13**–0,20	DA90

The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine rigidity, work clamp rigidity, depth of cut and other factors.

Max. Allowable Spindle Speed

Cat. No.	n max (min^{-1})
ANXS 16025E02	10.000
16030E03	10.000
16030E04	10.000
16032E03	10.000
16032E04	10.000
16040E04	10.000
16040E06	10.000
16050E04	10.000
16050E06	10.000
16050E09	10.000

Spare Parts

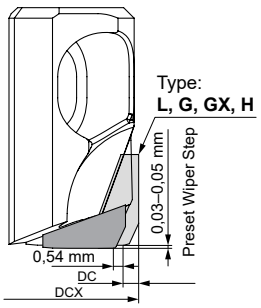
Sold separately.

Applicable Cutters	Clamp Screw		Adjustment Screw	Wrench	Adjustment Wrench	Assembly Wrench
ANXS 160_ _E_ _	BXA0310IP	2,0	HFJ	TRXW10IP	ANT	HFVT

The adjustment spanner (ANT) can also be used for height adjustment of the RF type cutters for high speed machining and the HF type cutters for high efficiency machining.

Wiper Blade Step Amount

When using the wiper blade, in order to maintain balance, be sure to use a cutter with an even number of cutting edges and place the wiper blades at opposite positions.



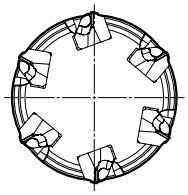
Alnex
ANXS 16000 M

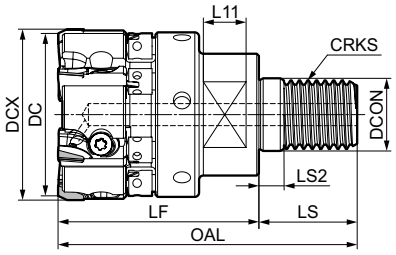
New

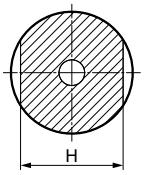
Modular Type

Rake Angle	Radial	-2 – 0°
	Axial	+5°

3 mm 90°







Body - ANXS (Steel)

Dimensions (mm)

Cat. No.	Stock	DC	DCX	DCON	CRKS	OAL	LF	LS2	LS	L11	H	No. of Teeth	Weight (kg)
ANXS 16025M12Z02	❍	23	25	12,5	**M12**	61	40	5	21	10	19	2	0,1
16030M16Z03	❍	28	30	17,0	**M16**	70	47	5	23	10	24	3	0,2
16030M16Z04	❍	28	30	17,0	**M16**	70	47	5	23	10	24	4	0,2
16032M16Z03	❍	30	32	17,0	**M16**	70	47	5	23	10	24	3	0,3
16032M16Z04	❍	30	32	17,0	**M16**	70	47	5	23	10	24	4	0,3
16040M16Z04	❍	38	40	17,0	**M16**	70	47	5	23	10	24	4	0,4
16040M16Z06	❍	38	40	17,0	**M16**	70	47	5	23	10	24	6	0,4

Blades are sold separately. If using a blade for corner radius machining (ANB1604R/ANB1608R), DC = DCX.
The weight includes the weight of the blade and parts.

Identification Details

ANX	S	16	032	M16	Z03
Cutter Series	Steel Body	Blade Size	Cutter Diameter	Screw size	Number of Blades

● = Euro stock
❍ = Japan stock

❑ = Delivery on request

Recommended Tightening Torque (N·m)

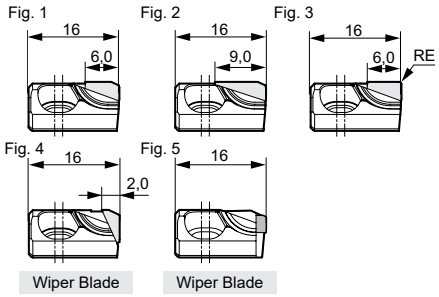
Blades

Dimensions (mm)

Application	SUMIDIA		CVD
High Speed / Light Cut	N	K N	N
General Purpose	N	K N	
Roughing	N	K N	

→ M60-M61

Cat. No.	DA1000	DA90	SCV10	Cutting Edge Length	RE	Wiper Edge Shape	Applications	Fig.
ANB 1600R-L	●		–	6,0	–	Linear	Low Cutting Force	1
1600R-G	●		–	6,0	–	Arc-Shaped	General Purpose	1
1600R-GB		●	–	6,0	–	Arc-Shaped	Combined Milling*	1
1600R-H	●	–	–	6,0	–	Arc-Shaped	Strong Edge	1
1600R-GX	❍		–	9,0	–	Arc-Shaped	Long Edge	2
1604R	❍		–	6,0	0,4	Linear	Corner Radius	3
1608R	❍		–	6,0	0,8	Linear	Corner Radius	3
1600R-W	❍		–	2,0	–	Arc-Shaped	Wiper	4
1600R-WS	–	–	❑	–	–	Arc-Shaped	Wiper	5



* Cast Iron/Aluminum Alloy

Recommended Cutting Conditions

Si content ≤ 12,6 %

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
N	Aluminum Alloy	–	2.000–**2.500**–3.000	0,05–**0,13**–0,20	DA1000

Si content > 12,6 %

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
N	Aluminum Alloy	–	400–**600**–800	0,05–**0,13**–0,20	DA1000 DA90

Combined Milling of Cast Iron/Aluminum Alloy

Min. - **Optimum** - Max.

ISO	Work Material	Hard-ness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
K N	Cast Iron/ Aluminum Alloy	–	300–**400**–500	0,05–**0,13**–0,20	DA90

The above recommended cutting conditions are meant as a guide. Actual conditions will depend on the individual machine rigidity, work clamp rigidity, depth of cut and other factors.

Max. Allowable Spindle Speed

Cat. No.	n max (min^{-1})
ANXS 16025M12Z02	10.000
16030M16Z03	10.000
16030M16Z04	10.000
16032M16Z03	10.000
16032M16Z04	10.000
16040M16Z04	10.000
16040M16Z06	10.000

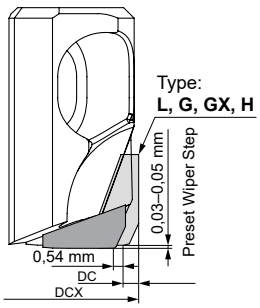
Spare Parts

Sold separately.

Applicable Cutters	Clamp Screw		Adjustment Screw	Wrench	Adjustment Wrench	Assembly Wrench
ANXS160_ _M_Z_ _	BXA0310IP	2,0	HFJ	TRXW10IP	ANT	HFVT

The adjustment spanner (ANT) can also be used for height adjustment of the RF type cutters for high speed machining and the HF type cutters for high efficiency machining.

Wiper Blade Step Amount



When using the wiper blade, in order to maintain balance, be sure to use a cutter with an even number of cutting edges and place the wiper blades at opposite positions.

J

Coated & Solid Endmills

J1–J44

	Selection Guide	According to Work Materials	J 2–3
Coated Endmills	GSX MILL Series	New **GSX** Global Standard Endmills	J 4–6
	GSX MILL Series	**GSX** 20000	J 7–11
		GSX 30000	J12–13
	Slotted Type	**GSXSLT** 30000	J14
		GSX 40000	J15–19
	Anti-Vibration Type	**GSXVL** 40000	J20–21
	For High-Performance Milling	**EPMS** 4000/5000/6000 New	J22–23
	SSEH MILL Series for Exotic Alloys	**SSEHVL** 4000W-R / **SSEH** 4000W-R	J24-26
	GS MILL Series, Roughing Type	**GSRE** 4000SF	J27
	Hard Type	**GSH** 4000/6000/8000SF	J28
	AURORA COAT MILL Series	**ASM** 2000/4000DL / DL-R	J29–30
	SSUP MILL Series	**SSUP** 4000ZX/ZX-R	J32–33
	Hard Type	**LHHM** 4000/6000/8000ZX	J31
		EHHM 4000/6000/8000ZX	J31
	GSX Mills Ball Type	**GSXB** 20000	J34
	AURORA COAT Ball Type	**SNB** 2000DL	J35
Uncoated Endmills			
	For Aluminium Cutting	**ASM** 2000	J36
	SSEH MILL Series for Exotic Alloys	**SSEHVL** 4000-R / **SSEH** 4000-R	J37
	Standard Type	**SSM** 2000/4000	J38–39
	SUMIBORON "Helical Master" for Hardened Steel	**BNES** 1000	J40
	SUMIBORON "Mould Finish Master" for Hardened Steel	**BNBP** 2R…4/6	J41
	SUMIDIA "Mould Finish Master" Binderless	**NPDRS / NPDB(S)**	J42–43

Selection Guide

● According to Work Materials

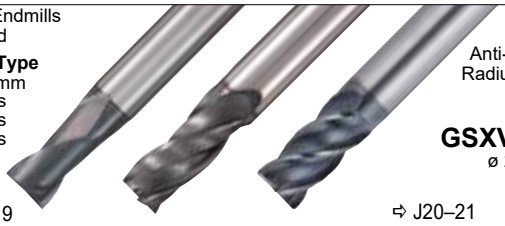
Square Type

Legend: Grade | Edge Type | Usage

General Steel (Common Use)

Coated | Sharp | General

Global Endmills
Standard
GSX Type
ø 1–25 mm
•2 Flutes
•3 Flutes
•4 Flutes



Anti-Vibration
Radius Corner
Endmills
GSXVL Type
ø 2–25 mm
•4 Flutes

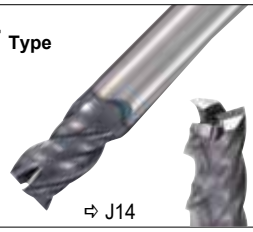
➪ J7–19
➪ J20–21

General Steel (Special Use)

Plunge Cut
Multi-Purpose

Coated | Sharp | General

GSX MILL
GSXSLT Type
ø 1–16 mm
•3 Flutes



➪ J14

High Efficiency

Coated | Strong | High Efficiency

UPMILL
SSUP-ZX Type
ø 2–20 mm
•4 Flutes

➪ J32–33

High Efficiency

Coated | Strong | High Efficiency

ROUGHING ENDMILL
GSRE-SFType
ø 6–20 mm
•4 Flutes

➪ J27

Hardened Steel

High performance Type

Coated | Strong | High Efficiency

GS-MILL-HARD
GSH-SF Type
ø 1–20 mm
•4 Flutes
•6 Flutes
•8 Flutes

➪ J28

High Rigidity Type

Coated | Strong | High Efficiency

HARD ENDMILL
LHHM...ZX
EHHM...ZX
ø 3–32 mm
•4 Flutes
•6 Flutes
•8 Flutes

➪ J31

SumiBoron Endmill

CBN

"Helical Master"
BNES Type
ø 6–16 mm
•1 Flute

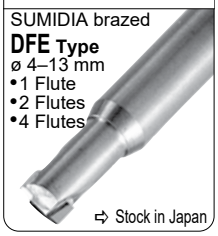
➪ J40, M74

Non-ferrous Metal

SumiDia Endmill

PCD

SUMIDIA brazed
DFE Type
ø 4–13 mm
•1 Flute
•2 Flutes
•4 Flutes



➪ Stock in Japan

DLC-Coated Endmill

Coated | Sharp | General

AURORA COATED
ASM-DL Type
ø 2–16 mm
•2 Flutes
•4 Flutes

➪ J29–30

Exotic Metals

For Heat Resistant Steel

Coated | Sharp | High Efficiency

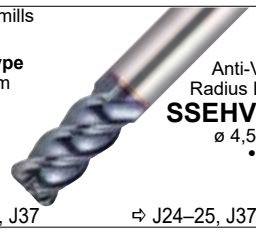
Radius Endmills
Anti-Vibration
EPMS Type New
ø10–26 mm
•6 Flutes

➪ J22-23

For Heat Resistant Steel

Coated | Sharp | General

Radius Endmills
Standard
SSEH Type
ø 4,5–25 mm
•4 Flutes



Anti-Vibration
Radius Endmills
SSEHVL Type
ø 4,5–25 mm
•4 Flutes

➪ J24, J26, J37
➪ J24–25, J37

● According to Work Materials

Ballnose Type

General Steel (Common Use)

Coated | General

GSX MILL BALL
GSXB Type
R 0,2–12,5 mm
•2 Flutes

➪ J34

General Steel (Short Series)

Coated | Short | General

NEOBALL SHORT FLUTE
S-SNB-ZX Type
R 1,5–15 mm
•2 Flutes

➪ Stock in Japan

Coated | Short | General

ZX-COATED SHORT FLUTE
S-SSB-ZX Type
R 1,5–4 mm
•2 Flutes

➪ Stock in Japan

Hardened Steel

High Rigidity Type

Coated | Strong | High Efficiency

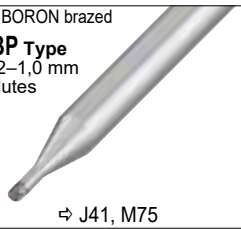
HARDBALL
SHB-ZX Type
R 0,5–10 mm
•2 Flutes

➪ Stock in Japan

Hardened Steel

CBN | MOULD FINISH MASTER | PCD

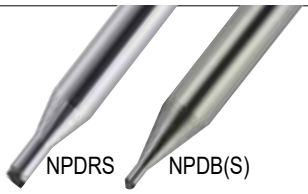
SUMIBORON brazed
BNBP Type
R 0,2–1,0 mm
•2 Flutes



➪ J41, M75

SUMIDIA binderless
NPDRS Type
R 0,2–2,0 mm
•1 Flute
Radius Endmill

NPDB(S) Type
R 0,1–1,0 mm
•1 Flute
Ballnose Endmill



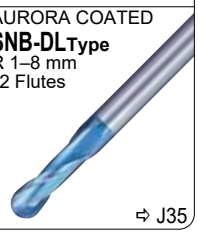
➪ J42–43, M76–76

Non-ferrous Metal

DLC-Coated Endmill

Coated | General

AURORA COATED
SNB-DL Type
R 1–8 mm
•2 Flutes



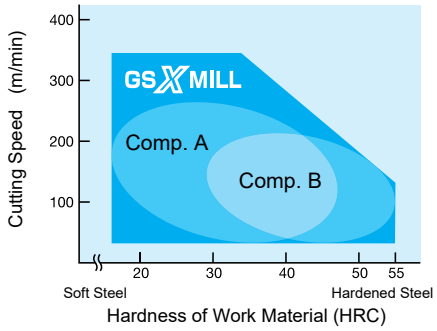
➪ J35

GSX MILL Series

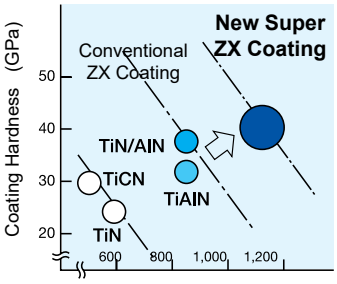
■ Characteristics and Applications

- ⊠ Wide variation of three flute types and four flute lengths enable use in a wide variety of applications.
- ● Fine carbide substrate provides high transverse rupture strength and excellent thermal shock resistance improving reliability in wet cutting applications.
- ● GSX Coating provides improved reliability and longer tool life.
- ● Large rake angle and unique flute design improve sharpness and chip evacuation.
- ● Cutting teeth with gash land improves corner flute strength.
- ● Sharper edge S type and fracture resistant C type added to the 2D size series.

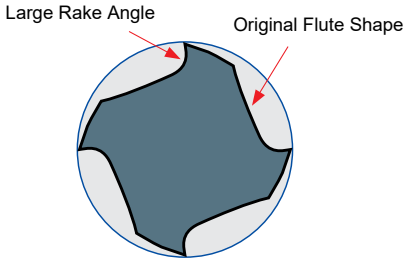
● Wear Resistance



● Thermal Resistance



● Improved Chip Evacuation

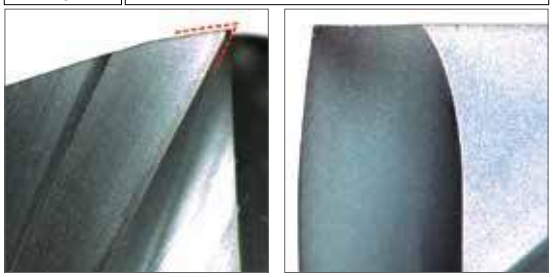


Large rake angle combined with our unique flute design improves sharpness and chip evacuation.

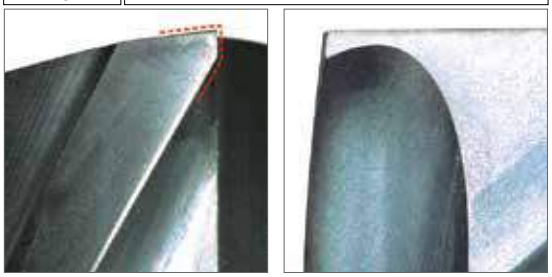
■ 2 cutting edge designs expand machining applications

Sharper edge S type and fracture resistant C type added to the 2D size series.

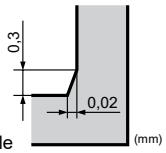
S Type | Sharp Corner: Sharper Edge Design



C Type | Gash Land: Fracture Resistant Design



Note: In gash land drilling, some material remains as shown on the right. If you need sharp corners, use the S Type.



Ex.: Corner on a ø 10 mm hole

■ Application Range

P					H			M	S		K	N		
					Hardened Steel									
General Structure Rolled Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	45 ~ 55 HRC	55 ~ 60 HRC	60 ~ 65 HRC	Stainless Steel	Ti Alloy	Heat Resistant Alloy	Cast Iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎ *1			◎	○	○	○			

◎ : Best
○ : Good

Blank : Not recommended
*1: GSXSLT30000C is recommended for 50 HRC or less

■ Recommended Milling Examples

Application	Surface Milling		Grooving		Groove Finishing	
Form						
	Rough	Finishing	Rough	Finishing	Rough	Finishing
S Type		◎		○		◎
C Type	◎	○	◎	◎	◎	○

S Type is best for removing inside corners.

*2: Use with small depth of cut.

GSX MILL Series

Large rake angle and unique flute design improve sharpness and excellent chip evacuation.

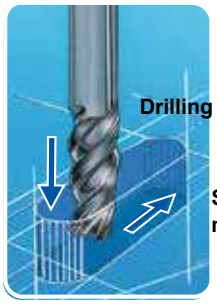
Product Range

Application	No. of Teeth	Flute Length				
		1,5 D	2 D		3 D	4 D
		C Type	S Type	C Type	C Type	C Type
General Purpose	2 Flutes	GSX20000C-1.5D ⇨ J 7	GSX20000S-2D ⇨ J 8	GSX20000C-2D ⇨ J 9	GSX20000C-3D ⇨ J 10	GSX20000C-4D ⇨ J 11
	3 Flutes	GSX30000C-1.5D ⇨ J 12		GSX30000C-2D ⇨ J 13		
	4 Flutes	GSX40000C-1.5D ⇨ J 15	GSX40000S-2D ⇨ J 16	GSX40000C-2D ⇨ J 17	GSX40000C-3D ⇨ J 18	GSX40000C-4D ⇨ J 19
Compound Endmilling	3 Flutes	GSXSLT30000C-1.5D ⇨ J 14				

Multi-Purpose "GSX-SLT" Slot Type

- Optimized flute design of slotted 3 flute (1.5D) short type reduces cutting resistance.

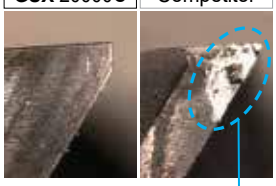
① Allows drilling and slot milling and other continuous (compound) applications.
② Perfect for use with thin sheets and small machining centres



Application Examples

● Carbon Steel Grooving with GSX20000C

GSX 20000C | Competitor

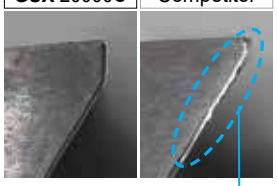


Gash land for stronger cutting edge.

Tool dimension	ø 6 (2 Flutes)
Work material	C50
Cutting speed	v_c = 87 m/min
	n = 4615 rpm
Feed rate	f_z = 0,06 mm/teeth
	v_f = 553 mm/min
Depth of cut	a_p = 3 mm
Wide of cut	a_e = 6 mm
Cooland	Dry
Vertical machining centre (BT50)	

● Cast Iron Grooving with GSX20000C

GSX 20000C | Competitor

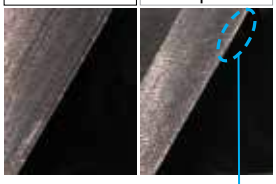


GSX coating for improved wear resistance.

Tool dimension	ø 10 (2 Flutes)
Work material	GGG60
Cutting speed	v_c = 66 m/min
	n = 2100 rpm
Feed rate	f_z = 0,072 mm/teeth
	v_f = 302 mm/min
Depth of cut	a_p = 5 mm, 5 passes
Wide of cut	a_e = 10 mm
Cooland	Dry
Vertical machining centre (BT40)	

● Stainless Steel Machining with GSX20000C

GSX 20000C | Competitor

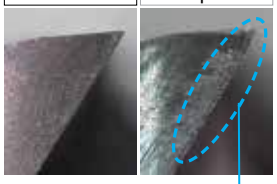


Improved reliability even under wet machining.

Tool dimension	ø 10 (2 Flutes)
Work material	X5 CrNi 1812
Cutting speed	v_c = 50 m/min
	n = 1591 rpm
Feed rate	f_z = 0,04 mm/teeth
	v_f = 27 mm/min
Depth of cut	a_p = 10 mm
Wide of cut	a_e = 0,5 mm
Cooland	Wet
Vertical machining centre (BT50)	

● Surface Milling C50 with GSX20000S

GSX 20000S | Competitor



S type delivers optimum cutting performance.

Tool dimension	ø 6 (2 Flutes)
Work material	C50
Cutting speed	v_c = 87 m/min
	n = 4615 rpm
Feed rate	f_z = 0,06 mm/teeth
	v_f = 553 mm/min
Depth of cut	a_p = 10 mm
Wide of cut	a_e = 0,3 mm
Cooland	Dry
Vertical machining centre (BT50)	

GSX MILL Series

☞ J 20, J 21

GSX MILL Anti-vibration Type (Square/Radius)

■ Characteristics and Applications

- Optimized irregular pitch and lead affords:
  - Drastically improved chattering and fracture resistance !
  - Less cutting force Allows high-speed, high-feed cutting.
- Rounded lands greatly improve machined surface quality (from ø 4 and up).
- New fine-grained carbide substrate and special coating for better rigidity and thermal and wear resistance.

■ Product Range

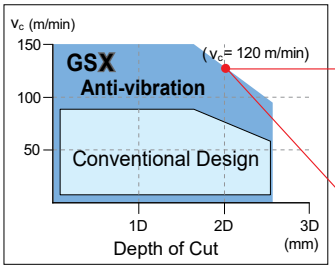
GSX MILL Anti-vibration Square Type

Series	No. of Teeth	Serie	DC (mm)
GSXVL4000-2.5D	4 Flutes	⇨ J 20	ø 2 – ø 20

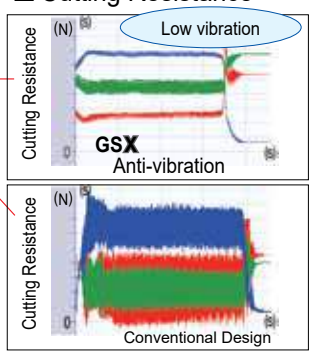
GSX MILL Anti-vibration Corner Radius Type

Series	No. of Teeth	Serie	DC (mm)
GSXVL4000-R-2.5D	4 Flutes	⇨ J 21	ø 3 – ø 20

■ Cutting Range



■ Cutting Resistance

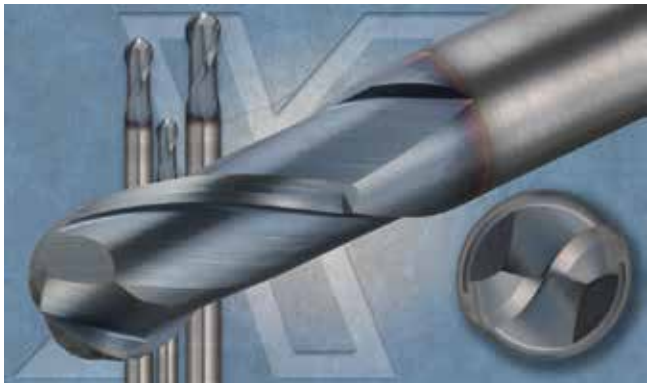


■ Application Range

● Surface Finish Quality

GSX Anti-vibration	Competitor's Anti-vibration	Conventional Design
No Chattering Clean Surface	Minute Chattering Poor Surface	Heavy Chattering Poor Surface

Work material:	C50	Cutting Conditions:	n = 4.800 rpm v_f = 800 mm/min
Grooving:		Depth of cut	a_p = 10 mm
Tool dimension:	ø 10	Equipment:	BT50



+ J 34

GSX MILL Ball

■ Characteristics and Applications

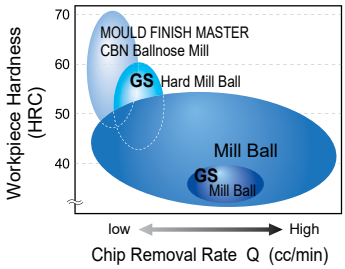
- New coating combined with a fine-grained carbide substrate affords better thermal and wear resistance.
- Large helix angle on cutting edge reduces cutting resistance.
- Unique pocket design and expanded pocket area promotes better chip evacuation.

☒ Expands the range of machineable material from soft to hardened steels, and offers reliability and longer tool life.

■ Product Range

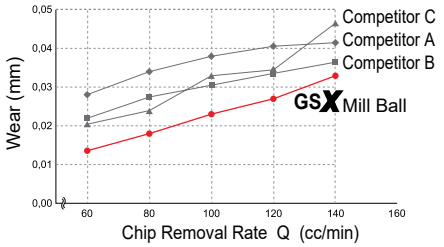
Series	No. of Teeth	Serie	DC (mm)
GSX-B 20000	2 Flutes	⇨ J 36	R=ø0,2 – ø15 (DC=0,2 – 30)

■ Application Range



■ Application Examples

● Flank Wear



GSX Ball (Cutting Length 140 m)	Conventional Tool (Cutting Length 80 m)
Able to continue	Unable to continue

Work Material :	X40CrVMo5-1 (50HRC)	Chipping in centre Heavy wear on flank face
Tool Dimensions :	R3 (2 Flutes)	
Cutting Conditions :	v_c= 179 m/min (n = 9.500 rpm) v_f= 2.250 mm/min (f_z = 0,12 mm/t)	

a_p = 0,2 ~ 1,0 mm, a_e = 0,3 mm, wet
Equipment Vertical Machining Centre BT40

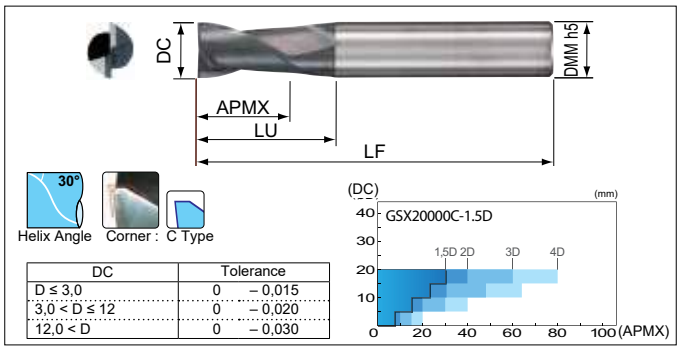
● = Euro stock
❍ = Japan stock

GSX MILL Endmills

GSX 20000C-1.5D Type

Coated Carbide — Grades
GSX — Coating

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 20100C-1.5D	●	1,0	1,5	2,5	40	4
GSX 20150C-1.5D	❍	1,5	2,3	3,3	40	4
GSX 20200C-1.5D	●	2,0	3,0	4,0	40	4
GSX 20250C-1.5D	●	2,5	3,8	4,8	40	4
GSX 20300C-1.5D	●	3,0	4,5	6,0	45	6
GSX 20350C-1.5D	●	3,5	5,3	6,8	45	6
GSX 20400C-1.5D	●	4,0	6,0	7,5	45	6
GSX 20450C-1.5D	●	4,5	6,8	8,3	50	6
GSX 20500C-1.5D	●	5,0	7,5	9,5	50	6
GSX 20550C-1.5D		5,5	8,3	10,3	50	6
GSX 20600C-1.5D	●	6,0	9,0	–	50	6
GSX 20700C-1.5D		7,0	11,0	13,0	60	8
GSX 20800C-1.5D	●	8,0	12,0	–	60	8
GSX 20900C-1.5D	●	9,0	14,0	16,0	70	10
GSX 21000C-1.5D	●	10,0	15,0	–	70	10
GSX 21200C-1.5D	●	12,0	18,0	–	75	12
GSX 21400C-1.5D		14,0	21,0	24,5	90	16
GSX 21500C-1.5D		15,0	23,0	26,5	90	16
GSX 21600C-1.5D		16,0	24,0	–	90	16
GSX 22000C-1.5D		20,0	30,0	–	100	20

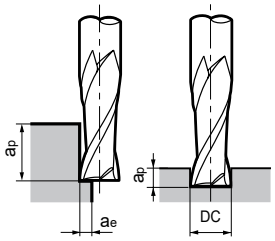
Endmill Identification (GSX MILL Series)

GSX	2	0100	C	-	1.5D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	250	19.600	250	19.600	250	18.300	180	12.700	100	9.000	60	11.000	70	9.000	50
2,0	11.200	340	11.200	340	11.200	340	10.500	240	7.300	130	5.300	80	6.400	90	5.300	70
4,0	6.400	460	6.400	460	6.400	460	6.000	320	4.200	180	3.000	110	3.600	120	3.000	90
6,0	4.600	560	4.600	560	4.600	560	4.300	400	3.000	210	2.200	130	2.700	140	2.200	100
8,0	3.400	560	3.400	560	3.400	560	3.200	400	2.200	210	1.600	130	2.000	140	1.600	100
10,0	2.800	560	2.800	560	2.800	560	2.600	400	1.800	210	1.300	130	1.600	140	1.300	100
12,0	2.300	560	2.300	560	2.300	560	2.200	400	1.500	210	1.100	130	1.300	140	1.100	100
16,0	1.700	450	1.700	450	1.700	450	1.600	320	1.100	180	800	100	1.000	110	800	85
20,0	1.350	380	1.350	380	1.350	380	1.300	280	900	160	650	90	800	100	650	75
Shoulder cutting ap	1,5 DC										1,0 DC					
Shoulder cutting ae	0,05 DC										0,02 DC					

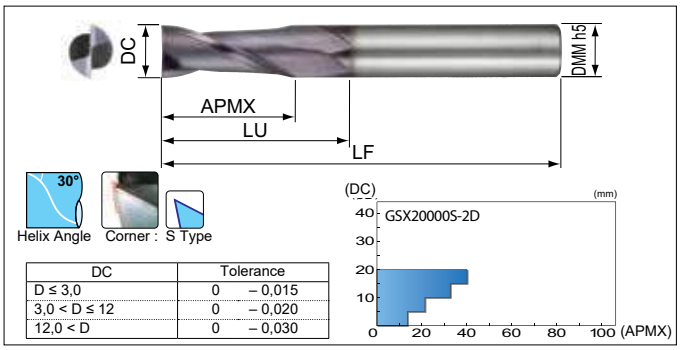
Grooving

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	200	19.600	250	19.600	250	18.300	180	12.700	100	9.000	60	11.000	50	4.500	20
2,0	11.200	270	11.200	340	11.200	340	10.500	240	7.300	130	5.300	80	6.400	65	2.650	25
4,0	6.400	370	6.400	460	6.400	460	6.000	320	4.200	180	3.000	110	3.600	80	1.500	35
6,0	4.600	450	4.600	560	4.600	560	4.300	400	3.000	210	2.200	130	2.700	100	1.100	40
8,0	3.400	450	3.400	560	3.400	560	3.200	400	2.200	210	1.600	130	2.000	100	800	40
10,0	2.800	450	2.800	560	2.800	560	2.600	400	1.800	210	1.300	130	1.600	100	650	40
12,0	2.300	450	2.300	560	2.300	560	2.200	400	1.500	210	1.100	130	1.300	100	500	40
16,0	1.700	360	1.700	450	1.700	450	1.600	320	1.100	180	800	100	1.000	80	400	35
20,0	1.350	300	1.350	380	1.350	380	1.300	280	900	160	650	90	800	70	320	30
Grooving ap	0,2 DC		0,5 DC						0,2 DC		0,05 DC		0,2 DC			

GSX 20000S-2D Type

Coated Carbide — Grades
GSX — Coating

Structural Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			



DC	Tolerance	
D ≤ 3,0	0	– 0,015
3,0 < D ≤ 12	0	– 0,020
12,0 < D	0	– 0,030

Grade: ACF20

■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 20030S-2D	❍	0,3	0,6	1,0	40	4
GSX 20040S-2D	❍	0,4	0,8	1,2	40	4
GSX 20050S-2D	❍	0,5	1,3	1,7	40	4
GSX 20080S-2D	❍	0,8	1,6	2,1	40	4
GSX 20100S-2D	●	1,0	2,5	3,5	40	4
GSX 20150S-2D	●	1,5	3,8	4,8	40	4
GSX 20200S-2D	●	2,0	5,0	6,0	40	4
GSX 20250S-2D	●	2,5	6,3	7,3	40	4
GSX 20300S-2D	●	3,0	7,5	9,0	45	6
GSX 20350S-2D	●	3,5	8,8	10,3	45	6
GSX 20400S-2D	●	4,0	11,0	14,0	45	6
GSX 20450S-2D	●	4,5	11,3	12,8	50	6
GSX 20500S-2D	●	5,0	13,0	19,6	50	6
GSX 20550S-2D		5,5	13,0	19,6	50	6
GSX 20600S-2D	●	6,0	13,0	–	50	6
GSX 20700S-2D	●	7,0	16,0	21,1	60	8
GSX 20800S-2D	●	8,0	19,0	–	60	8
GSX 20900S-2D	●	9,0	19,0	24,1	70	10
GSX 21000S-2D	●	10,0	22,0	–	70	10
GSX 21200S-2D	●	12,0	26,0	–	75	12
GSX 21600S-2D	❍	16,0	32,0	–	90	16
GSX 22000S-2D	❍	20,0	40,0	–	100	20

■ Endmill Identification (GSX MILL Series)

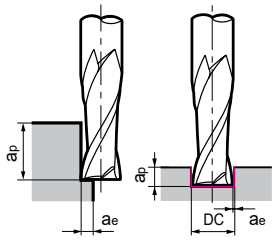
GSX 2 0050 S - 2D

GSX	2	0050	S	-	2D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. This series is not recommended for grooving.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	16.600	180	16.600	180	16.600	180	15.500	130	10.500	70	7.500	45	9.400	50	7.500	35
2,0	9.500	250	9.500	250	9.500	250	9.000	200	6.200	100	4.500	60	5.400	70	4.500	50
4,0	5.400	330	5.400	330	5.400	330	5.000	250	3.400	120	2.500	75	3.000	90	2.500	65
6,0	4.000	400	4.000	400	4.000	400	3.700	300	2.550	150	1.900	100	2.300	110	1.900	80
8,0	3.000	400	3.000	400	3.000	400	2.800	300	1.900	150	1.400	100	1.700	110	1.400	80
10,0	2.400	400	2.400	400	2.400	400	2.200	300	1.500	150	1.100	100	1.300	110	1.100	80
12,0	2.000	400	2.000	400	2.000	400	1.850	300	1.300	150	950	100	1.100	110	950	80
16,0	1.500	330	1.500	330	1.500	330	1.400	250	950	120	700	75	850	85	700	60
20,0	1.200	280	1.200	280	1.200	280	1.100	220	750	110	550	65	650	75	550	55
Shoulder cutting ap	1,5 DC										1,0 DC					
Shoulder cutting ae	0,05 DC										0,02 DC					

● Groove Finishing

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	16.600	180	16.600	180	16.600	180	15.500	130	10.500	70	7.500	45	9.400	50	7.500	35
2,0	9.500	250	9.500	250	9.500	250	9.000	200	6.200	100	4.500	60	5.400	70	4.500	50
4,0	5.400	330	5.400	330	5.400	330	5.000	250	3.400	120	2.500	75	3.000	90	2.500	65
6,0	4.000	400	4.000	400	4.000	400	3.700	300	2.550	150	1.900	100	2.300	110	1.900	80
8,0	3.000	400	3.000	400	3.000	400	2.800	300	1.900	150	1.400	100	1.700	110	1.400	80
10,0	2.400	400	2.400	400	2.400	400	2.200	300	1.500	150	1.100	100	1.300	110	1.100	80
12,0	2.000	400	2.000	400	2.000	400	1.850	300	1.300	150	950	100	1.100	110	950	80
16,0	1.500	330	1.500	330	1.500	330	1.400	250	950	120	700	75	850	85	700	60
20,0	1.200	280	1.200	280	1.200	280	1.100	220	750	110	550	65	650	75	550	55
Groove finishing ap	1,5 DC															
Groove finishing ae	–0,02 DC															

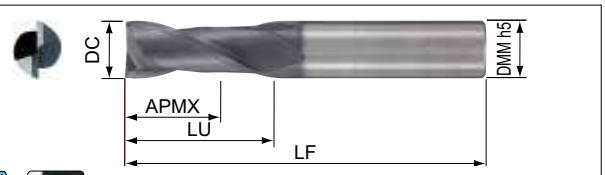
● = Euro stock
❍ = Japan stock

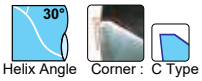
GSX MILL Endmills

GSX 20000C-2D Type

Coated Carbide — Grades
GSX — Coating

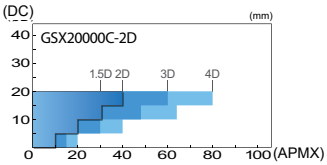
Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			





Helix Angle Corner : C Type

DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030



Grade: ACF20

Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 20050C-2D	❍	0,5	1,0	1,4	40	4
GSX 20100C-2D	●	1,0	2,0	3,0	40	4
GSX 20150C-2D	❍	1,5	3,0	4,0	40	4
GSX 20200C-2D	●	2,0	4,0	5,0	40	4
GSX 20250C-2D	●	2,5	5,0	6,0	40	4
GSX 20300C-2D	●	3,0	6,0	7,5	45	6
GSX 20350C-2D		3,5	7,0	8,5	45	6
GSX 20400C-2D	●	4,0	8,0	9,5	45	6
GSX 20450C-2D	●	4,5	9,0	10,5	50	6
GSX 20500C-2D	●	5,0	10,0	12,0	50	6
GSX 20550C-2D		5,5	11,0	13,0	50	6
GSX 20600C-2D	●	6,0	12,0	—	50	6
GSX 20700C-2D	●	7,0	14,0	16,0	60	8
GSX 20800C-2D	●	8,0	16,0	—	60	8
GSX 20900C-2D	❍	9,0	18,0	20,0	70	10
GSX 21000C-2D	●	10,0	20,0	—	70	10
GSX 21200C-2D	●	12,0	24,0	—	75	12
GSX 21400C-2D		14,0	28,0	31,5	90	16
GSX 21500C-2D		15,0	30,0	33,5	90	16
GSX 21600C-2D	●	16,0	32,0	—	90	16
GSX 22000C-2D	●	20,0	40,0	—	100	20

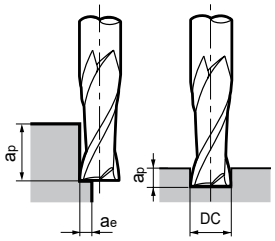
Endmill Identification (GSX MILL Series)

GSX	2	0050	C	-	2D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	250	19.600	250	19.600	250	18.300	180	12.700	100	9.000	60	11.000	70	9.000	50
2,0	11.200	340	11.200	340	11.200	340	10.500	240	7.300	130	5.300	80	6.400	90	5.300	70
4,0	6.400	460	6.400	460	6.400	460	6.000	320	4.200	180	3.000	110	3.600	120	3.000	90
6,0	4.600	560	4.600	560	4.600	560	4.300	400	3.000	210	2.200	130	2.700	140	2.200	100
8,0	3.400	560	3.400	560	3.400	560	3.200	400	2.200	210	1.600	130	2.000	140	1.600	100
10,0	2.800	560	2.800	560	2.800	560	2.600	400	1.800	210	1.300	130	1.600	140	1.300	100
12,0	2.300	560	2.300	560	2.300	560	2.200	400	1.500	210	1.100	130	1.300	140	1.100	100
16,0	1.700	450	1.700	450	1.700	450	1.600	320	1.100	180	800	100	1.000	110	800	85
20,0	1.350	380	1.350	380	1.350	380	1.300	280	900	160	650	90	800	100	650	75
Shoulder cutting ap	1,5 DC										1,0 DC					
Shoulder cutting ae	0,05 DC										0,02 DC					

● Grooving

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	200	19.600	250	19.600	250	18.300	180	12.700	100	9.000	60	11.000	50	4.500	20
2,0	11.200	270	11.200	340	11.200	340	10.500	240	7.300	130	5.300	80	6.400	65	2.650	25
4,0	6.400	370	6.400	460	6.400	460	6.000	320	4.200	180	3.000	110	3.600	80	1.500	35
6,0	4.600	450	4.600	560	4.600	560	4.300	400	3.000	210	2.200	130	2.700	100	1.100	40
8,0	3.400	450	3.400	560	3.400	560	3.200	400	2.200	210	1.600	130	2.000	100	800	40
10,0	2.800	450	2.800	560	2.800	560	2.600	400	1.800	210	1.300	130	1.600	100	650	40
12,0	2.300	450	2.300	560	2.300	560	2.200	400	1.500	210	1.100	130	1.300	100	500	40
16,0	1.700	360	1.700	450	1.700	450	1.600	320	1.100	180	800	100	1.000	80	400	35
20,0	1.350	300	1.350	380	1.350	380	1.300	280	900	160	650	90	800	70	320	30
Grooving ap	0,2 DC		0,5 DC						0,2 DC		0,05 DC		0,2 DC			

GSX 20000C-3D Type

Coated Carbide — Grades
GSX — Coating

Structural Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
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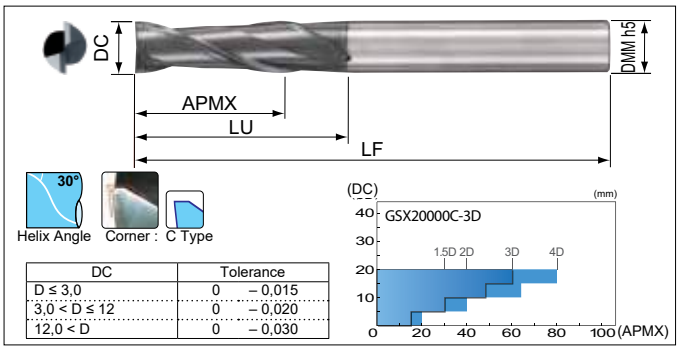


DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 20100C-3D	●	1,0	3,0	4,0	40	4
GSX 20150C-3D	●	1,5	4,5	5,5	40	4
GSX 20200C-3D	●	2,0	6,0	7,0	40	4
GSX 20250C-3D	●	2,5	7,5	8,5	40	4
GSX 20300C-3D	●	3,0	9,0	10,5	50	6
GSX 20400C-3D	●	4,0	12,0	13,5	50	6
GSX 20500C-3D	●	5,0	15,0	17,0	50	6
GSX 20600C-3D	●	6,0	18,0	—	50	6
GSX 20800C-3D	●	8,0	24,0	—	70	8
GSX 21000C-3D	●	10,0	30,0	—	90	10
GSX 21200C-3D	●	12,0	36,0	—	90	12
GSX 21600C-3D	●	16,0	48,0	—	110	16
GSX 22000C-3D	❍	20,0	60,0	—	120	20

■ Endmill Identification (GSX MILL Series)

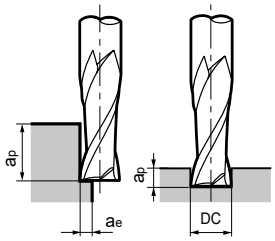
GSX 2 0100 C - 3D

GSX	2	0100	C	-	3D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rare cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	16.600	190	16.600	190	16.600	190	15.500	140	10.500	70	7.500	45	9.400	50	7.500	35
2,0	9.500	250	9.500	250	9.500	250	9.000	200	6.200	120	4.500	60	5.200	70	4.500	50
4,0	5.200	330	5.200	330	5.200	330	4.800	200	3.400	150	2.250	75	2.600	90	2.250	65
6,0	3.500	360	3.500	360	3.500	360	3.200	250	2.550	170	1.500	90	1.700	100	1.500	80
8,0	2.600	320	2.600	320	2.600	320	2.400	240	1.900	170	1.100	90	1.300	105	1.100	80
10,0	2.100	300	2.100	300	2.100	300	1.900	230	1.500	170	900	90	1.000	100	900	80
12,0	1.750	280	1.750	280	1.750	280	1.600	230	1.250	170	750	90	850	100	750	80
16,0	1.300	240	1.300	240	1.300	240	1.200	200	950	150	550	75	650	85	550	65
20,0	1.050	220	1.050	220	1.050	220	950	180	750	140	450	70	500	75	450	60
Shoulder cutting ap	2,5 DC								2,0 DC							
Shoulder cutting ae	< ø3: 0,05 DC , ≤ ø3: 0,1 DC								0,02 DC							

● Grooving

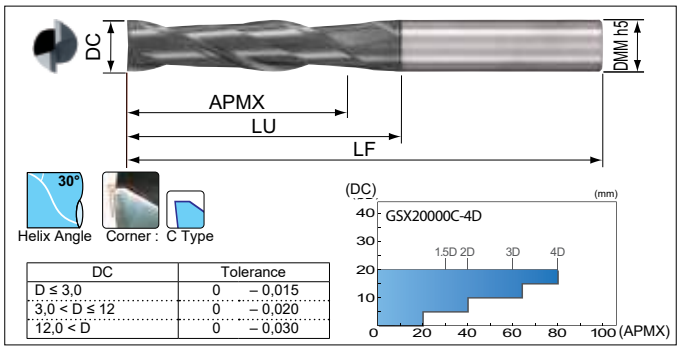
Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	16.600	70	16.600	80	16.600	80	15.500	50	10.500	50	7.500	35	9.400	30	3.750	10
2,0	9.500	80	9.500	100	9.500	100	9.000	90	6.200	60	4.500	45	5.200	40	2.250	15
4,0	5.200	120	5.200	150	5.200	150	4.800	120	3.400	80	2.200	50	2.600	50	1.250	20
6,0	3.500	140	3.500	170	3.500	170	3.200	130	2.550	100	1.500	50	1.700	60	950	25
8,0	2.600	140	2.600	160	2.600	160	2.400	130	1.900	100	1.100	50	1.300	60	700	25
10,0	2.100	130	2.100	150	2.100	150	1.900	120	1.500	90	900	50	1.000	60	550	25
12,0	1.750	130	1.750	150	1.750	150	1.600	120	1.250	90	750	50	850	60	450	25
16,0	1.300	110	1.300	130	1.300	130	1.200	110	950	80	550	45	650	50	350	20
20,0	1.050	100	1.050	120	1.050	120	950	100	750	70	450	40	500	40	280	15
Grooving ap / ae	0,1 DC		0,2 DC								0,05 DC		0,1 *D*			

● = Euro stock
❍ = Japan stock

GSX MILL Endmills
GSX 20000C-4D Type

Coated Carbide — Grades
GSX — Coating

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 20100C-4D	●	1,0	4,0	5,0	40	4
GSX 20150C-4D	●	1,5	6,0	7,0	40	4
GSX 20200C-4D	●	2,0	8,0	9,0	40	4
GSX 20250C-4D	●	2,5	10,0	11,0	50	4
GSX 20300C-4D	●	3,0	12,0	13,5	50	6
GSX 20400C-4D	●	4,0	16,0	17,5	50	6
GSX 20500C-4D	●	5,0	20,0	22,0	60	6
GSX 20600C-4D	●	6,0	24,0	–	60	6
GSX 20800C-4D	●	8,0	32,0	–	80	8
GSX 21000C-4D	●	10,0	40,0	–	90	10
GSX 21200C-4D	❍	12,0	48,0	–	100	12
GSX 21600C-4D	❍	16,0	64,0	–	120	16
GSX 22000C-4D	❍	20,0	80,0	–	140	20

■ Endmill Identification (GSX MILL Series)

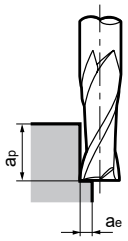
GSX 2 0100 C - 4D

GSX	2	0100	C	-	4D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rear cases, chattering may occur in early milling stages, dissipating after 2 m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. This series is not recommended for grooving.
7. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



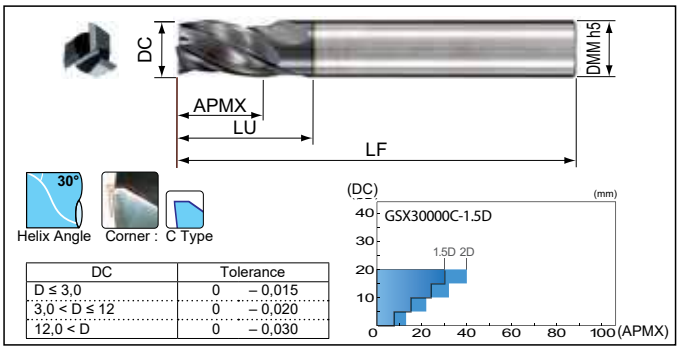
● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	9.000	130	9.000	130	9.000	130	7.000	95	6.500	50	4.500	30	5.400	40	4.500	25
2,0	4.500	180	4.500	180	4.500	180	3.500	120	3.200	70	2.300	40	2.700	50	2.300	35
4,0	2.250	240	2.250	240	2.250	240	1.750	160	1.600	95	1.200	60	1.350	65	1.200	40
6,0	1.500	300	1.500	300	1.500	300	1.150	170	1.050	110	800	70	900	70	800	50
8,0	1.100	260	1.100	260	1.100	260	850	170	800	110	600	70	660	70	600	50
10,0	900	250	900	250	900	250	700	160	650	110	460	70	540	70	460	50
12,0	750	240	750	240	750	240	580	160	520	110	400	70	450	70	400	50
16,0	550	200	550	200	550	200	440	140	400	95	300	55	330	60	300	45
20,0	450	180	450	180	450	180	350	120	320	85	240	45	270	50	240	40
Shoulder cutting ap	3,5 DC										3,0 DC					
Shoulder cutting ae	0,08 DC						0,04 DC									

GSX 30000C-1.5D Type

Coated Carbide — Grades
GSX — Coating

Structural Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎			◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 30100C-1.5D	●	1,0	1,5	2,5	40	4
GSX 30150C-1.5D	●	1,5	2,3	3,3	40	4
GSX 30200C-1.5D	●	2,0	3,0	4,0	40	4
GSX 30250C-1.5D	●	2,5	3,8	4,8	40	4
GSX 30300C-1.5D	●	3,0	4,5	6,0	45	6
GSX 30400C-1.5D	●	4,0	6,0	7,5	45	6
GSX 30500C-1.5D	●	5,0	7,5	9,5	50	6
GSX 30600C-1.5D	●	6,0	9,0	–	50	6
GSX 30700C-1.5D	●	7,0	11,0	13,0	60	8
GSX 30800C-1.5D	●	8,0	12,0	–	60	8
GSX 30900C-1.5D	❍	9,0	14,0	16,0	70	10
GSX 31000C-1.5D	●	10,0	15,0	–	70	10
GSX 31200C-1.5D	●	12,0	18,0	–	75	12
GSX 31600C-1.5D		16,0	24,0	–	90	16
GSX 32000C-1.5D		20,0	30,0	–	100	20

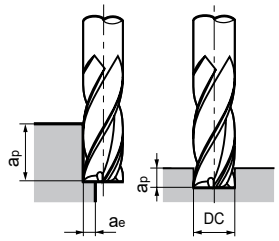
Endmill Identification (GSX MILL Series)

GSX	3	0100	C	-	1.5D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	300	19.600	300	19.600	300	18.300	210	12.700	130	9.000	80	11.000	90	9.000	65
2,0	11.200	410	11.200	410	11.200	410	10.500	280	7.300	170	5.300	100	6.400	120	5.300	90
4,0	6.400	550	6.400	550	6.400	550	6.000	370	4.200	230	3.000	140	3.600	150	3.000	120
6,0	4.600	670	4.600	670	4.600	670	4.300	460	3.000	270	2.200	170	2.700	180	2.200	130
8,0	3.400	670	3.400	670	3.400	670	3.200	460	2.200	270	1.600	170	2.000	180	1.600	130
10,0	2.800	670	2.800	670	2.800	670	2.600	460	1.800	270	1.300	170	1.600	180	1.300	130
12,0	2.300	670	2.300	670	2.300	670	2.200	460	1.500	270	1.100	170	1.300	180	1.100	130
16,0	1.700	550	1.700	550	1.700	550	1.600	370	1.100	230	800	140	1.000	150	800	100
20,0	1.350	490	1.350	490	1.350	490	1.300	330	900	210	650	120	800	130	650	90
Shoulder cutting ap	1,5 DC								1,0 DC							
Shoulder cutting ae	0,05 DC								0,02 DC							

Grooving

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	240	19.600	300	19.600	300	18.300	210	12.700	130	9.000	80	11.000	65	4.500	25
2,0	11.200	320	11.200	410	11.200	410	10.500	280	7.300	170	5.300	100	6.400	85	2.650	35
4,0	6.400	450	6.400	550	6.400	550	6.000	370	4.200	230	3.000	140	3.600	100	1.500	50
6,0	4.600	540	4.600	670	4.600	670	4.300	460	3.000	270	2.200	170	2.650	130	1.150	55
8,0	3.400	540	3.400	670	3.400	670	3.200	460	2.200	270	1.600	170	2.000	130	800	55
10,0	2.800	540	2.800	670	2.800	670	2.600	460	1.800	270	1.300	170	1.600	130	650	55
12,0	2.300	540	2.300	670	2.300	670	2.200	460	1.500	270	1.100	170	1.300	130	500	55
16,0	1.700	440	1.700	550	1.700	550	1.600	370	1.100	230	800	140	1.000	110	400	45
20,0	1.350	390	1.350	490	1.350	490	1.300	330	900	210	650	120	800	90	320	40
Grooving ap / ae	0,2 DC		0,5 DC								0,05 DC		0,2 DC			

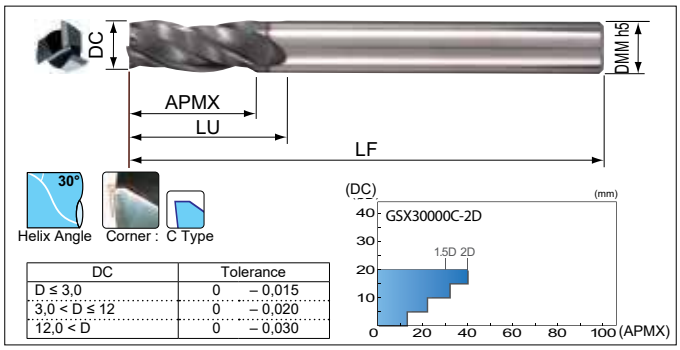
● = Euro stock
❍ = Japan stock

GSX MILL Endmills

GSX 30000C-2D Type

Coated Carbide — Grades
GSX — Coating

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎			◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 30100C-2D	❍	1,0	2,5	3,5	40	4
GSX 30150C-2D	●	1,5	3,8	4,8	40	4
GSX 30200C-2D	●	2,0	5,0	6,0	40	4
GSX 30250C-2D	●	2,5	6,3	7,3	40	4
GSX 30300C-2D	●	3,0	7,5	9,0	45	6
GSX 30400C-2D	●	4,0	11,0	12,5	45	6
GSX 30500C-2D	●	5,0	13,0	15,0	50	6
GSX 30600C-2D	●	6,0	13,0	–	50	6
GSX 30700C-2D	●	7,0	16,0	18,0	60	8
GSX 30800C-2D	●	8,0	19,0	–	60	8
GSX 30900C-2D	●	9,0	19,0	21,0	70	10
GSX 31000C-2D	●	10,0	22,0	–	70	10
GSX 31200C-2D	●	12,0	26,0	–	75	12
GSX 31600C-2D		16,0	32,0	–	90	16
GSX 32000C-2D		20,0	40,0	–	100	20

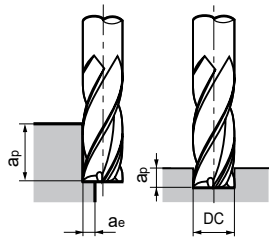
■ Endmill Identification (GSX MILL Series)

GSX	3	0100	C	-	2D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	300	19.600	300	19.600	300	18.300	210	12.700	130	9.000	80	11.000	90	9.000	65
2,0	11.200	410	11.200	410	11.200	410	10.500	280	7.300	170	5.300	100	6.400	120	5.300	90
4,0	6.400	550	6.400	550	6.400	550	6.000	370	4.200	230	3.000	140	3.600	150	3.000	120
6,0	4.600	670	4.600	670	4.600	670	4.300	460	3.000	270	2.200	170	2.700	180	2.200	130
8,0	3.400	670	3.400	670	3.400	670	3.200	460	2.200	270	1.600	170	2.000	180	1.600	130
10,0	2.800	670	2.800	670	2.800	670	2.600	460	1.800	270	1.300	170	1.600	180	1.300	130
12,0	2.300	670	2.300	670	2.300	670	2.200	460	1.500	270	1.100	170	1.300	180	1.100	130
16,0	1.700	550	1.700	550	1.700	550	1.600	370	1.100	230	800	140	1.000	150	800	100
20,0	1.350	490	1.350	490	1.350	490	1.300	330	900	210	650	120	800	130	650	90
Shoulder cutting a_p	1,5 DC										1,0 DC					
Shoulder cutting a_e	0,05 DC										0,02 DC					

● Grooving

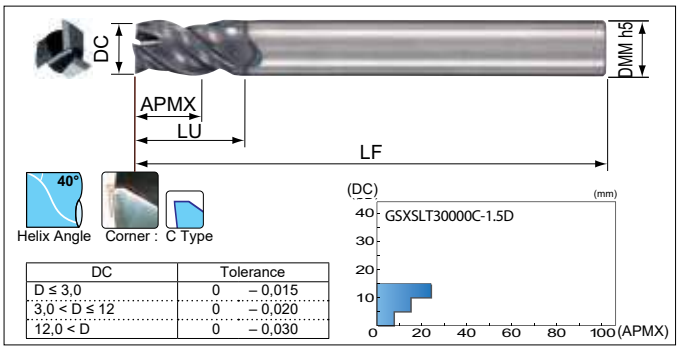
Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	240	19.600	300	19.600	300	18.300	210	12.700	130	9.000	80	11.000	65	4.500	25
2,0	11.200	320	11.200	410	11.200	410	10.500	280	7.300	170	5.300	100	6.400	85	2.650	35
4,0	6.400	450	6.400	550	6.400	550	6.000	370	4.200	230	3.000	140	3.600	100	1.500	50
6,0	4.600	540	4.600	670	4.600	670	4.300	460	3.000	270	2.200	170	2.650	130	1.150	55
8,0	3.400	540	3.400	670	3.400	670	3.200	460	2.200	270	1.600	170	2.000	130	800	55
10,0	2.800	540	2.800	670	2.800	670	2.600	460	1.800	270	1.300	170	1.600	130	650	55
12,0	2.300	540	2.300	670	2.300	670	2.200	460	1.500	270	1.100	170	1.300	130	500	55
16,0	1.700	440	1.700	550	1.700	550	1.600	370	1.100	230	800	140	1.000	110	400	45
20,0	1.350	390	1.350	490	1.350	490	1.300	330	900	210	650	120	800	90	320	40
Grooving a_p	0,2 DC		0,5 DC						0,2 DC		0,05 DC		0,2 DC			

GSXSLT 30000C-1.5D Type

For Compound Endmilling

Coated Carbide — Grades
GSX — Coating

Structural Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎			◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

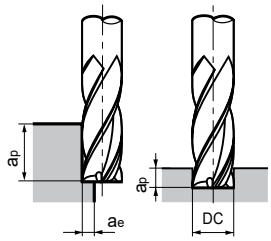
■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSXSLT 30100C-1.5D	●	1,0	1,5	2,5	40	4
GSXSLT 30150C-1.5D	●	1,5	2,3	3,3	40	4
GSXSLT 30200C-1.5D		2,0	3,0	4,0	40	4
GSXSLT 30250C-1.5D	❍	2,5	3,8	4,8	40	4
GSXSLT 30300C-1.5D	●	3,0	4,5	6,0	45	6
GSXSLT 30400C-1.5D	●	4,0	6,0	7,5	45	6
GSXSLT 30500C-1.5D	●	5,0	7,5	9,5	50	6
GSXSLT 30600C-1.5D	●	6,0	9,0	–	50	6
GSXSLT 30700C-1.5D	●	7,0	11,0	13,0	60	8
GSXSLT 30800C-1.5D	●	8,0	12,0	–	60	8
GSXSLT 30900C-1.5D	●	9,0	14,0	16,0	70	10
GSXSLT 31000C-1.5D	●	10,0	15,0	–	70	10
GSXSLT 31200C-1.5D	●	12,0	18,0	–	75	12
GSXSLT 31600C-1.5D		16,0	24,0	–	90	16

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. Use step machining of 0.1Dc when drilling stainless steel, heat resistant alloy, and titanium alloy.
5. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	300	19.600	300	19.600	300	18.300	210	12.700	130	9.000	80	11.000	90	9.000	65
2,0	11.200	410	11.200	410	11.200	410	10.500	280	7.300	170	5.300	100	6.400	120	5.300	90
4,0	6.400	550	6.400	550	6.400	550	6.000	370	4.200	230	3.000	140	3.600	150	3.000	120
6,0	4.600	670	4.600	670	4.600	670	4.300	460	3.000	270	2.200	170	2.700	180	2.200	130
8,0	3.400	670	3.400	670	3.400	670	3.200	460	2.200	270	1.600	170	2.000	180	1.600	130
10,0	2.800	670	2.800	670	2.800	670	2.600	460	1.800	270	1.300	170	1.600	180	1.300	130
12,0	2.300	670	2.300	670	2.300	670	2.200	460	1.500	270	1.100	170	1.300	180	1.100	130
16,0	1.700	550	1.700	550	1.700	550	1.600	370	1.100	230	800	140	1.000	150	800	100
Shoulder cutting ap	1.5 DC										1.0 DC					
Shoulder cutting ae	0.05 DC										0.02 DC					

● Grooving

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	240	19.600	300	19.600	300	18.300	210	12.700	130	9.000	80	11.000	65	4.500	25
2,0	11.200	320	11.200	410	11.200	410	10.500	280	7.300	170	5.300	100	6.400	85	2.650	35
4,0	6.400	450	6.400	550	6.400	550	6.000	370	4.200	230	3.000	140	3.600	100	1.500	50
6,0	4.600	540	4.600	670	4.600	670	4.300	460	3.000	270	2.200	170	2.650	130	1.150	55
8,0	3.400	540	3.400	670	3.400	670	3.200	460	2.200	270	1.600	170	2.000	130	800	55
10,0	2.800	540	2.800	670	2.800	670	2.600	460	1.800	270	1.300	170	1.600	130	650	55
12,0	2.300	540	2.300	670	2.300	670	2.200	460	1.500	270	1.100	170	1.300	130	500	55
16,0	1.700	440	1.700	550	1.700	550	1.600	370	1.100	230	800	140	1.000	110	400	45
Grooving ap	0,2 DC		0,5 DC						0,2 DC		0,05 DC		0,2 DC			

● Drilling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	19.600	70	19.600	90	19.600	90	18.300	60	12.700	40	9.000	25	11.000	20	4.500	10
2,0	11.200	90	11.200	120	11.200	120	10.500	80	7.300	50	5.300	30	6.400	25	2.650	15
4,0	6.400	130	6.400	160	6.400	160	6.000	110	4.200	70	3.000	40	3.600	30	1.500	20
6,0	4.600	160	4.600	200	4.600	200	4.300	130	3.000	80	2.200	50	2.650	40	1.150	20
8,0	3.400	160	3.400	200	3.400	200	3.200	130	2.200	80	1.600	50	2.000	40	800	20
10,0	2.800	160	2.800	200	2.800	200	2.600	130	1.800	80	1.300	50	1.600	40	650	20
12,0	2.300	160	2.300	200	2.300	200	2.200	130	1.500	80	1.100	50	1.300	40	500	20
16,0	1.700	130	1.700	160	1.700	160	1.600	110	1.100	70	800	40	1.000	35	400	15

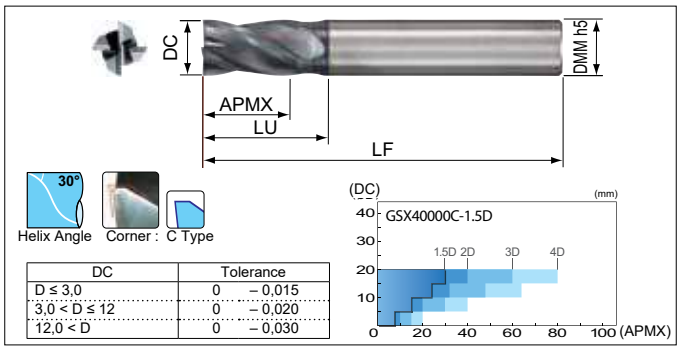
● = Euro stock
❍ = Japan stock

GSX MILL Endmills

GSX 40000C-1.5D Type

Coated Carbide — Grades
GSX — Coating

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

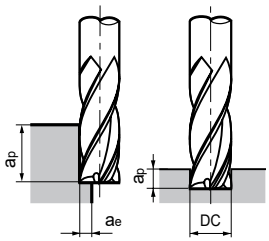
Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 40100C-1.5D	●	1,0	1,5	2,5	40	4
GSX 40150C-1.5D	●	1,5	2,3	3,3	40	4
GSX 40200C-1.5D	●	2,0	3,0	4,0	40	4
GSX 40250C-1.5D	●	2,5	3,8	4,8	40	4
GSX 40300C-1.5D	●	3,0	4,5	6,0	45	6
GSX 40350C-1.5D	●	3,5	5,3	6,8	45	6
GSX 40400C-1.5D	●	4,0	6,0	7,5	45	6
GSX 40450C-1.5D	●	4,5	6,8	8,3	50	6
GSX 40500C-1.5D	●	5,0	7,5	9,5	50	6
GSX 40550C-1.5D	❍	5,5	8,3	10,3	50	6
GSX 40600C-1.5D	●	6,0	9,0	–	50	6
GSX 40700C-1.5D	●	7,0	11,0	13,0	60	8
GSX 40800C-1.5D	●	8,0	12,0	–	60	8
GSX 40900C-1.5D	●	9,0	14,0	16,0	70	10
GSX 41000C-1.5D	●	10,0	15,0	–	70	10
GSX 41200C-1.5D	●	12,0	18,0	–	75	12
GSX 41400C-1.5D	❍	14,0	21,0	24,5	90	16
GSX 41500C-1.5D	❍	15,0	23,0	26,5	90	16
GSX 41600C-1.5D	❍	16,0	24,0	–	90	16
GSX 42000C-1.5D	❍	20,0	30,0	–	100	20

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	24.000	470	24.000	470	24.000	470	21.000	290	14.500	180	10.500	120	12.600	120	10.500	85
2,0	12.800	570	12.800	570	12.800	570	12.000	380	8.300	230	6.000	150	7.200	160	6.000	110
4,0	6.800	730	6.800	730	6.800	730	6.400	490	4.400	300	3.200	200	3.800	210	3.200	130
6,0	4.600	780	4.600	780	4.600	780	4.300	520	3.000	320	2.200	210	2.650	220	2.200	150
8,0	3.400	780	3.400	780	3.400	780	3.200	520	2.200	320	1.600	210	2.000	220	1.600	150
10,0	2.800	780	2.800	780	2.800	780	2.600	520	1.800	320	1.300	210	1.500	220	1.300	150
12,0	2.300	780	2.300	780	2.300	780	2.200	520	1.500	320	1.100	210	1.300	220	1.100	150
16,0	1.700	650	1.700	650	1.700	650	1.600	420	1.100	280	800	170	1.000	180	800	120
20,0	1.350	600	1.350	600	1.350	600	1.300	380	900	260	650	150	800	160	650	100
Shoulder cutting ap	1,5 DC										1,0 DC					
Shoulder cutting ae	0,05 DC										0,02 DC					

Shoulder Milling (High Speed Machining Centre)

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	60.000	1.200	60.000	1.200	60.000	1.200	60.000	850	60.000	720	48.000	500	32.000	300	–	–
2,0	47.800	2.200	47.800	2.200	47.800	2.200	47.800	1.600	39.800	1.200	31.800	900	15.900	400	–	–
4,0	23.900	2.600	23.900	2.600	23.900	2.600	23.900	1.900	19.900	1.400	15.900	1.100	8.000	490	–	–
6,0	16.000	2.700	16.000	2.700	16.000	2.700	16.000	2.000	13.300	1.500	10.600	1.200	5.300	520	–	–
8,0	12.000	2.700	12.000	2.700	12.000	2.700	12.000	2.000	10.000	1.500	8.000	1.200	4.000	520	–	–
10,0	9.600	2.700	9.600	2.700	9.600	2.700	9.600	2.000	8.000	1.500	6.400	1.200	3.200	520	–	–
12,0	8.000	2.700	8.000	2.700	8.000	2.700	8.000	2.000	6.700	1.500	5.300	1.200	2.700	520	–	–
16,0	6.000	2.200	6.000	2.200	6.000	2.200	6.000	1.600	5.000	1.200	4.000	900	2.000	450	–	–
20,0	4.800	2.000	4.800	2.000	4.800	2.000	4.800	1.400	4.000	1.100	3.200	750	1.600	380	–	–
Shoulder cutting ap	1,5 DC										1,0 DC					
Shoulder cutting ae	0,05 DC										0,02 DC					

Grooving

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	24.000	380	24.000	470	24.000	470	21.000	290	14.500	180	10.500	120	12.600	85	5.200	30
2,0	12.800	460	12.800	570	12.800	570	12.000	380	8.300	230	6.000	150	7.200	110	3.000	40
4,0	6.800	580	6.800	730	6.800	730	5.400	490	4.400	300	3.200	200	3.800	130	1.600	55
6,0	4.600	620	4.600	780	4.600	780	4.300	520	3.000	320	2.200	210	2.650	160	1.100	65
8,0	3.400	620	3.400	780	3.400	780	3.200	520	2.200	320	1.600	210	2.000	160	800	65
10,0	2.800	620	2.800	780	2.800	780	2.600	520	1.800	320	1.300	210	1.600	160	650	65
12,0	2.300	620	2.300	780	2.300	780	2.200	520	1.500	320	1.100	210	1.300	160	550	65
16,0	1.700	520	1.700	560	1.700	560	1.600	420	1.100	280	800	170	1.000	130	400	55
20,0	1.350	480	1.350	600	1.350	600	1.300	380	900	260	650	150	800	110	320	50
Grooving ap	0,2 DC		0,5 DC						0,2 DC		0,05 DC		0,2 DC			

GSX 40000S-2D Type

Coated Carbide — Grades
GSX — Coating

Structural Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
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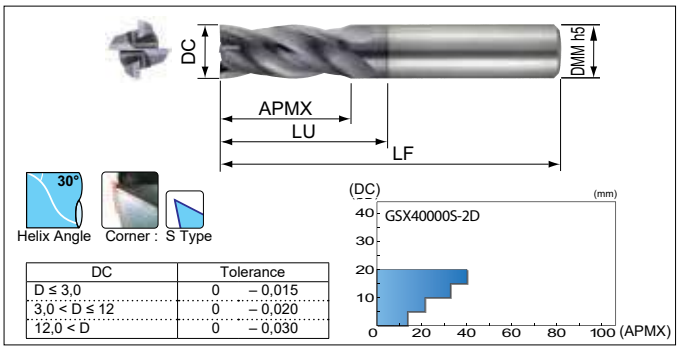


DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 40100S-2D	●	1,0	2,5	3,5	40	4
GSX 40150S-2D	❍	1,5	3,8	4,8	40	4
GSX 40200S-2D	●	2,0	5,0	6,0	40	4
GSX 40250S-2D	●	2,5	6,3	7,3	40	4
GSX 40300S-2D	●	3,0	7,5	9,0	45	6
GSX 40350S-2D	●	3,5	8,8	10,0	45	6
GSX 40400S-2D	●	4,0	11,0	14,0	45	6
GSX 40450S-2D	❍	4,5	11,3	12,8	50	6
GSX 40500S-2D	●	5,0	13,0	19,6	50	6
GSX 40550S-2D	❍	5,5	13,0	19,6	50	6
GSX 40600S-2D	●	6,0	13,0	–	50	6
GSX 40700S-2D	●	7,0	16,0	21,1	60	8
GSX 40800S-2D	●	8,0	19,0	–	60	8
GSX 40900S-2D	❍	9,0	19,0	24,1	70	10
GSX 41000S-2D	●	10,0	22,0	–	70	10
GSX 41200S-2D	●	12,0	26,0	–	75	12
GSX 41600S-2D	●	16,0	32,0	–	90	16
GSX 42000S-2D	●	20,0	40,0	–	100	20

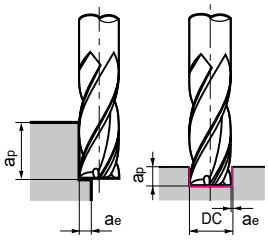
■ Endmill Identification (GSX MILL Series)

GSX	4	1000	S	-	2D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. This series is not recommended for grooving.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	22.000	360	22.000	360	22.000	360	19.000	220	13.000	140	9.500	90	11.300	90	9.500	65
2,0	11.500	440	11.500	440	11.500	440	11.000	290	7.500	180	5.400	110	6.500	120	5.400	85
4,0	6.000	560	6.000	560	6.000	560	5.800	370	4.000	230	2.900	150	3.400	160	2.900	100
6,0	4.200	600	4.200	600	4.200	600	4.000	400	2.700	240	2.000	160	2.400	170	2.000	120
8,0	3.000	600	3.000	600	3.000	600	2.800	400	2.000	240	1.450	160	1.800	170	1.450	120
10,0	2.500	600	2.500	600	2.500	600	2.350	400	1.600	240	1.200	160	1.450	170	1.200	120
12,0	2.100	600	2.100	600	2.100	600	2.000	400	1.350	240	1.000	160	1.200	170	1.000	120
16,0	1.500	500	1.500	500	1.500	500	1.450	320	1.000	210	750	130	900	140	750	90
20,0	1.200	460	1.200	460	1.200	460	1.150	290	800	200	600	110	700	120	600	75
Shoulder cutting ap	2,0 DC															
Shoulder cutting ae	0,03 DC										0,01 DC					

● Groove Finishing

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	22.000	360	22.000	360	22.000	360	19.000	220	13.000	140	9.500	90	11.300	90	9.500	65
2,0	11.500	440	11.500	440	11.500	440	11.000	290	7.500	180	5.400	110	6.500	120	5.400	85
4,0	6.000	560	6.000	560	6.000	560	5.800	370	4.000	230	2.900	150	3.400	160	2.900	100
6,0	4.200	600	4.200	600	4.200	600	4.000	400	2.700	240	2.000	160	2.400	170	2.000	120
8,0	3.000	600	3.000	600	3.000	600	2.800	400	2.000	240	1.450	160	1.800	170	1.450	120
10,0	2.500	600	2.500	600	2.500	600	2.350	400	1.600	240	1.200	160	1.450	170	1.200	120
12,0	2.100	600	2.100	600	2.100	600	2.000	400	1.350	240	1.000	160	1.200	170	1.000	120
16,0	1.500	500	1.500	500	1.500	500	1.450	320	1.000	210	750	130	900	140	750	90
20,0	1.200	460	1.200	460	1.200	460	1.150	290	800	200	600	110	700	120	600	75
Groove finishing ap	1,5 DC															
Groove finishing ae	–0,02 DC															

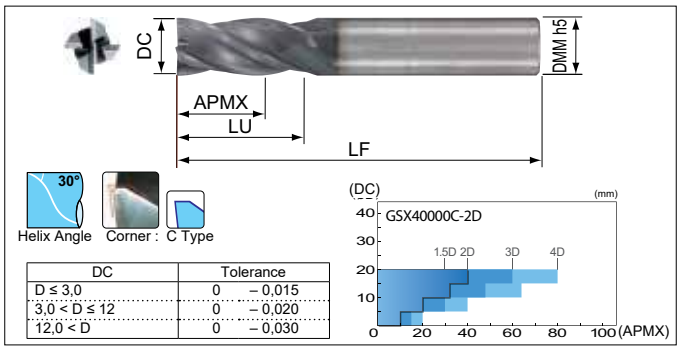
● = Euro stock
❍ = Japan stock

GSX MILL Endmills

GSX 40000C-2D Type

Coated Carbide — Grades
GSX — Coating

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

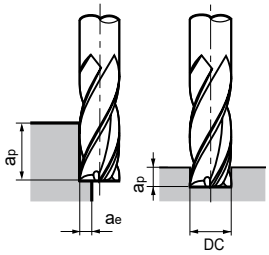
Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 40100C-2D	●	1,0	2,0	3,0	40	4
GSX 40150C-2D	●	1,5	3,0	4,0	40	4
GSX 40200C-2D	●	2,0	4,0	5,0	40	4
GSX 40250C-2D	●	2,5	5,0	6,0	40	4
GSX 40300C-2D	●	3,0	6,0	7,5	45	6
GSX 40350C-2D	❍	3,5	7,0	8,5	45	6
GSX 40400C-2D	●	4,0	8,0	9,5	45	6
GSX 40450C-2D	●	4,5	9,0	10,5	50	6
GSX 40500C-2D	●	5,0	10,0	12,0	50	6
GSX 40550C-2D	●	5,5	11,0	13,0	50	6
GSX 40600C-2D	●	6,0	12,0	–	50	6
GSX 40700C-2D	●	7,0	14,0	16,0	60	8
GSX 40800C-2D	●	8,0	16,0	–	60	8
GSX 40900C-2D	●	9,0	18,0	20,0	70	10
GSX 41000C-2D	●	10,0	20,0	–	70	10
GSX 41200C-2D	●	12,0	24,0	–	75	12
GSX 41400C-2D	❍	14,0	28,0	31,5	90	16
GSX 41500C-2D		15,0	30,0	33,5	90	16
GSX 41600C-2D	●	16,0	32,0	–	90	16
GSX 42000C-2D	●	20,0	40,0	–	100	20

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
5. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	24.000	470	24.000	470	24.000	470	21.000	290	14.500	180	10.500	120	12.600	120	10.500	85
2,0	12.800	570	12.800	570	12.800	570	12.000	380	8.300	230	6.000	150	7.200	160	6.000	110
4,0	6.800	730	6.800	730	6.800	730	6.400	490	4.400	300	3.200	200	3.800	210	3.200	130
6,0	4.600	780	4.600	780	4.600	780	4.300	520	3.000	320	2.200	210	2.650	220	2.200	150
8,0	3.400	780	3.400	780	3.400	780	3.200	520	2.200	320	1.600	210	2.000	220	1.600	150
10,0	2.800	780	2.800	780	2.800	780	2.600	520	1.800	320	1.300	210	1.500	220	1.300	150
12,0	2.300	780	2.300	780	2.300	780	2.200	520	1.500	320	1.100	210	1.300	220	1.100	150
16,0	1.700	650	1.700	650	1.700	650	1.600	420	1.100	280	800	170	1.000	180	800	120
20,0	1.350	600	1.350	600	1.350	600	1.300	380	900	260	650	150	800	160	650	100
Shoulder cutting ap	1,5 DC										1,0 DC					
Shoulder cutting ae	0,05 DC										0,02 DC					

● Shoulder Milling (High Speed Machining Centre)

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	60.000	1.200	60.000	1.200	60.000	1.200	60.000	850	60.000	720	48.000	500	32.000	300	–	–
2,0	47.800	2.200	47.800	2.200	47.800	2.200	47.800	1.600	39.800	1.200	31.800	900	15.900	400	–	–
4,0	23.900	2.600	23.900	2.600	23.900	2.600	23.900	1.900	19.900	1.400	15.900	1.100	8.000	490	–	–
6,0	16.000	2.700	16.000	2.700	16.000	2.700	16.000	2.000	13.300	1.500	10.600	1.200	5.300	520	–	–
8,0	12.000	2.700	12.000	2.700	12.000	2.700	12.000	2.000	10.000	1.500	8.000	1.200	4.000	520	–	–
10,0	9.600	2.700	9.600	2.700	9.600	2.700	9.600	2.000	8.000	1.500	6.400	1.200	3.200	520	–	–
12,0	8.000	2.700	8.000	2.700	8.000	2.700	8.000	2.000	6.700	1.500	5.300	1.200	2.700	520	–	–
16,0	6.000	2.200	6.000	2.200	6.000	2.200	6.000	1.600	5.000	1.200	4.000	900	2.000	450	–	–
20,0	4.800	2.000	4.800	2.000	4.800	2.000	4.800	1.400	4.000	1.100	3.200	750	1.600	380	–	–
Shoulder cutting ap	1,5 DC										1,0 DC					
Shoulder cutting ae	0,05 DC										0,02 DC					

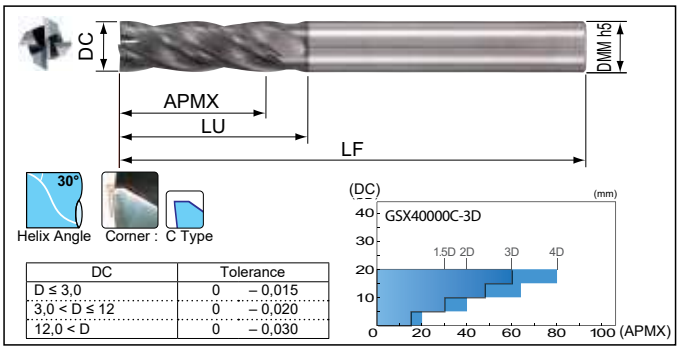
● Grooving

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	24.000	380	24.000	470	24.000	470	21.000	290	14.500	180	10.500	120	12.600	85	5.200	30
2,0	12.800	460	12.800	570	12.800	570	12.000	380	8.300	230	6.000	150	7.200	110	3.000	40
4,0	6.800	580	6.800	730	6.800	730	5.400	490	4.400	300	3.200	200	3.800	130	1.600	55
6,0	4.600	620	4.600	780	4.600	780	4.300	520	3.000	320	2.200	210	2.650	160	1.100	65
8,0	3.400	620	3.400	780	3.400	780	3.200	520	2.200	320	1.600	210	2.000	160	800	65
10,0	2.800	620	2.800	780	2.800	780	2.600	520	1.800	320	1.300	210	1.600	160	650	65
12,0	2.300	620	2.300	780	2.300	780	2.200	520	1.500	320	1.100	210	1.300	160	550	65
16,0	1.700	520	1.700	560	1.700	560	1.600	420	1.100	280	800	170	1.000	130	400	55
20,0	1.350	480	1.350	600	1.350	600	1.300	380	900	260	650	150	800	110	320	50
Grooving ap	0,2 DC		0,5 DC						0,2 DC		0,05 DC		0,2 DC			

GSX 40000C-3D Type

Coated Carbide — Grades
GSX — Coating

Structural Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 40100C-3D	❍	1,0	3,0	4,0	40	4
GSX 40150C-3D	●	1,5	4,5	5,5	40	4
GSX 40200C-3D	●	2,0	6,0	7,0	40	4
GSX 40250C-3D	❍	2,5	7,5	8,5	40	4
GSX 40300C-3D	●	3,0	9,0	10,5	50	6
GSX 40400C-3D	●	4,0	12,0	13,5	50	6
GSX 40500C-3D	●	5,0	15,0	17,0	50	6
GSX 40600C-3D	●	6,0	18,0	–	50	6
GSX 40800C-3D	●	8,0	24,0	–	70	8
GSX 41000C-3D	●	10,0	30,0	–	90	10
GSX 41200C-3D	●	12,0	36,0	–	90	12
GSX 41600C-3D	●	16,0	48,0	–	110	16
GSX 42000C-3D	❍	20,0	60,0	–	120	20

■ Endmill Identification (GSX MILL Series)

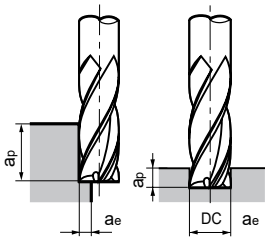
GSX 4 0100 C - 2D / 3D

Series Code	No. of Teeth	Diameter	Cutting Edge	Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rear cases, chattering may occur in early milling stages, dissipating after 2 m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	21.000	360	21.000	360	21.000	360	19.000	220	13.000	140	9.000	90	10.500	90	9.000	65
2,0	10.500	360	10.500	360	10.500	360	9.600	290	7.500	180	4.500	110	5.200	120	4.500	85
4,0	5.200	500	5.200	500	5.200	500	4.800	370	4.000	280	2.250	150	2.600	160	2.250	100
6,0	3.500	560	3.500	560	3.500	560	3.200	400	2.700	300	1.500	160	1.700	170	1.500	120
8,0	2.600	520	2.600	520	2.600	520	2.400	400	2.000	300	1.100	160	1.300	170	1.100	120
10,0	2.100	500	2.100	500	2.100	500	1.900	400	1.600	300	900	160	1.000	160	900	120
12,0	1.750	500	1.750	500	1.750	500	1.600	400	1.350	300	750	150	850	160	750	120
16,0	1.300	420	1.300	420	1.300	420	1.200	330	1.000	260	550	120	650	140	550	100
20,0	1.050	380	1.050	380	1.050	380	950	290	800	230	450	110	500	120	450	90
Shoulder cutting a_p	2,5 DC										2,0 DC					
Shoulder cutting a_e	< ø3: 0,05 DC , ≤ ø3< ø8: 0,1 DC , ≤ ø8: 0,15 DC								0,02 DC							

● Grooving

Work Material / Cond. / DC (mm)	Structural Steel		Carbon Steel (150 to 250HB)		Cast Iron		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (35 to 45HRC)		Hardened Steel (45 to 55HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
1,0	16.600	140	16.600	140	16.600	140	15.500	100	10.500	100	7.500	70	9.400	60	3.750	20
2,0	9.500	160	9.500	160	9.500	160	9.000	180	6.200	120	4.500	90	5.200	80	2.250	30
4,0	5.200	160	5.200	180	5.200	180	4.800	160	3.400	110	2.200	65	2.600	70	1.250	25
6,0	3.500	160	3.500	200	3.500	200	3.200	160	2.550	120	1.500	65	1.700	70	950	25
8,0	2.600	160	2.600	200	2.600	200	2.400	160	1.900	120	1.100	65	1.300	70	700	25
10,0	2.100	160	2.100	200	2.100	200	1.900	160	1.500	120	900	65	1.000	70	550	25
12,0	1.750	160	1.750	200	1.750	200	1.600	160	1.250	120	750	65	850	70	450	25
16,0	1.300	160	1.300	200	1.300	200	1.200	160	950	120	550	65	650	70	350	25
20,0	1.050	160	1.050	200	1.050	200	950	160	750	120	450	65	500	70	280	25
Grooving a_p	0,1 DC		0,2 DC								0,05 DC		0,1 DC			

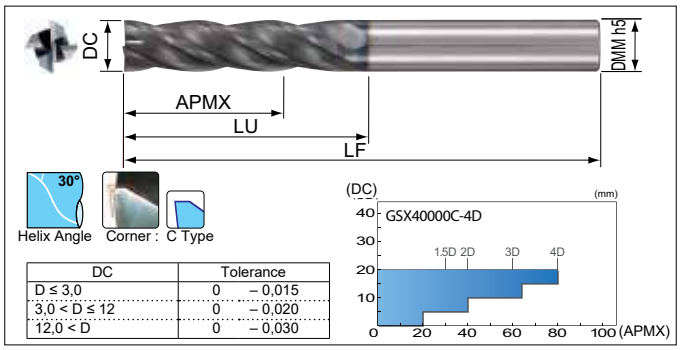
● = Euro stock
❍ = Japan stock

GSX MILL Endmills

GSX 40000C-4D Type

Coated Carbide — Grades
GSX — Coating

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			



DC	Tolerance
D ≤ 3,0	0 – 0,015
3,0 < D ≤ 12	0 – 0,020
12,0 < D	0 – 0,030

Grade: ACF20

Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSX 40100C-4D	●	1,0	4,0	5,0	40	4
GSX 40150C-4D	●	1,5	6,0	7,0	40	4
GSX 40200C-4D	●	2,0	8,0	9,0	40	4
GSX 40250C-4D	●	2,5	10,0	11,0	50	4
GSX 40300C-4D	●	3,0	12,0	13,5	50	6
GSX 40400C-4D	●	4,0	16,0	17,5	50	6
GSX 40500C-4D	●	5,0	20,0	22,0	60	6
GSX 40600C-4D	●	6,0	24,0	–	60	6
GSX 40800C-4D	●	8,0	32,0	–	80	8
GSX 41000C-4D	●	10,0	40,0	–	90	10
GSX 41200C-4D	●	12,0	48,0	–	100	12
GSX 41600C-4D	●	16,0	64,0	–	120	16
GSX 42000C-4D	❍	20,0	80,0	–	140	20

Endmill Identification (GSX MILL Series)

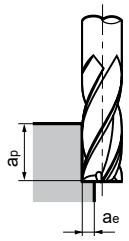
GSX 4 0100 C - 4D

GSX	4	0100	C	-	4D
Series Code	No. of Teeth	Diameter	Cutting Edge		Cutting Edge Length

S: Sharp Edge
C: Gash Land Drilling

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. In rear cases, chattering may occur in early milling stages, dissipating after 2m of cutting.
5. If chattering is a problem, reduce the spindle speed and feed rate indicated in the table below by the same ratio, or reduce the depth of cut.
6. This series is not recommended for grooving.
7. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



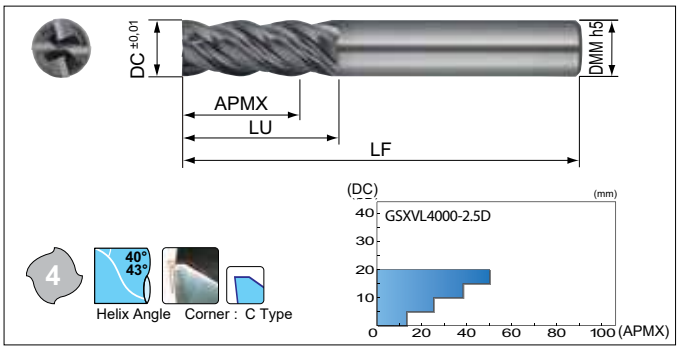
Shoulder Milling

Work Material / Cond. / DC (mm)	Structural Steel Spindle Speed (rpm)	Structural Steel Feed Rate (mm/min)	Carbon Steel (150 to 250HB) Spindle Speed (rpm)	Carbon Steel Feed Rate (mm/min)	Cast Iron Spindle Speed (rpm)	Cast Iron Feed Rate (mm/min)	Alloy Steel (25 to 35HRC) Spindle Speed (rpm)	Alloy Steel Feed Rate (mm/min)	Tempered Steel, Hardened Steel (35 to 45HRC) Spindle Speed (rpm)	Tempered Steel Feed Rate (mm/min)	Hardened Steel (45 to 55HRC) Spindle Speed (rpm)	Hardened Steel Feed Rate (mm/min)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Heat Resistive Steel, Titanium Alloy Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
1,0	9.000	140	9.000	140	9.000	140	7.000	80	6.500	60	4.500	40	5.400	40	4.500	40
2,0	4.500	140	4.500	140	4.500	140	3.500	100	3.200	80	2.300	55	2.700	55	2.300	40
4,0	2.250	200	2.250	200	2.250	200	1.750	120	1.600	100	1.200	60	1.350	50	1.200	35
6,0	1.500	250	1.500	250	1.500	250	1.150	160	1.050	140	800	65	900	45	800	35
8,0	1.100	220	1.100	220	1.100	220	850	160	800	130	600	65	660	45	600	35
10,0	900	210	900	210	900	210	700	140	650	120	460	65	540	45	460	35
12,0	750	200	750	200	750	200	580	140	520	110	400	65	450	45	400	35
16,0	550	170	550	170	550	170	440	120	400	95	300	55	330	45	300	35
20,0	450	150	450	150	450	150	350	100	320	80	240	50	270	45	240	35
Shoulder cutting a_p	3,5 DC										3,0 DC					
Shoulder cutting a_e	< ø3: 0,04 DC , 3 ≤ øD< 8: 0,08 DC , 8 ≤ øD: 0,1 DC										0,02 DC					

GSXVL 4000-2.5D Type

Coated Carbide — Grades
GSX — Coating

Structial Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
○	◎	◎	◎	◎	◎	○		◎	○	○			



Grade: ACF20

Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSXVL 4020-2.5D	●	2,0	5	6,5	50	4
GSXVL 4030-2.5D	●	3,0	8	9,5	50	6
GSXVL 4040-2.5D	●	4,0	10	11,5	50	6
GSXVL 4050-2.5D	●	5,0	13	14,5	60	6
GSXVL 4060-2.5D	●	6,0	15	–	60	6
GSXVL 4070-2.5D	❍	7,0	18	20,0	70	8
GSXVL 4080-2.5D	●	8,0	20	–	80	8
GSXVL 4090-2.5D	●	9,0	23	25,0	90	10
GSXVL 4100-2.5D	●	10,0	25	–	90	10
GSXVL 4110-2.5D	●	11,0	28	30,5	90	12
GSXVL 4120-2.5D	●	12,0	30	–	90	12
GSXVL 4140-2.5D	●	14,0	35	37,5	110	16
GSXVL 4150-2.5D	●	15,0	38	41,0	110	16
GSXVL 4160-2.5D	●	16,0	40	–	115	16
GSXVL 4180-2.5D	●	18,0	45	48,0	120	20
GSXVL 4200-2.5D	●	20,0	50	–	125	20
GSXVL 4250-2.5D	❍	25,0	63	–	140	25

SAFE-LOCK™ Applicable Endmills

Endmills

(mm)

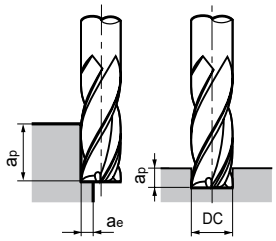
Cat. No.	Stock	DC	APMX	LU	LF	DMM
GSXVL 4120S-2.5D	❍	12,0	30	–	90	12
GSXVL 4140S-2.5D	❍	14,0	35	37,5	110	16
GSXVL 4150S-2.5D	❍	15,0	38	41,0	110	16
GSXVL 4160S-2.5D	❍	16,0	40	–	115	16
GSXVL 4180S-2.5D	❍	18,0	45	48,0	120	20
GSXVL 4200S-2.5D		20,0	50	–	125	20
GSXVL 4250S-2.5D	❍	25,0	63	–	140	25

Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.

● Shoulder Milling

Work Material / Cond. / DC (mm)	Carbon Steel, Cast Iron (150 to 250HB)		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (40 to 50HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy (20 to 45HRC)	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
2,0	13.000	1.000	10.000	800	8.000	700	10.000	580	5.000	200
4,0	9.600	1.200	8.000	1.000	6.000	800	5.500	650	3.000	230
6,0	6.800	1.500	5.600	1.200	4.200	900	3.800	680	2.100	240
8,0	5.200	1.600	4.400	1.300	3.200	950	2.800	650	1.600	250
10,0	4.200	1.500	3.500	1.200	2.600	800	2.300	600	1.300	210
12,0	3.500	1.400	3.000	1.200	2.200	700	1.900	550	1.100	180
14,0	3.000	1.200	2.600	1.100	1.800	600	1.600	500	900	150
16,0	2.700	1.100	2.200	1.000	1.600	600	1.400	480	760	130
18,0	2.400	1.000	2.000	900	1.400	570	1.300	450	680	120
20,0	2.200	900	1.700	800	1.200	550	1.100	400	600	100
25,0	1.700	680	1.400	630	1.000	450	890	310	480	82
Shoulder cutting ap	1,5 DC									
Shoulder cutting ae	0,1 DC				0,05 DC		0,1 DC		0,05 DC	



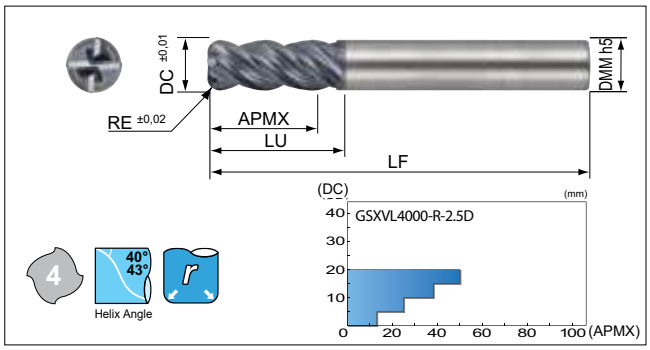
● Shoulder Milling

Work Material / Cond. / DC (mm)	Carbon Steel, Cast Iron (150 to 250HB)		Alloy Steel (25 to 35HRC)		Tempered Steel, Hardened Steel (40 to 50HRC)		Stainless Steel		Heat Resistive Steel, Titanium Alloy (20 to 45HRC)	
	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)	Spindle Speed (rpm)	Feed Rate (mm/min)
2,0	13.000	750	10.000	550	8.400	500	6.500	300	4.000	140
4,0	8.200	800	6.000	600	5.200	500	4.000	330	2.000	130
6,0	6.100	1.100	4.000	600	3.500	580	2.700	350	1.350	150
8,0	4.600	1.000	3.000	580	2.600	570	2.000	330	1.000	140
10,0	3.600	1.000	2.400	550	2.100	510	1.600	200	800	130
12,0	3.100	920	2.000	500	1.700	450	1.300	280	660	110
14,0	2.600	750	1.700	450	1.500	400	1.100	250	570	100
16,0	2.300	670	1.500	420	1.300	350	1.000	230	500	90
18,0	2.000	620	1.300	380	1.100	330	900	200	430	80
20,0	1.900	600	1.200	360	1.000	320	800	180	380	70
25,0	1.500	470	1.000	300	790	250	640	140	300	55
Grooving ap	1,0 DC				0,2 DC		0,3 DC		0,2 DC	

● = Euro stock
❍ = Japan stock
❑ = Delivery on request

Anti-Vibration MILL with R. Corner
GSXVL 4000-R-2.5D Type

Coated Carbide Grades	GSX Coating	Structial Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
		○	◎	◎	◎	◎	◎	○		◎	○	○			



Endmills

SAFE-λOCK™

Applicable Endmills

■ Endmills

(mm)

Cat. No.	Stock	DC	RE	APMX	LU	LF	DMM
GSXVL 4030-R02-2.5D	●	3,0	0,2	8	9,5	50	6
GSXVL 4030-R05-2.5D	●	3,0	0,5	8	9,5	50	6
GSXVL 4040-R02-2.5D	❍	4,0	0,2	10	11,5	50	6
GSXVL 4040-R05-2.5D	●	4,0	0,5	10	11,5	50	6
GSXVL 4040-R10-2.5D	❍	4,0	1,0	10	11,5	50	6
GSXVL 4050-R02-2.5D	●	5,0	0,2	13	14,5	60	6
GSXVL 4050-R05-2.5D	●	5,0	0,5	13	14,5	60	6
GSXVL 4050-R10-2.5D		5,0	1,0	13	14,5	60	6
GSXVL 4060-R03-2.5D	❍	6,0	0,3	15	–	60	6
GSXVL 4060-R05-2.5D	●	6,0	0,5	15	–	60	6
GSXVL 4060-R10-2.5D	●	6,0	1,0	15	–	60	6
GSXVL 4060-R15-2.5D	❍	6,0	1,5	15	–	60	6
GSXVL 4080-R03-2.5D	●	8,0	0,3	20	–	80	8
GSXVL 4080-R05-2.5D	●	8,0	0,5	20	–	80	8
GSXVL 4080-R10-2.5D	●	8,0	1,0	20	–	80	8
GSXVL 4080-R15-2.5D	●	8,0	1,5	20	–	80	8
GSXVL 4080-R20-2.5D	❍	8,0	2,0	20	–	80	8
GSXVL 4100-R03-2.5D	●	10,0	0,3	25	–	90	10
GSXVL 4100-R05-2.5D	●	10,0	0,5	25	–	90	10
GSXVL 4100-R10-2.5D	●	10,0	1,0	25	–	90	10
GSXVL 4100-R15-2.5D		10,0	1,5	25	–	90	10
GSXVL 4100-R20-2.5D	❍	10,0	2,0	25	–	90	10
GSXVL 4120-R05-2.5D	●	12,0	0,5	30	–	90	12
GSXVL 4120-R10-2.5D	●	12,0	1,0	30	–	90	12
GSXVL 4120-R15-2.5D	●	12,0	1,5	30	–	90	12
GSXVL 4120-R20-2.5D	❍	12,0	2,0	30	–	90	12
GSXVL 4120-R30-2.5D	❍	12,0	3,0	30	–	90	12
GSXVL 4160-R10-2.5D	●	16,0	1,0	40	–	115	16
GSXVL 4160-R15-2.5D	●	16,0	1,5	40	–	115	16
GSXVL 4160-R20-2.5D	●	16,0	2,0	40	–	115	16
GSXVL 4160-R30-2.5D		16,0	3,0	40	–	115	16
GSXVL 4200-R10-2.5D	●	20,0	1,0	50	–	125	20
GSXVL 4200-R15-2.5D	❍	20,0	1,5	50	–	125	20
GSXVL 4200-R20-2.5D	❍	20,0	2,0	50	–	125	20
GSXVL 4200-R30-2.5D	●	20,0	3,0	50	–	125	20
GSXVL 4250-R10-2.5D	❍	25,0	1,0	63	–	140	25
GSXVL 4250-R15-2.5D	❍	25,0	1,5	63	–	140	25
GSXVL 4250-R20-2.5D	❍	25,0	2,0	63	–	140	25
GSXVL 4250-R30-2.5D	❍	25,0	3,0	63	–	140	25

Grade: ACF20

■ Endmills

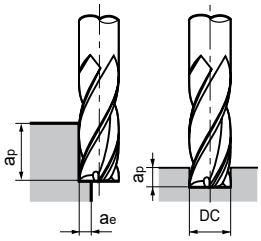
(mm)

Cat. No.	Stock	DC	RE	APMX	LU	LF	DMM
GSXVL 4120S-R05-2.5D	❍	12,0	0,5	30	–	90	12
GSXVL 4120S-R10-2.5D	❑	12,0	1,0	30	–	90	12
GSXVL 4120S-R15-2.5D	❑	12,0	1,5	30	–	90	12
GSXVL 4120S-R20-2.5D	❑	12,0	2,0	30	–	90	12
GSXVL 4120S-R30-2.5D	❑	12,0	3,0	30	–	90	12
GSXVL 4160S-R10-2.5D	❑	16,0	1,0	40	–	115	16
GSXVL 4160S-R15-2.5D	❑	16,0	1,5	40	–	115	16
GSXVL 4160S-R20-2.5D	❑	16,0	2,0	40	–	115	16
GSXVL 4160S-R30-2.5D	❑	16,0	3,0	40	–	115	16
GSXVL 4200S-R10-2.5D	❑	20,0	1,0	50	–	125	20
GSXVL 4200S-R15-2.5D	❑	20,0	1,5	50	–	125	20
GSXVL 4200S-R20-2.5D	❑	20,0	2,0	50	–	125	20
GSXVL 4200S-R30-2.5D	❑	20,0	3,0	50	–	125	20
GSXVL 4250S-R10-2.5D	❑	25,0	1,0	63	–	140	25
GSXVL 4250S-R15-2.5D	❑	25,0	1,5	63	–	140	25
GSXVL 4250S-R20-2.5D	❑	25,0	2,0	63	–	140	25
GSXVL 4250S-R30-2.5D	❍	25,0	3,0	63	–	140	25

Grade: ACF20

■ Recommended Cutting Conditions

1. For stable machining performance use rigid, high-precision machines and holders.
2. Use air blowing when dry machining.
3. Use wet machining for stainless steel, heat resistant alloy, and titanium alloy applications.
4. If the machine cannot achieve the recommended spindle speed, please use the max. spindle speed available.



● Shoulder Milling and Grooving

Work Material / Cond. / DC (mm)		Carbon Steel, Cast Iron (150 to 250HB) Spindle Speed (rpm)	Carbon Steel Feed Rate (mm/min)	Alloy Steel (25 to 35HRC) Spindle Speed (rpm)	Alloy Steel Feed Rate (mm/min)	Tempered Steel, Hardened Steel (40 to 50HRC) Spindle Speed (rpm)	Tempered Steel Feed Rate (mm/min)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Heat Resistive Steel, Titanium Alloy (20 to 45HRC) Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
2,0		9.000	720	6.000	430	4.000	320	5.500	320	2.600	120
4,0		6.600	800	4.500	450	3.000	380	4.000	320	2.000	120
6,0		4.800	960	3.000	480	2.500	380	3.000	480	1.200	120
8,0		3.600	1.000	2.200	610	2.000	400	2.000	520	1.000	140
10,0		2.800	1.000	1.800	610	1.500	400	1.700	550	800	160
12,0		2.400	950	1.500	550	1.200	380	1.500	500	700	140
14,0		2.200	880	1.300	490	1.000	360	1.200	430	600	130
16,0		1.800	650	1.100	420	800	300	1.000	360	500	120
18,0		1.600	580	1.000	360	750	270	900	340	450	110
20,0		1.400	500	900	330	700	250	820	300	400	100
Shoulder cutting	ap	1,5 DC									
	ae	0,1 DC				0,05 DC		0,1 DC		0,05 DC	
Grooving	ap	1,0 DC				0,2 DC		0,3 DC		0,2 DC	

■ Corner Radius Selection

DC	RE0,2	RE0,3	RE0,5	RE1,0	RE1,5	RE2,0	RE3,0
3	❑		❑				
4	❑		❑	❑			
5	❑		❑	❑			
6		❑	❑	❑	❑		
8		❑	❑	❑	❑	❑	
10		❑	❑	❑	❑	❑	
12			❑	❑	❑	❑	❑
16				❑	❑	❑	❑
20				❑	❑	❑	❑
25				❑	❑	❑	❑

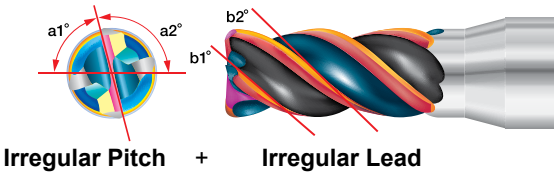
EPMS Series

New

Features

- Solid endmill EPMS-Series (**E**x **P**ress **M**ill S) for high-performance milling applications
- Higher efficiency and tool life due to new technology of latest developed carbide substrate and coating combined with the new optimized tool design
- Available with 4/5/6 flutes, different diameters and edge radii
- Excellent performance in machining of exotic alloys like Ti-alloys, super alloys and heat resistant steels
- Suitable for Titanium structure parts for airplane
- Anti-vibration design for reliable and efficient machining in a wide application range

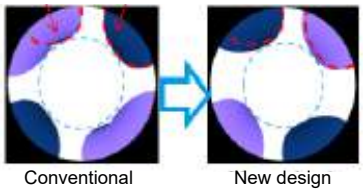
Anti-Vibration Design



Reduce the vibration dramatically, especially for poor clamping and thin wall geometry, increase the parts accuracy and tool life for customers

Optimized Flute Geometry

Effect range of chip evacuation

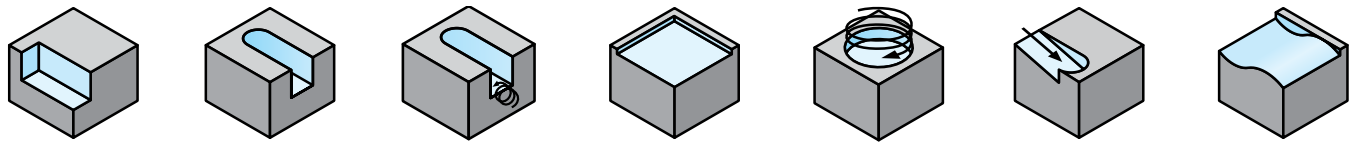


Smooth chip evacuation is realized to ensure stable and safe milling process for customers.

Comparison with other Milling Cutters

Description	Coating	Diameter	Peripheral Rake	Peripheral Relief	Helix Angle	Core Diameter	No. Edge	Radius Tolerance
GSXVL4000-R	GXS (TiAlCrN)	1–25	3–5	16	40/43	0,6D	4	-0,01/0,01
SSEHVL4000-R	GS Hard (TiAlCrSiCN)	4,5–25	5–7	17	42/45	0,65D	5	-0,01/0,01
EPMS4000-R	TiAlSiN	10–26	5–7	14	42/45	0,7D	6	-0,01/0,01

Suitable Applications

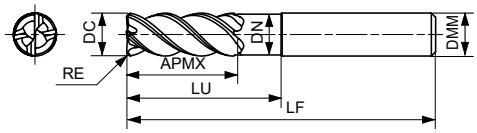


Side Milling | Slotting | Trochoidal Milling | Face Milling | Helical Milling | Ramping | Profiling

Body

EPMS 4000 Type

4 Flutes | Corner r | 42° 45° Helix Angle

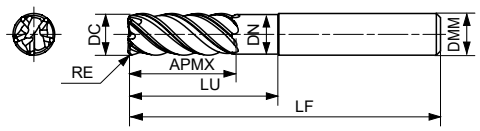


Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 4100U2.5R10	●	10	1,0	25	32	9,5	72	10
4100U2.5R30	●	10	3,0	25	32	9,5	72	10
EPMS 4120U2.5R10	●	12	1,0	30	38	11,5	83	12
4120U2.5R30	●	12	3,0	30	38	11,5	83	12
4120U2.5R40	●	12	4,0	30	38	11,5	83	12
EPMS 4160U2.5R30	●	16	3,0	40	50	15,5	100	16
4160U2.5R40	●	16	4,0	40	50	15,5	100	16

Grade: ECS300

EPMS 5000 Type

5 Flutes | Corner r | 43° 45° Helix Angle

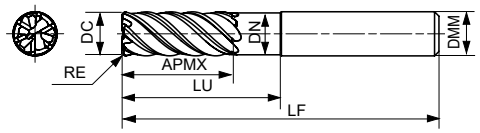


Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 5100U2.5R025	●	10	0,25	25	32	9,5	72	10
5100U2.5R15	●	10	1,5	25	32	9,5	72	10
5100U2.5R25	●	10	2,5	25	32	9,5	72	10
EPMS 5120U2.5R025	●	12	0,25	30	38	11,5	83	12
5120U2.5R05	●	12	0,5	30	38	11,5	83	12
5120U2.5R15	●	12	1,5	30	38	11,5	83	12
5120U2.5R20	●	12	2,0	30	38	11,5	83	12
5120U2.5R25	●	12	2,5	30	38	11,5	83	12
EPMS 5160U2.5R30	●	16	3,0	40	50	15,5	100	16
5160U2.5R40	●	16	4,0	40	50	15,5	100	16
EPMS 5200U2.5R30	●	20	3,0	50	62	19,5	125	20
5200U2.5R40	●	20	4,0	50	62	19,5	125	20

Grade: ECS300

EPMS 6000 Type

6 Flutes | Corner r | 43° 45° Helix Angle



Cat. No.	Stock	DC	RE	APMX	LU	DN	LF	DMM
EPMS 6100U2.5R10	●	10	1,0	25	32	9,5	72	10
6100U2.5R30	●	10	3,0	25	32	9,5	72	10
EPMS 6120U2.5R10	●	12	1,0	30	38	11,5	83	12
6120U2.5R30	●	12	3,0	30	38	11,5	83	12
6120U2.5R40	●	12	4,0	30	38	11,5	83	12
EPMS 6160U2.5R15	●	16	1,5	40	50	15,5	100	16
6160U2.5R30	●	16	3,0	40	50	15,5	100	16
6160U2.5R40	●	16	4,0	40	50	15,5	100	16
EPMS 6200U2.5R30	●	20	3,0	50	62	19,5	125	20
6200U2.5R40	●	20	4,0	50	62	19,5	125	20

Grade: ECS300

Cutting Conditions

Side Milling

Work Material	Titanum Alloy, Stainless Steel			
Cond. / DC (mm)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)		
		EPMS4000	EPMS5000	EPMS6000
10,0	3.200	1.280	1.920	3.840
12,0	2.700	1.080	1.620	3.240
16,0	2.000	800	1.200	2.400
20,0	1.600	640	960	1.920
a_e (mm), **Standard**–Max.		**0,2**–0,4 DC	**0,1**–0,3 DC	**0,06**–0,1 DC
a_p (mm), **Standard**–Max.		**2,0**–2,5 DC		

Work Material	Heat-resistant Alloy			
Cond. / DC (mm)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)		
		EPMS4000	EPMS5000	EPMS6000
10,0	1.600	380	640	960
12,0	1.300	310	520	780
16,0	1.000	240	400	600
20,0	800	190	320	480
a_e (mm), **Standard**–Max.		**0,2**–0,4 DC	**0,1**–0,3 DC	**0,06**–0,1 DC
a_p (mm), **Standard**–Max.		**2,0**–2,5 DC		

Slotting

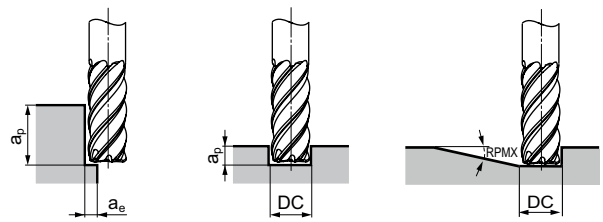
Work Material	Titanum Alloy, Stainless Steel			
Cond. / DC (mm)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)		
		EPMS4000	EPMS5000	EPMS6000
10,0	1.900	460	570	Not recom-mended
12,0	1.600	380	480	
16,0	1.200	290	360	
20,0	960	230	290	
a_p (mm), **Standard**–Max.		**1,0**–1,5 DC	**0,5**–1,0 DC	

Work Material	Heat-resistant Alloy			
Cond. / DC (mm)	Spindle Speed (min⁻¹)	Feed Rate (mm/min)		
		EPMS4000	EPMS5000	EPMS6000
10,0	960	230	290	Not recom-mended
12,0	800	190	240	
16,0	600	140	180	
20,0	480	120	140	
a_p (mm), **Standard**–Max.		**0,3**–0,5 DC	**0,2**–0,4 DC	

Ramping / Helical Milling

Body Type	EPMS4000	EPMS5000	EPMS6000
RPMX, **Standard**–Max.		**2,0°**–3,0°	

Side Milling | Slotting | Ramping

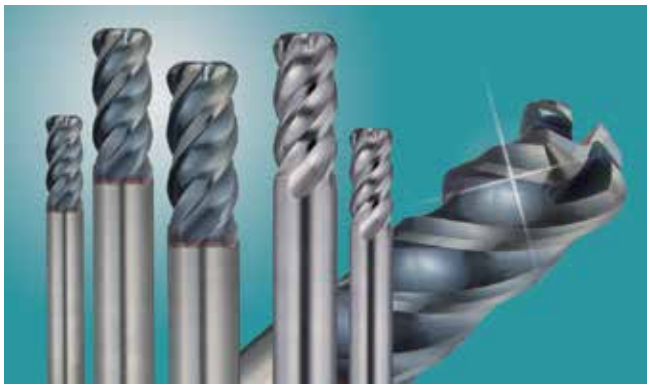


Identification Details

EPMS	4	100	U2.5		R10	CS300
Series Code	Number of Teeth	Diameter	Neck Type U: Under Neck S: Straight+LxD	Other Options* W: Weldon B: Chip Breaker	Corner Radius R10: = 1 mm C: Chamfer	Grade

* On request

SSEH Series



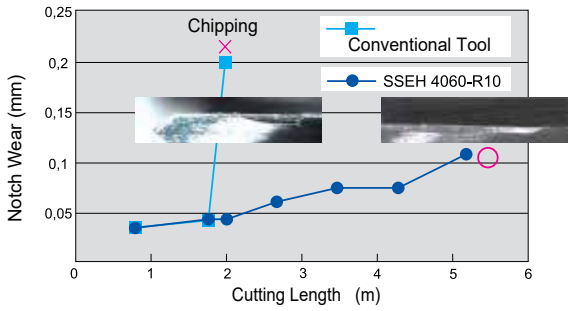
SSEH Radius

■ Characteristics and Applications

- Steep helix (45° helix) improves sharpness.
- Combination of unique flute design and semi-mirrored surface improves chip evacuation and adhesion resistance.
- Ultra-smooth coating with improved hardness and heat resistance combined with tough carbide substrate improves tool life when working with heat resistant alloys.
- Unique, smooth radius shape mitigates cutting impact and improves fracture resistance.
- Both coated and uncoated types are available in stock to meet various conditions.

■ Application Examples

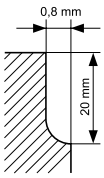
- Inconel 718 (Side Milling)



Tool Diameter: ø 6 × R1
Cutting Conditions: v_c = 20 m/min, f_z = 0,025 mm/t, a_p = 5 mm, a_e = 0,5 mm, wet

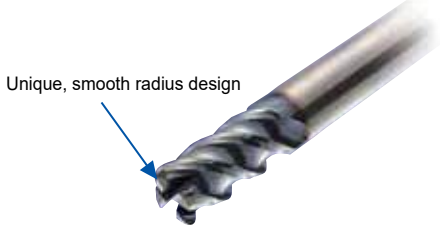
- Inconel 713 (Side Milling)

SSEH 4100W-R10	Competitor's Product



Tool Diameter : ø 10 x R1
Cutting Conditions : v_c= 32 m/min, f_z = 0,018 mm/t
a_p = 20 mm, a_e = 0,8 m, Dry

In Sumitomo Electric Hardmetal tests, the special coating with excellent adhesion resistance provided less cutting edge adhesion than the competitor's product and enabled fracturefree machining.
The competitor's product suffered from edge adhesion leading to breakage.

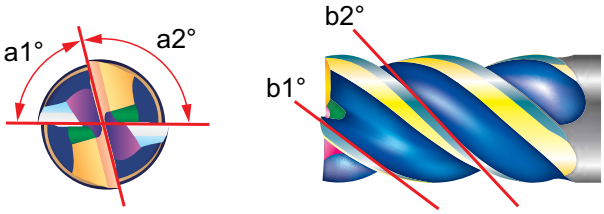


SSEH Radius Anti-vibration Type

■ Characteristics and Applications

- New anti-vibration type added to the SSEH type endmill for exotic alloys.
- Builds on the same features of existing endmills by adding an irregular lead for exceptionally good anti-vibration performance.
- Compatible with wide range of milling for exotic alloys including SUS, Inconel, and titanium.
- Reduces chattering for high-speed, high-feed cutting.
- Both coated and uncoated types are available in stock to meet various conditions.

Irregular Pitch + Irregular Lead

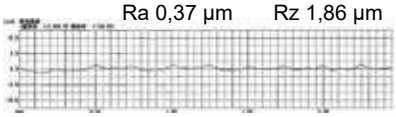


■ Application Examples

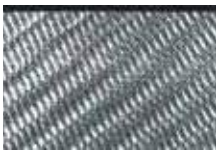
- Surface Roughness Comparison

SSEH Anti-vibration Type

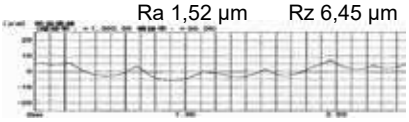
Good Surface Quality
Ra 0,37 µm Rz 1,86 µm



Conventional Tool



Surface shows chattering
Ra 1,52 µm Rz 6,45 µm



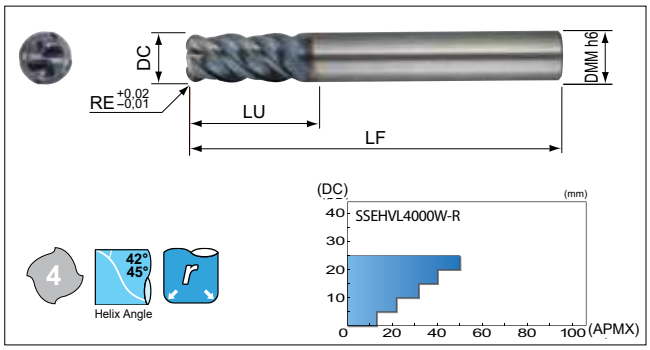
Work Material: X5CrNi1810 (Surface Milling)
Tool Diameter: ø 12 mm
Cutting Conditions: n = 1.300 rpm, v_f = 300 mm/min
a_p = 18 mm, a_e = 1,2 mm
Equipment: BT50

● = Euro stock
❍ = Japan stock
❑ = Delivery on request

Anti-Vibration MILL with R. Corner

SSEHVL 4000W-R Type

Coated Carbide Grades	GS HARD Coating	Structial Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
		○	○	○	○	○				◎	◎				



Grade: ACW52

SAFE-λOCK™

Applicable Endmills

■ Endmills

(mm)

Cat. No.	Stock	DC	RE	LU	LF	DMM
SSEHVL 4045W-R05	●	4,5	0,5	12	50	6
SSEHVL 4045W-R10	❍	4,5	1,0	12	50	6
SSEHVL 4050W-R05		5,0	0,5	13	60	6
SSEHVL 4050W-R10	●	5,0	1,0	13	60	6
SSEHVL 4060W-R10	❍	6,0	1,0	13	60	6
SSEHVL 4080W-R10	●	8,0	1,0	19	80	8
SSEHVL 4100W-R10	●	10,0	1,0	22	90	10
SSEHVL 4100W-R30	●	10,0	3,0	22	90	10
SSEHVL 4120W-R10	●	12,0	1,0	26	90	12
SSEHVL 4120W-R30	●	12,0	3,0	26	90	12
SSEHVL 4160W-R10	●	16,0	1,0	32	115	16
SSEHVL 4160W-R30	●	16,0	3,0	32	115	16
SSEHVL 4200W-R10		20,0	1,0	40	125	20
SSEHVL 4200W-R30	❍	20,0	3,0	40	125	20
SSEHVL 4250W-R10		25,0	1,0	50	140	25
SSEHVL 4250W-R30	❍	25,0	3,0	50	140	25

■ Endmills

(mm)

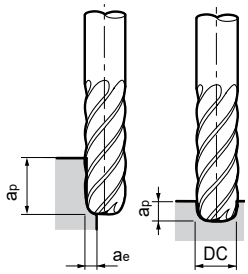
Cat. No.	Stock	DC	RE	LU	LF	DMM
SSEHVL 4120WS-R10	❑	12,0	1,0	26	90	12
SSEHVL 4120WS-R30	❑	12,0	3,0	26	90	12
SSEHVL 4160WS-R10	❑	16,0	1,0	32	115	16
SSEHVL 4160WS-R30	❑	16,0	3,0	32	115	16
SSEHVL 4200WS-R10	❑	20,0	1,0	40	125	20
SSEHVL 4200WS-R30	❑	20,0	3,0	40	125	20
SSEHVL 4250WS-R10	❑	25,0	1,0	50	140	25
SSEHVL 4250WS-R30	❑	25,0	3,0	50	140	25

■ Diameter and Corner Radius Selection Range

DC	RE0,5	RE1,0	RE3,0
4,5	●	❍	
5		●	
6		❍	
8		●	
10		●	●
12		●	●
16		●	●
20			❑
25			❑

■ Recommended Cutting Conditions

1. For stable machining, a more rigid machine is recommended.
2. Wet machining is recommended for stainless steel and heat resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Titanium Alloy Spindle Speed (rpm)	Titanium Alloy Feed Rate (mm/min)	Heat Resistive Steel Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
4,5	3.500	350	3.500	280	2.100	170
5,0	3.200	380	3.200	320	1.900	190
6,0	2.700	430	2.700	320	1.600	190
8,0	2.000	400	2.000	280	1.200	170
10,0	1.600	380	1.600	260	1.000	160
12,0	1.300	360	1.300	230	800	140
16,0	1.000	320	1.000	200	600	120
20,0	800	260	800	160	480	100
25,0	640	200	640	130	380	80
Shoulder cutting ap	1,5 DC					
Shoulder cutting ae	0,1 DC		0,05 DC		0,05 DC	

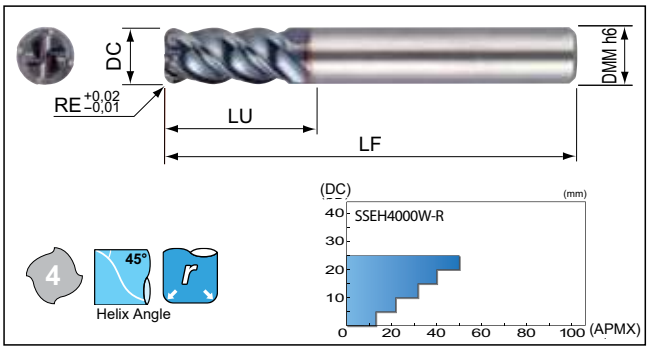
● Grooving

Work Material / Cond. / DC(mm)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Titanium Alloy Spindle Speed (rpm)	Titanium Alloy Feed Rate (mm/min)	Heat Resistive Steel Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
4,5	4,200	200	3,900	270	1,400	100
5,0	3,800	240	3,500	300	1,300	120
6,0	3,200	260	2,900	300	1,100	140
8,0	2,400	240	2,200	270	800	120
10,0	1,900	220	1,700	250	650	110
12,0	1,600	200	1,400	230	550	100
16,0	1,200	130	1,100	200	400	80
20,0	950	95	890	90	320	60
25,0	760	75	700	70	250	50
Grooving ap	0,3 DC		0,2 DC		0,15 DC	

SSEH 4000W-R Type

4 Flutes Endmills with Radius Corner and HAIMER's SAFE-LOCK™ Applicable Endmills

Coated Carbide Grades	GS HARD Coating	Stuctual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti-Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
		○	○	○	○	○				◎	◎				



Grade: ACW52

SAFE-λOCK™

Applicable Endmills

■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
SSEH 4045W-R05		4,5	0,5	12	50	6
SSEH 4050W-R05	❍	5,0	0,5	13	60	6
SSEH 4060W-R10	●	6,0	1,0	13	60	6
SSEH 4080W-R10	●	8,0	1,0	19	80	8
SSEH 4100W-R10	●	10,0	1,0	22	90	10
SSEH 4100W-R30	❍	10,0	3,0	22	90	10
SSEH 4120W-R10	●	12,0	1,0	26	90	12
SSEH 4120W-R30		12,0	3,0	26	90	12
SSEH 4160W-R10	●	16,0	1,0	32	115	16
SSEH 4160W-R30		16,0	3,0	32	115	16
SSEH 4200W-R10	❍	20,0	1,0	40	125	20
SSEH 4200W-R30	❍	20,0	3,0	40	125	20
SSEH 4250W-R10		25,0	1,0	50	140	25
SSEH 4250W-R30	❍	25,0	3,0	50	140	25

■ Endmills

(mm)

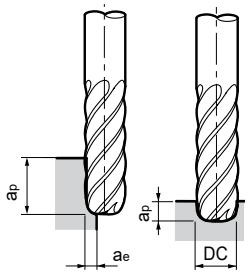
Cat. No.	Stock	DC	APMX	LU	LF	DMM
SSEH 4120WS-R10	❑	12,0	1,0	26	90	12
SSEH 4120WS-R30	❑	12,0	3,0	26	90	12
SSEH 4160WS-R10	❑	16,0	1,0	32	115	16
SSEH 4160WS-R30	❑	16,0	3,0	32	115	16
SSEH 4200WS-R10	❑	20,0	1,0	40	125	20
SSEH 4200WS-R30	❑	20,0	3,0	40	125	20
SSEH 4250WS-R10	❑	25,0	1,0	50	140	25
SSEH 4250WS-R30	❑	25,0	3,0	50	140	25

■ Diameter and Corner Radius Selection Range

DC	RE0,5	RE1,0	RE3,0
4,5			
5	❍		
6		●	
8		●	
10		●	❍
12		●	
16		●	
20		❍	❍
25			❍

■ Recommended Cutting Conditions

1. For stable machining, a more rigid machine is recommended.
2. Wet machining is recommended for stainless steel and heat resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Titanium Alloy Spindle Speed (rpm)	Titanium Alloy Feed Rate (mm/min)	Heat Resistive Steel Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
4,5	3.500	350	3.500	280	2.100	170
5,0	3.200	380	3.200	320	1.900	190
6,0	2.700	430	2.700	320	1.600	190
8,0	2.000	400	2.000	280	1.200	170
10,0	1.600	380	1.600	260	1.000	160
12,0	1.300	360	1.300	230	800	140
16,0	1.000	320	1.000	200	600	120
20,0	800	260	800	160	480	100
25,0	640	200	640	130	380	80
Shoulder cutting ap	1,5 DC					
Shoulder cutting ae	0,1 DC		0,05 DC		0,05 DC	

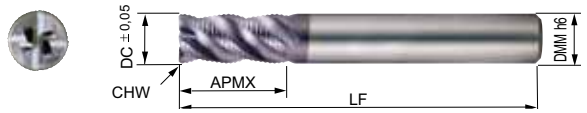
● Grooving

Work Material / Cond. / DC (mm)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Titanium Alloy Spindle Speed (rpm)	Titanium Alloy Feed Rate (mm/min)	Heat Resistive Steel Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
4,5	4,200	200	3,900	270	1,400	100
5,0	3,800	240	3,500	300	1,300	120
6,0	3,200	260	2,900	300	1,100	140
8,0	2,400	240	2,200	270	800	120
10,0	1,900	220	1,700	250	650	110
12,0	1,600	200	1,400	230	550	100
16,0	1,200	130	1,100	200	400	80
20,0	950	95	890	90	320	60
25,0	760	75	700	70	250	50
Grooving ap	0,3 DC		0,2 DC		0,15 DC	

● = Euro stock
❍ = Japan stock
❑ = Delivery on request

GS MILL Series
GSRE 4000SF Type

Coated carbide grade: **ACZ20W**



Helix angle : 40°

■ Endmills

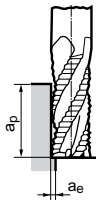
(mm)

Cat. No.	Stock	DC	APMX	LF	CHW	DMM
GSRE 4060 SF	●	6,0	13	50	0,3	6
4070 SF	●	7,0	16	60	0,3	8
4080 SF	●	8,0	19	60	0,4	8
4090 SF	●	9,0	19	70	0,4	10
4100 SF	●	10,0	22	70	0,5	10
GSRE 4110 SF	●	11,0	22	75	0,5	12
4120 SF	●	12,0	26	75	0,6	12
4140 SF	●	14,0	26	90	0,6	16
4160 SF	●	16,0	32	90	0,8	16
4180 SF	●	18,0	32	100	0,8	20
GSRE 4200 SF	●	20,0	38	100	1,0	20

Recommended :

(1) Cutting performance is improved when using a high rigidity machine.

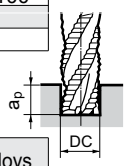
(2) Speeds and feeds should be reduced when there is any excessive vibration or strange noise during the operation.



■ Recommended Cutting Conditions

● Shoulder cutting

Tool Dia. (mm) \ Material / Cutting data	Carbon steel (HB150–250)		Cast iron		Alloy steel, Prehardened steel (HRC25–35)		Hardened steel (HRC40–50)		Stainless steel		Heat resistant alloys Titanium alloy	
	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)
1	4.800	1.200	5.800	1.500	3.200	380	2.600	400	4.300	250	1.600	90
2	4.100	1.200	5.000	1.500	2.700	380	2.200	400	4.500	250	1.350	90
3	3.600	1.200	4.500	1.500	2.400	380	2.000	400	4.000	250	1.250	90
4	3.200	1.200	4.000	1.500	2.100	380	1.800	400	3.500	250	1.050	90
5	2.800	1.200	2.500	1.500	1.900	380	1.600	400	3.200	250	1.000	100
6	2.600	1.200	3.000	1.400	1.700	380	1.500	400	2.900	250	900	100
8	2.400	1.200	2.900	1.400	1.600	400	1.300	400	2.600	250	800	100
10	2.200	1.100	2.600	1.300	1.300	380	1.100	350	2.200	200	700	100
12	1.800	900	2.200	1.100	1.200	380	1.000	350	2.000	180	600	100
16	1.400	700	1.800	900	1.000	380	900	350	1.800	150	550	100
20	1.400	700	1.700	800	850	380	800	350	1.600	150	500	100
Shoulder cutting a_p	1,5 DC						1,5 DC					
Shoulder cutting a_e	0,5 DC						0,3 DC					



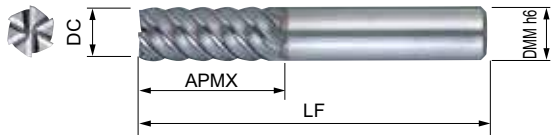
● Slotting

Tool Dia. (mm) \ Material / Cutting data	Carbon steel (HB150–250)		Cast iron		Alloy steel, Prehardened steel (HRC25–35)		Hardened steel (HRC40–50)		Stainless steel		Heat resistant alloys Titanium alloy	
	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)
1	3.600	900	4.300	1.100	2.400	300	1.700	260	4.200	250	1.100	60
2	3.000	900	3.700	1.100	2.000	280	1.500	260	3.600	250	900	60
3	2.700	900	3.400	1.100	1.800	280	1.350	260	3.200	250	800	60
4	2.400	900	3.000	1.100	1.600	280	1.200	260	2.800	250	700	60
5	2.100	900	2.600	1.100	1.400	280	1.100	270	2.500	250	650	65
6	2.000	900	2.300	1.100	1.300	280	1.000	270	2.300	250	600	70
8	1.800	900	2.200	1.100	1.200	300	900	270	2.100	250	550	70
10	1.600	800	2.000	1.100	1.000	290	750	240	1.800	180	450	65
12	1.350	650	1.650	850	900	280	700	240	1.600	160	400	65
16	1.200	550	1.500	750	800	280	600	230	1.400	140	350	60
20	1.050	500	1.350	700	700	280	550	210	1.250	125	300	60
Slotting a_p	1,0 DC						0,5 DC					

GSH 4000/6000/8000 SF Type

TiAlN Coated Fast Helix Endmills

Coated carbide grade: **ACF07C**



Helix angle : 50˚
Corner : Edge with honing

DC	Tolerance (mm)
D ≤ 3,0	0 – - 0,015
3,0 < D	0 – - 0,030

Endmills

(mm)

Cat. No.	Stock	DC	APMX	LF	DMM
GSH 4010 SF	●	1,0	3	50	6
4015 SF	●	1,5	4	50	6
4020 SF	●	2,0	6	50	6
GSH 6030 SF	●	3,0	8	50	6
6040 SF	●	4,0	11	50	6
6050 SF	●	5,0	12	50	6
6060 SF	●	6,0	13	50	6
6080 SF	●	8,0	19	60	8
6100 SF	●	10,0	22	70	10
6120 SF	●	12,0	26	75	12
GSH 8160 SF	●	16,0	32	90	16
8200 SF	●	20,0	38	100	20

Recommended :
(1) Cutting performance is improved when using a high rigidity machine.
(2) Speeds and feeds should be reduced when there is any excessive vibration or strange noise during the operation.

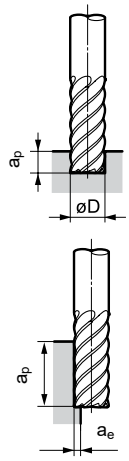
Recommended Cutting Conditions

Conventional Milling Operations

Material / Cutting data / Tool Dia. (mm)	Alloy steel, Prehardened steel (–HRC35)		Heat treated alloy steel, hardened steel (HRC35–45)		Hardened steel (HRC45–55)		Hardened steel (HRC55–60)		Hardened steel (HRC60–65)		Hardened steel (HRC65–)	
	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)
1	20.000	540	20.000	390	15.600	260	12.300	160	11.100	140	7.800	95
2	19.000	1.100	17.200	770	13.400	530	10.500	320	9.500	270	6.700	190
3	15.000	2.150	13.400	1.540	10.400	1.050	8.200	650	7.400	540	5.200	380
4	11.200	2.400	10.000	1.740	7.800	1.180	6.100	730	5.600	600	3.900	420
5	9.000	2.700	8.000	1.930	6.200	1.300	4.900	810	4.400	670	3.100	470
6	7.500	2.700	6.700	1.930	5.200	1.300	4.100	810	3.700	670	2.600	470
8	5.600	2.700	5.000	1.930	3.900	1.300	3.050	810	2.800	670	1.950	470
10	4.500	2.700	4.000	1.930	3.100	1.300	2.450	810	2.200	670	1.550	470
12	3.750	2.700	3.350	1.930	2.600	1.300	2.050	810	1.850	670	1.300	470
16	2.800	2.500	2.500	1.800	1.950	1.220	1.530	760	1.400	630	980	440
20	2.250	2.100	2.000	1.540	1.550	1.050	1.230	650	1.100	540	780	380
Shoulder cutting a_p	1–1,5 DC				1–1,5 DC				1–1,5 DC			
Shoulder cutting a_e	0,1 DC				0,05 DC				0,02 DC			
Slotting a_p	0,1 DC				0,05 DC				–0,05 DC (Max 0,5)			

HSC Machining Centre Operations

Material / Cutting data / Tool Dia. (mm)	Alloy steel, Prehardened steel (–HRC35)		Heat treated alloy steel, hardened steel (HRC35–45)		Hardened steel (HRC45–55)		Hardened steel (HRC55–60)		Hardened steel (HRC60–65)	
	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)
1	48.000	1.250	48.000	1.250	48.000	1.250	48.000	930	38.000	700
2	48.000	2.850	48.000	2.850	48.000	2.850	36.000	1.600	24.000	1.000
3	32.000	4.900	32.000	4.900	32.000	4.900	24.000	2.740	16.000	1.700
4	24.000	5.200	24.000	5.200	24.000	5.200	18.000	2.900	12.000	1.800
5	19.200	5.800	19.200	5.800	19.200	5.800	14.300	3.200	9.600	2.000
6	16.000	5.800	16.000	5.800	16.000	5.800	12.000	3.200	8.000	2.000
8	12.000	5.800	12.000	5.800	12.000	5.800	9.000	3.200	6.000	2.000
10	9.600	5.800	9.600	5.800	9.600	5.800	7.200	3.200	4.800	2.000
12	8.000	5.800	8.000	5.800	8.000	5.800	6.000	3.200	4.000	2.000
16	6.000	5.400	6.000	5.400	6.000	5.400	4.500	3.000	3.000	1.900
20	4.800	4.600	4.800	4.600	4.800	4.600	3.600	2.580	2.400	1.600
Shoulder cutting a_p	1–1,5 DC		1–1,5 DC				1–1,5 DC		1–1,5 DC	
Shoulder cutting a_e	0,1 DC		0,05 DC				0,02 DC		0,12 DC	



● = Euro stock

AURORA COAT Series

■ Features

Sumitomo Electric's "AURORA" COAT is a high hardness, low coefficient layer of "Diamond Like Carbon" (DLC).

Other than producing excellent surface finish for machining of Aluminium and non-ferrous metals, DLC coat can be used for dry cutting and is environmental friendly.

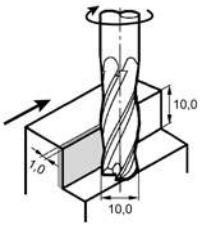
■ Characteristics / Application

- Very smooth AURORA COAT results in low adhesion as well as good surface finish
- With lower cutting forces and high rigidity, this series is suitable for low rigidity machine
- Available in 2 and 4 flutes square type as well as ballnose type endmills

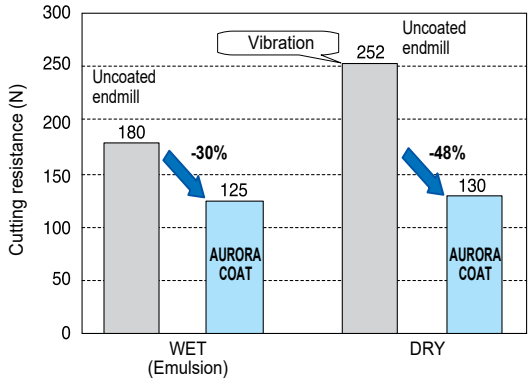
■ Product Range

Series	No. of teeth	Shape	Diameter
ASM2000DL	2	Square	ø 2 – ø 16
ASM4000DL	4	Square	ø 2 – ø 16
SNB2000DL	2	Ballnose	ø 2 – ø 16 (R1 – R8)

■ Efficiency

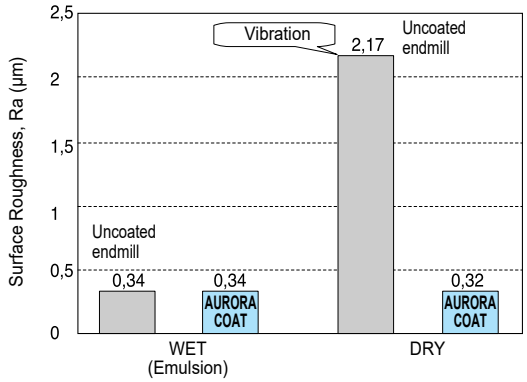


● Performance Comparison



Work Material: A5052
Tool: ASM4100DL, ø 10 mm 4 teeth
Cutting Conditions: v_c = 200 m/min, n = 6,300 rpm, v_f = 1300 mm/min
f_z = 0,05 mm/tooth, a_p = 10 mm, a_e = 1,0 mm
Down Cut

● Surface Finish Comparison

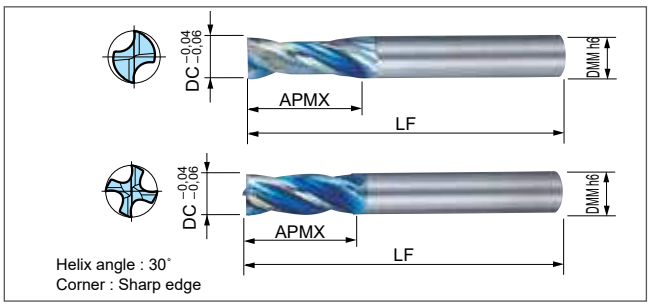


Work Material: A5052
Tool: ASM4100DL, ø 10 mm 4 teeth
Cutting Conditions: v_c = 200 m/min, n = 6,300 rpm, v_f = 1300 mm/min
f_z = 0,05 mm/tooth, a_p = 10 mm, a_e = 1,0 mm
Down Cut

AURORA Coated Spiral Endmills
ASM 2000/4000 DL Type

2 4

DLC coated carbide grade: DL1000



■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LF	DMM
ASM 2020 DL	●	2,0	6	40	4
2030 DL	●	3,0	10	45	6
2040 DL	●	4,0	12	45	6
2050 DL	●	5,0	15	50	6
ASM 2060 DL	●	6,0	15	50	6
2080 DL	●	8,0	18	60	8
2100 DL	●	10,0	22	71	10
ASM 2120 DL	●	12,0	25	75	12
2160 DL	●	16,0	32	90	16

ASM 4020 DL	●	2,0	6	40	4
4030 DL	●	3,0	10	45	6
4040 DL	●	4,0	12	45	6
4050 DL	●	5,0	15	50	6
ASM 4060 DL	●	6,0	15	50	6
4080 DL	●	8,0	18	60	8
4100 DL	●	10,0	22	71	10
ASM 4120 DL	●	12,0	25	75	12
4160 DL	●	16,0	32	90	16

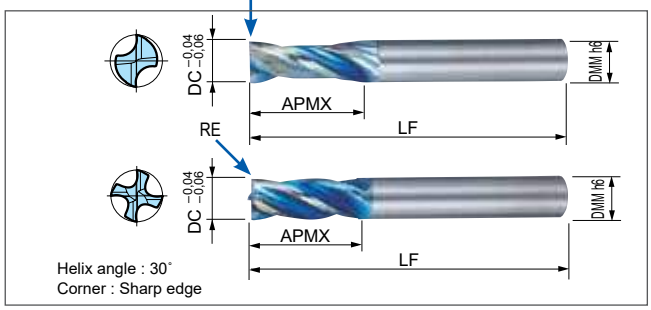
AURORA Coated Spiral Endmills
ASM 2000/4000 DL-R Type

With Radius Corner

-R

2 4

DLC coated carbide grade: DL1000

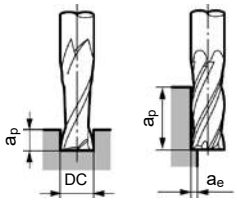


■ Endmills

(mm)

Cat. No.	Stock	DC	RE	APMX	LF	DMM
ASM 2080 DL-R10	●	8,0	1,0	18	60	8
2080 DL-R20	❑	8,0	2,0	18	60	8
ASM 2100 DL-R10	❑	10,0	1,0	22	71	10
2100 DL-R20	❑	10,0	2,0	22	71	10
ASM 2120 DL-R20	❑	12,0	2,0	25	75	12
2120 DL-R30	❑	12,0	3,0	25	75	12
ASM 2160 DL-R30	❑	16,0	3,0	32	90	16

ASM 4080 DL-R10	❑	8,0	1,0	18	60	8
4080 DL-R20	❑	8,0	2,0	18	60	8
ASM 4100 DL-R10	●	10,0	1,0	22	71	10
4100 DL-R20	❑	10,0	2,0	22	71	10
ASM 4120 DL-R20	❑	12,0	2,0	25	75	12
4120 DL-R30	❑	12,0	3,0	25	75	12
ASM 4160 DL-R30	●	16,0	3,0	32	90	16



■ Recommended Cutting Conditions

Recommended :

(1) Cutting performance is improved when using a high rigidity machine.

(2) Speeds and feeds should be reduced when there is any excessive vibration or strange noise during the operation.

(3) In case of chatter first check the cutting conditions.

Work Material	Aluminium Alloy							
Cutting data	Wet (Emulsion)				Dry			
	Side Milling (4 teeth)		Groove Milling (4 teeth)		Side Milling (4 teeth)		Groove Milling (4 teeth)	
DC (mm)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)
2,0	40.000	1.400	28.000	280	40.000	980	28.000	200
3,0	32.000	2.000	22.000	400	32.000	1.400	22.000	280
4,0	26.000	2.600	18.000	520	26.000	1.800	18.000	360
5,0	20.000	2.600	14.000	520	20.000	1.800	14.000	360
6,0	17.000	2.700	12.000	540	17.000	1.900	12.000	370
8,0	13.000	2.700	9.000	540	13.000	1.900	9.000	370
10,0	11.000	2.800	7.200	560	11.000	2.000	7.200	390
12,0	8.500	2.800	6.000	560	8.500	2.000	6.000	390
16,0	6.400	2.800	4.500	560	6.400	2.000	4.500	390
Depth and wide of cut a_p	1,5 DC		1,0 DC		1,5 DC		0,5 DC	
Depth and wide of cut a_e	0,2 DC		(DC)		0,2 DC		(DC)	

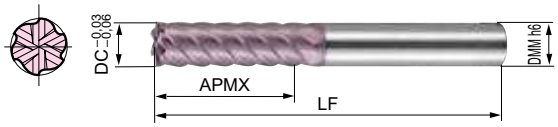
● = Euro stock
❍ = Japan stock
❑ = Delivery on request

ZX Coated Long Fast Helix Endmills
LHHM 4000/6000/8000 ZX Type

4 6 8

Coated carbide grade: ACZ10M

6 teeth



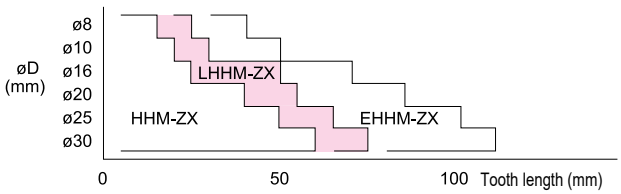
Helix angle : 45˚
Corner : Edge with honing

DC	Tolerance (mm)
D ≤ 6,0	– 0,010 – 0,030
6,0 < D ≤ 10,0	– 0,015 – 0,040
10,0 < D	– 0,020 – 0,050

■ Endmills

(mm)

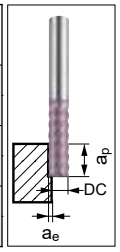
Cat. No.	Stock	DC	APMX	LF	DMM
LHHM 4030 ZX	❍	3,0	12	55	6
4040 ZX	❍	4,0	15	60	6
4050 ZX	❍	5,0	18	60	6
LHHM 6060 ZX	❍	6,0	18	60	6
6080 ZX	❍	8,0	25	75	8
6100 ZX	❍	10,0	30	80	10
6120 ZX	❍	12,0	30	100	12
LHHM 8160 ZX	❍	16,0	50	105	16
8200 ZX	❍	20,0	55	120	20
8250 ZX	❍	25,0	65	140	25
8300 ZX	❑	30,0	75	160	32



Recommended conditions

(Shoulder processing) a_p = 1,5 x øD
a_e =0,025(HRC56~65) ~ 0,2(below HRC25) x øD

DC \ Material		Carbon steel, Alloy steel (BelowHRC25)	Carbon steel, Alloy steel (BelowHRC45)	Hardened steel (BelowHRC65)	Cast iron
3,0–5,0	v_c	200–**250**–300	100–**150**–200	80–**100**–120	60–**75**–90
	f_z	0,030–0,060	0,022–0,037	0,007–0,015	0,030–0,060
6,0–12,0	v_c	200–**250**–300	100–**150**–200	80–**100**–120	40–**50**–60
	f_z	0,061–0,090	0,037–0,067	0,015–0,028	0,060–0,165
16,0–32,0	v_c	200–**250**–300	100–**150**–200	80–**100**–120	40–**50**–60
	f_z	0,090–0,098	0,067–0,075	0,028–0,038	0,187–0,262



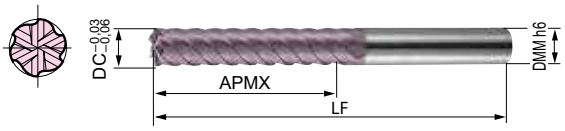
v_c = m/min f_z = mm/tooth

ZX Coated Extra Long Fast Helix Endmills
EHHM 4000/6000/8000 ZX Type

4 6 8

Coated carbide grade: ACZ10M

6 teeth



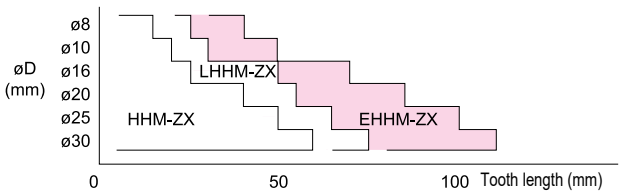
Helix angle : 45˚
Corner : Edge with honing

DC	Tolerance (mm)
D ≤ 6,0	– 0,010 – 0,030
6,0 < D ≤ 10,0	– 0,015 – 0,040
10,0 < D	– 0,020 – 0,050

■ Endmills

(mm)

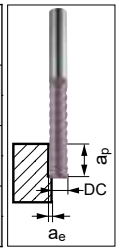
Cat. No.	Stock	DC	APMX	LF	DMM
EHHM 4030 ZX	❍	3,0	20	60	6
4040 ZX	❍	4,0	25	65	6
4050 ZX	❍	5,0	30	70	6
EHHM 6060 ZX	❍	6,0	30	70	6
6080 ZX	❍	8,0	40	90	8
6100 ZX	❍	10,0	50	100	10
6120 ZX	❍	12,0	50	120	12
EHHM 8160 ZX	❍	16,0	70	140	16
8200 ZX	❍	20,0	85	165	20
8250 ZX	❍	25,0	100	185	25
8300 ZX	❍	30,0	110	205	32
8320 ZX	❍	32,0	110	205	32



Recommended conditions

(Shoulder processing) a_p = 1,5 x øD
a_e =0,025(HRC56~65) ~ 0,2(below HRC25) x øD

DC \ Material		Carbon steel, Alloy steel (BelowHRC25)	Carbon steel, Alloy steel (BelowHRC45)	Hardened steel (BelowHRC65)	Cast iron
3,0–5,0	v_c	200–**250**–300	100–**150**–200	80–**100**–120	100–**120**–150
	f_z	0,020–0,040	0,015–0,025	0,005–0,010	0,020–0,040
6,0–12,0	v_c	200–**250**–300	100–**150**–200	80–**100**–120	100–**120**–150
	f_z	0,041–0,060	0,025–0,045	0,01 0–0,019	0,040–0,110
16,0–32,0	v_c	200–**250**–300	100–**150**–200	80–**100**–120	100–**120**–150
	f_z	0,060–0,065	0,045–0,050	0,019–0,025	0,125–0,175



v_c = m/min f_z = mm/tooth

SSUP MILL Series

■ Features

ZX coated general use endmill for high efficient slotting and side cutting of steels, stainless steels, high temperature alloys and cast irons.

Unique flute design and strong cutting edge ensure excellent chip control even when rough machining slots.

Feed rate up to 2000 mm/min with and without coolant

■ Advantages

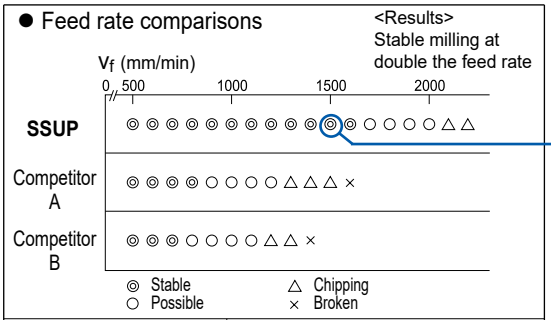
- Unique flute design for excellent chip removal
- Extra strong cutting edge
- 40° high helix angle for high feed rates
- New ZX coating for excellent wear resistance
- Smooth cutting
- Excellent rigid wide cutting land

SSUP 4000ZX-R Series
Diameter and Corner Radius Range

DC \ RE	RE0,2	RE0,3	RE0,5	RE1,0	RE1,5	RE2.0	RE3.0
3	●		●				
4	●		●	●			
5	●		●	●			
6		●	●	●	●		
8		●	●	●	●		
10		●	●	●	●	●	
12			●	●	●	●	●
16				●	●	●	●
20				●	●	●	●

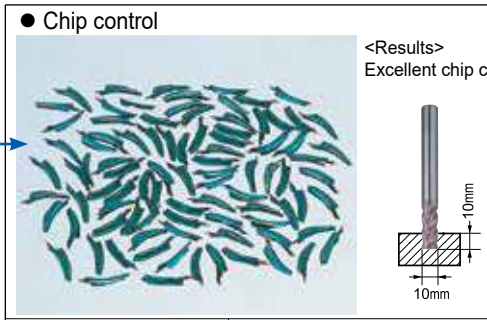
■ Performance

● Feed rate comparisons



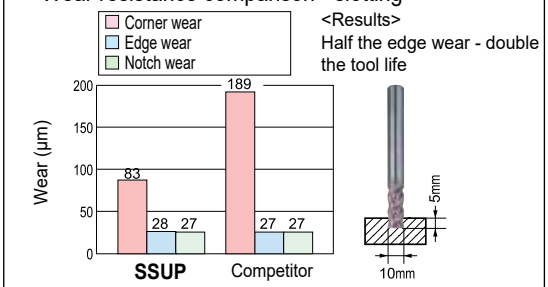
Work material:	Cutting conditions :
X155CrVMo12 1 (HB220) Tool : ø 10 mm, 4 flute Cutting length: 10 m	n = 2250 rpm, v_c = 80 m/min a_p =10 mm, a_e =10mm Dry

● Chip control



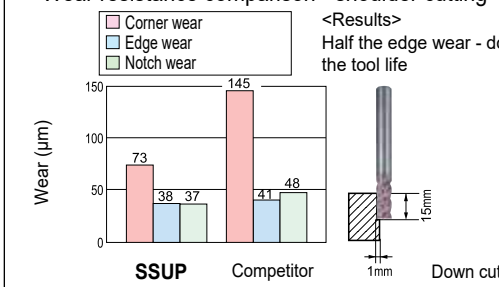
Work material:	Cutting conditions :
X155CrVMo12 1 (HB220) Tool : ø 10 mm, 4 flute	n = 2250 rpm, v_c = 80 m/min f_z = 0,147 mm/tooth (v_f = 1500 mm/min) a_p = 10 mm, a_e = 10 mm, Dry

● Wear resistance comparison - slotting



Work material:	Cutting conditions :
40CrMoV5 H_RC40 Tool : ø 10 mm, 4 flute Cutting length: 7,5 m	n = 1600 rpm, v_c = 50m/min f_z = 0,04 mm/tooth (v_f = 500 mm/min) a_p = 5mm, a_e = 10 mm, Dry

● Wear resistance comparison - shoulder cutting

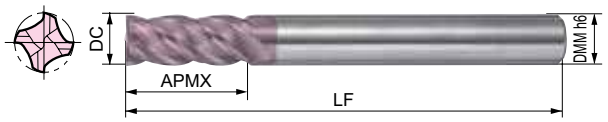


Work material:	Cutting conditions :
X155CrVMo12 1 (HB220) Tool : ø 10mm, 4 flute Cutting length: 15 m	n = 1750 rpm, v_c = 55 m/min f_z = 0,086 mm/tooth (v_f = 600 mm/min) a_p =15 mm, a_e = 1 mm, Dry

● = Euro stock
❍ = Japan stock

ZX Coated SSUP MILL
SSUP 4000ZX Type

Coated carbide grade: ACZ50M



Helix angle : 40˚
Corner : Sharp edge

DC	Tolerance (mm)
D ≤ 3,0	– 0,014 – 0,028
3,0 < D ≤ 6,0	– 0,020 – 0,038
6,0 < D	– 0,025 – 0,047

■ Endmills

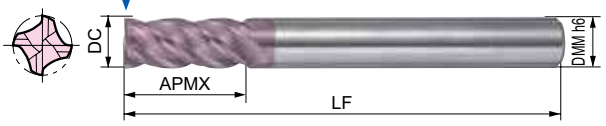
(mm)

Cat. No.	Stock	DC	APMX	LF	DMM
SSUP 4020 ZX	●	2,0	6	50	4
4030 ZX	●	3,0	8	50	6
4040 ZX	●	4,0	11	50	6
4050 ZX	●	5,0	13	60	6
SSUP 4060 ZX	●	6,0	13	60	6
4070 ZX	●	7,0	16	70	8
4080 ZX	●	8,0	19	80	8
4090 ZX	●	9,0	19	90	10
4100 ZX	●	10,0	22	90	10
SSUP 4110 ZX	●	11,0	22	90	12
4120 ZX	●	12,0	26	90	12
4140 ZX	●	14,0	26	110	16
4150 ZX	❍	15,0	26	110	16
SSUP 4160 ZX	●	16,0	32	115	16
4180 ZX	❍	18,0	32	120	20
4200 ZX	●	20,0	38	125	20

ZX Coated SSUP MILL
SSUP 4000ZX-R Type

With Radius Corner

Coated carbide grade: ACZ50M



Helix angle : 40˚
Corner : Sharp edge

DC	Tolerance (mm)
D ≤ 3,0	– 0,014 – 0,028
3,0 < D ≤ 6,0	– 0,020 – 0,038
6,0 < D	– 0,025 – 0,047

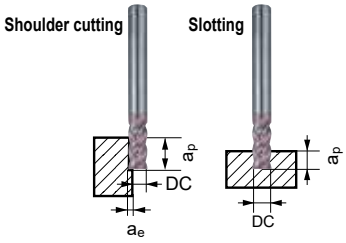
■ Endmills

(mm)

Cat. No.	Stock	DC	RE	APMX	LF	DMM
SSUP 4030 ZX-R02	●	3,0	0,2	8	50	6
4030 ZX-R05	❍	3,0	0,5	8	50	6
SSUP 4040 ZX-R02	●	4,0	0,2	11	50	6
4040 ZX-R05	●	4,0	0,5	11	50	6
4040 ZX-R10		4,0	1,0	11	50	6
SSUP 4050 ZX-R02	●	5,0	0,2	13	60	6
4050 ZX-R05	●	5,0	0,5	13	60	6
4050 ZX-R10	❍	5,0	1,0	13	60	6
SSUP 4060 ZX-R03	●	6,0	0,3	13	60	6
4060 ZX-R05	●	6,0	0,5	13	60	6
4060 ZX-R10	●	6,0	1,0	13	60	6
4060 ZX-R15	❍	6,0	1,5	13	60	6
SSUP 4080 ZX-R03	●	8,0	0,3	13	80	8
4080 ZX-R05	●	8,0	0,5	13	80	8
4080 ZX-R10	●	8,0	1,0	19	80	8
4080 ZX-R15	❍	8,0	1,5	19	80	8
4080 ZX-R20	❍	8,0	2,0	19	80	8
SSUP 4100 ZX-R03	●	10,0	0,3	22	90	10
4100 ZX-R05	●	10,0	0,5	22	90	10
4100 ZX-R10	●	10,0	1,0	22	90	10
4100 ZX-R15	❍	10,0	1,5	22	90	10
4100 ZX-R20	❍	10,0	2,0	22	90	10
SSUP 4120 ZX-R05	●	12,0	0,5	26	90	12
4120 ZX-R10	●	12,0	1,0	26	90	12
4120 ZX-R15	●	12,0	1,5	26	90	12
4120 ZX-R20	❍	12,0	2,0	26	90	12
4120 ZX-R30	❍	12,0	3,0	26	90	12
SSUP 4160 ZX-R10	●	16,0	1,0	32	115	16
4160 ZX-R15	●	16,0	1,5	32	115	16
4160 ZX-R20		16,0	2,0	32	115	16
4160 ZX-R30	❍	16,0	3,0	32	115	16
SSUP 4200 ZX-R10	●	20,0	1,0	38	125	20
4200 ZX-R15		20,0	1,5	38	125	20
4200 ZX-R20	❍	20,0	2,0	38	125	20
4200 ZX-R30		20,0	3,0	38	125	20

■ Recommended Cutting Conditions

Material / Cutting data / DC (mm)	Carbon steel, Cast iron (HB150–250)		Alloy steel, Prehardened steel (HRC25–35)		Hardened steel (HRC40–50)		Stainless steel		Heat resistant alloys Titanium alloy (HRC20–45)	
	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)
2	9000	720	6000	430	4000	320	5500	320	2600	120
4	6600	800	4500	450	3000	380	4000	320	2000	120
6	4800	960	3000	480	2500	380	3000	480	1200	120
8	3600	1000	2200	610	2000	400	2000	520	1000	140
10	2800	1000	1800	610	1500	400	1700	550	800	160
12	2400	950	1500	550	1200	380	1500	500	700	140
14	2200	880	1300	490	1000	360	1200	430	600	130
16	1800	650	1100	420	800	300	1000	360	500	120
18	1600	580	1000	360	750	270	900	340	450	110
20	1400	500	900	330	700	250	820	300	400	100
Shoulder cutting a_p	1,5 DC									
Shoulder cutting a_e	0,1 DC				0,05 DC		0,1 DC		0,05 DC	
Slotting a_p	1,0 DC				0,2 DC		0,3 DC		0,2 DC	

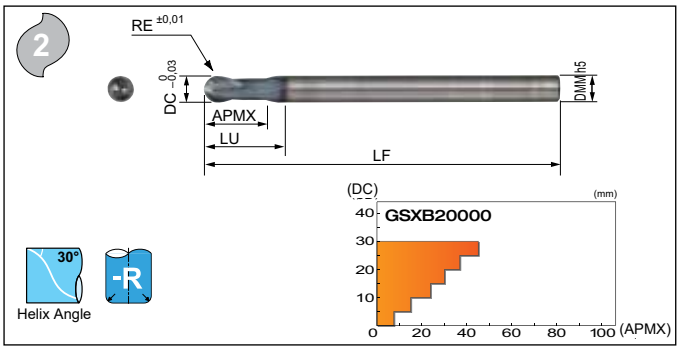


(1) Cutting performance is improved when using a high rigidity machine.
(2) Speeds and feeds should be reduced when slotting some stainless steels.
(3) In case of chatter first check the cutting conditions.

GSXB 20000 Type

Coated Carbide Grades | GSX Coating

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
◎	◎	◎	◎	◎	◎	○		◎	○	○			



Coated carbide grade: **ACB20**

Endmill Identification (GSXB Type)

GSXB 2 0200

Series Code	No. of Teeth	Radius of Ballnose

New "Global Standard" Mills
Ball nose type with 2 teeth

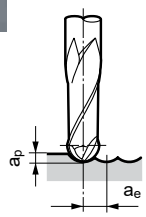
Endmills

(mm)

Cat. No.	Stock	RE	DC	APMX	LU	LF	DMM
GSXB 20020	●	0,20	0,4	0,6	0,8	50	4
GSXB 20030	●	0,30	0,6	0,9	1,2	50	4
GSXB 20050	●	0,50	1,0	1,5	2,0	50	4
GSXB 20075	●	0,75	1,5	2,5	3,0	50	4
GSXB 20100	●	1,00	2,0	3,0	4,0	60	6
GSXB 20125	●	1,25	2,5	4,0	5,0	60	6
GSXB 20150	●	1,50	3,0	4,5	6,0	60	6
GSXB 20200	●	2,00	4,0	6,0	8,0	70	6
GSXB 20250	●	2,50	5,0	7,5	10,0	80	6
GSXB 20300	●	3,00	6,0	9,0	–	80	6
GSXB 20350	●	3,50	7,0	11,0	20,0	90	8
GSXB 20400	●	4,00	8,0	12,0	–	90	8
GSXB 20500	●	5,00	10,0	15,0	–	100	10
GSXB 20600	●	6,00	12,0	18,0	–	110	12
GSXB 20700	●	7,00	14,0	21,0	38,0	110	16
GSXB 20800	●	8,00	16,0	24,0	–	140	16
GSXB 20900	●	9,00	18,0	27,0	50,0	140	20
GSXB 21000	❍	10,00	20,0	30,0	–	160	20
GSXB 21250		12,50	25,0	38,0	–	180	25
GSXB 21500		15,00	30,0	45,0	80,0	180	32

Recommended Cutting Conditions

(1) If cutting noise and vibration are present, please change the cutting conditions accordingly.
(2) If the machine is not designed to achieve the recommended spindle speed, please use the max. spindle speed available.



● Radius Milling

Work Material / Cutting Conditions / RE (mm)	Carbon Steel, Alloy Steel (Below 25HRC) Spindle Speed (rpm)	Carbon Steel, Alloy Steel (Below 25HRC) Feed Rate (mm/min)	Carbon Steel, Alloy Steel (Below 50HRC) Spindle Speed (rpm)	Carbon Steel, Alloy Steel (Below 50HRC) Feed Rate (mm/min)	Cast Iron Special Cast Iron Spindle Speed (rpm)	Cast Iron Special Cast Iron Feed Rate (mm/min)	Stainless Steel Titanium Alloy Spindle Speed (rpm)	Stainless Steel Titanium Alloy Feed Rate (mm/min)
0,20	50.000	2.100	35.000	1.150	50.000	2.100	50.000	1.750
0,30	50.000	2.500	35.000	1.350	50.000	2.500	50.000	2.100
0,50	50.000	3.000	35.000	1.600	50.000	3.000	50.000	2.500
0,75	35.000	3.000	24.000	1.650	35.000	3.200	34.000	2.500
1,00	27.500	3.000	19.000	1.700	35.000	3.900	26.000	2.500
1,25	22.500	3.000	15.500	1.700	28.000	3.900	21.000	2.500
1,50	19.000	3.000	13.000	1.700	24.000	3.900	17.500	2.500
2,00	17.000	3.800	12.000	2.100	20.000	4.100	15.000	2.700
2,50	15.500	4.300	11.000	2.200	18.000	4.600	12.000	2.500
3,00	14.000	4.700	10.500	2.500	16.500	5.300	10.500	2.500
3,50	12.500	4.200	9.000	2.100	14.000	4.500	9.000	2.200
4,00	11.000	3.500	7.900	1.900	12.500	4.000	7.800	1.900
5,00	9.000	2.800	6.300	1.500	10.500	3.300	6.300	1.500
6,00	7.500	2.400	5.200	1.250	8.700	2.800	5.200	1.250
7,00	6.400	2.100	4.500	1.100	7.400	2.400	4.500	1.100
8,00	5.600	1.800	3.900	950	6.500	2.100	3.900	950
9,00	5.000	1.600	3.500	850	5.800	1.900	3.500	850
10,00	4.500	1.450	3.100	750	5.200	1.700	3.150	750
12,50	3.600	1.150	2.500	600	4.200	1.350	2.500	600
15,00	3.000	960	2.100	500	3.500	1.150	2.100	500
Depth and wide of cut a_p	0,02 DC		0,02 DC		0,02 DC		0,02 DC	
Depth and wide of cut a_e	0,05 DC		0,05 DC		0,05 DC		0,05 DC	

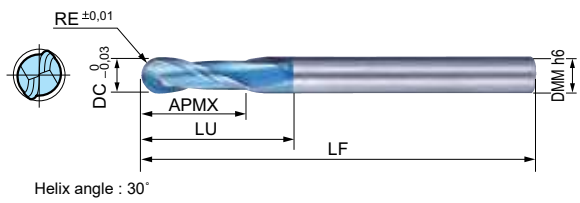
● = Euro stock
❍ = Japan stock

SNB 2000DL Type

DLC (Diamond Like Carbon) Coating

2

DLC coated carbide grade: DL1200



Helix angle : 30˚

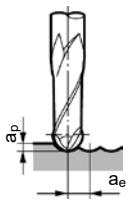
■ Endmills

(mm)

Cat. No.	Stock	RE	DC	APMX	LU	LF	DMM
SNB 2020 DL	●	1,0	2,0	3	5	60	6
2030 DL	●	1,5	3,0	4,5	8	80	6
SNB 2040 DL	●	2,0	4,0	6	12	80	6
2050 DL	●	2,5	5,0	7,5	14	90	6
SNB 2060 DL	●	3,0	6,0	9	-	100	6
2080 DL	●	4,0	8,0	12	-	100	8
2100 DL	●	5,0	10,0	15	-	120	10
SNB 2120 DL	●	6,0	12,0	18	-	120	12
2160 DL	●	8,0	16,0	24	-	160	16

■ Characteristics / Application

- Very smooth AURORA COAT results in low adhesion as well as good surface finish
- With lower cutting forces and high rigidity, this series is suitable for low rigidity machine



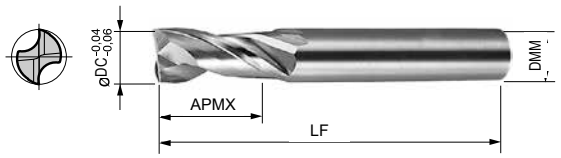
■ Recommended Cutting Conditions

Work Material		Aluminum Alloy			
Cutting data / RE (mm)		Wet (Emulsion)		Dry	
		Speed (rpm)	Feed (mm/min)	Speed (rpm)	Feed (mm/min)
1,0		48.000	1.500	48.000	1.000
1,5		48.000	2.100	48.000	1.500
2,0		31.000	2.800	31.000	2.000
2,5		24.000	2.800	24.000	2.000
3,0		20.000	2.800	20.000	2.000
4,0		15.000	2.800	15.000	2.000
5,0		13.000	3.000	13.000	2.100
6,0		10.000	3.000	10.000	2.100
8,0		7.700	3.000	7.700	2.100
Depth and wide of cut	a_p	1,5 DC		1,0 DC	
	a_e	0,2 DC		(DC)	

ASM 2000 Type

2

Carbide grade: H1 (Micrograin)



Helix angle : 30˚
Corner : Sharp edge

■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LF	DMM
ASM 2020	❍	2,0	6	40	4
2030	❍	3,0	10	45	6
2040	❍	4,0	12	45	6
2050	❍	5,0	15	50	6
ASM 2060	❍	6,0	15	50	6
2080	❍	8,0	18	60	8
2100	❍	10,0	22	71	10
ASM 2120	❍	12,0	25	75	12
2140	❍	14,0	32	90	16
2150	❍	15,0	32	90	16
2160	❍	16,0	32	90	16

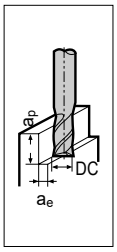
Uncoated Endmills

Recommended Conditions

(Shoulder processing) a_p =1,5 x DC
a_e =0,1 x DC

DC \ Material		Al-alloy	Cast iron
1 – 2,5	v_c	100-**200**-300	100-**120**-150
	f_z	0,004–0,017	0,008–0,020
3 – 5	v_c	100-**200**-300	100-**120**-150
	f_z	0,018–0,036	0,027–0,060
6 – 12	v_c	100-**200**-300	100-**120**-150
	f_z	0,038–0,070	0,065–0,157
14 – 16	v_c	100-**200**-300	100-**120**-150
	f_z	0,075–0,125	0,160–0,250

v_c =m/min f_z =mm/tooth



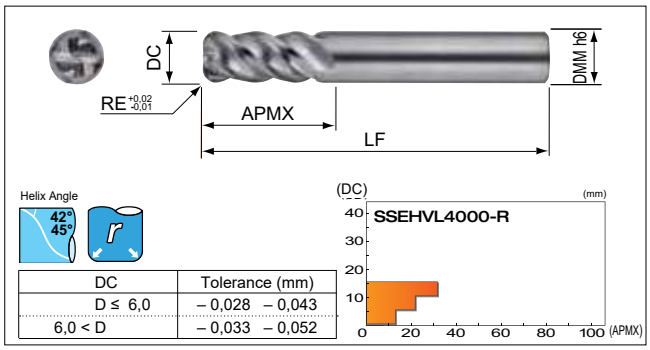
● = Euro stock
❍ = Japan stock

Anti-Vibration Type Radius Endmills for Exotic Alloys

SSEHVL 4000-R Type

Uncoated Carbide | 4

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
								○	◎				



DC	Tolerance (mm)
D ≤ 6,0	– 0,028 – 0,043
6,0 < D	– 0,033 – 0,052

Carbide grade: EH520

■ Endmills

(mm)

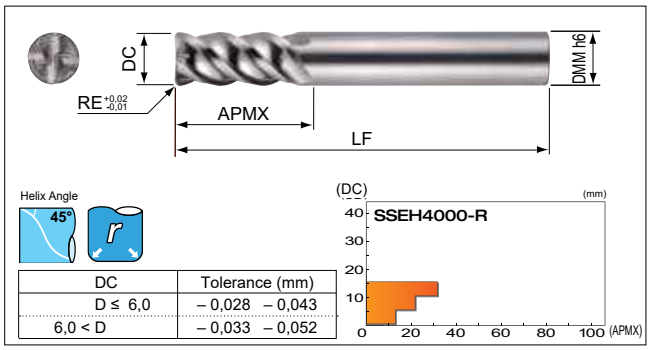
Cat. No.	Stock	DC	APMX	LU	LF	DMM
SSEHVL 4045-R05		4,5	0,5	12	50	6
SSEHVL 4045-R10		4,5	1,0	12	50	6
SSEHVL 4050-R05		5,0	0,5	13	60	6
SSEHVL 4050-R10	❍	5,0	1,0	13	60	6
SSEHVL 4060-R10	❍	6,0	1,0	13	60	6
SSEHVL 4080-R10	❍	8,0	1,0	19	80	8
SSEHVL 4100-R10	❍	10,0	1,0	22	90	10
SSEHVL 4100-R30	❍	10,0	3,0	22	90	10
SSEHVL 4120-R10	●	12,0	1,0	26	90	12
SSEHVL 4120-R30	●	12,0	3,0	26	90	12
SSEHVL 4160-R10	❍	16,0	1,0	32	115	16
SSEHVL 4160-R30	●	16,0	3,0	32	115	16

Radius Endmills for Exotic Alloys

SSEH 4000-R Type

Uncoated Carbide | 4

Structual Steel	Carbon Steel	Alloy Steel	Pre-hardened Steel	Tempered Die Steel	Hardened Steel 45~55 HRC	Hardened Steel 55~60 HRC	Hardened Steel 60~65 HRC	Stainless Steel	Ti Alloy / Heat Resistant Alloy	Cast iron	Al Alloy	Cu Alloy	Graphite
								○	◎				



DC	Tolerance (mm)
D ≤ 6,0	– 0,028 – 0,043
6,0 < D	– 0,033 – 0,052

Carbide grade: EH520

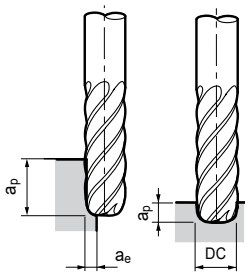
■ Endmills

(mm)

Cat. No.	Stock	DC	APMX	LU	LF	DMM
SSEH 4045-R05		4,5	0,5	12	50	6
SSEH 4045-R10		4,5	1,0	12	50	6
SSEH 4050-R05		5,0	0,5	13	60	6
SSEH 4050-R10		5,0	1,0	13	60	6
SSEH 4060-R10	❍	6,0	1,0	13	60	6
SSEH 4080-R10		8,0	1,0	19	80	8
SSEH 4100-R10		10,0	1,0	22	90	10
SSEH 4100-R30	❍	10,0	3,0	22	90	10
SSEH 4120-R10	❍	12,0	1,0	26	90	12
SSEH 4120-R30	❍	12,0	3,0	26	90	12
SSEH 4160-R10		16,0	1,0	32	115	16
SSEH 4160-R30	●	16,0	3,0	32	115	16

■ Characteristics / Application

1. For stable machining, a more rigid machine is recommended.
2. Wet machining is recommended for stainless steel and heat resistant alloy applications.
3. If cutting noise and vibration are present, please change the cutting conditions accordingly.



● Shoulder Milling

Work Material / Cond. / DC (mm)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Titanium Alloy Spindle Speed (rpm)	Titanium Alloy Feed Rate (mm/min)	Heat Resistive Steel Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
4.5	2.300	120	4.600	370	1.600	130
5.0	2.000	130	4.100	410	1.500	150
6.0	1.700	130	3.400	400	1.200	140
8.0	1.300	130	2.600	360	900	130
10.0	1.000	130	2.100	340	700	110
12.0	800	110	1.700	300	600	100
16.0	600	90	1.300	260	500	100
Shoulder cutting a_p	1,5 DC					
Shoulder cutting a_e	0,1 DC		0,05 DC		0,05 DC	

● Grooving

Work Material / Cond. / DC (mm)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Titanium Alloy Spindle Speed (rpm)	Titanium Alloy Feed Rate (mm/min)	Heat Resistive Steel Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
4,5	1.800	50	3.200	250	1.300	110
5,0	1.600	50	2.900	290	1.200	120
6,0	1.400	50	2.400	290	1.000	120
8,0	1.000	50	1.800	250	700	90
10,0	800	50	1.400	230	600	100
12,0	600	50	1.200	210	500	90
16,0	500	40	900	180	400	80
Grooving a_p	0,3 DC		0,2 DC		0,15 DC	

● Shoulder Milling

Work Material / Cond. / DC (mm)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Titanium Alloy Spindle Speed (rpm)	Titanium Alloy Feed Rate (mm/min)	Heat Resistive Steel Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
4,5	1.800	90	3.500	280	1.400	110
5,0	1.600	100	3.200	320	1.300	130
6,0	1.300	100	2.700	320	1.100	130
8,0	1.000	100	2.000	280	800	110
10,0	800	100	1.600	260	600	100
12,0	700	100	1.300	230	500	90
16,0	500	80	1.000	200	400	80
Shoulder cutting a_p	1,5 DC					
Shoulder cutting a_e	0,1 DC		0,05 DC		0,05 DC	

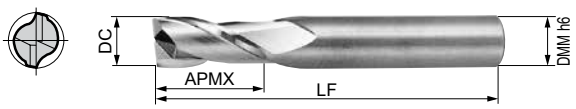
● Grooving

Work Material / Cond. / DC (mm)	Stainless Steel Spindle Speed (rpm)	Stainless Steel Feed Rate (mm/min)	Titanium Alloy Spindle Speed (rpm)	Titanium Alloy Feed Rate (mm/min)	Heat Resistive Steel Spindle Speed (rpm)	Heat Resistive Steel Feed Rate (mm/min)
4,5	1.400	40	2.500	200	1.100	90
5,0	1.300	40	2.200	220	1.000	100
6,0	1.100	40	1.900	230	800	100
8,0	800	40	1.400	200	600	80
10,0	600	40	1.100	180	500	80
12,0	500	40	900	160	400	70
16,0	400	30	700	140	300	60
Grooving a_p	0,3 DC		0,2 DC		0,15 DC	

Solid Carbide Spiral Endmills
SSM 2000 Type (ø0,2–ø4,3)

2

Carbide grade: A1 (Micrograin)



Helix angle : 30˚
Corner : Sharp edge

DC	Tolerance (mm)
D ≤ 6,0	– 0,010 – 0,030

■ Endmills

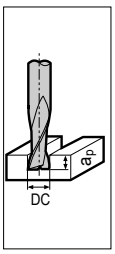
(mm)

Cat. No.		Stock	DC	APMX	LF	DMM
SSM	2002	❍	0,2	0,5	40	3
	2003	●	0,3	1,0	40	3
	2004	●	0,4	1,0	40	3
	2005	●	0,5	1,5	40	3
SSM	2006	●	0,6	1,5	40	3
	2007	●	0,7	1,5	40	3
	2008	●	0,8	2,0	40	3
	2009		0,9	2,0	40	3
	2010	●	1,0	3,0	40	4
SSM	2011	❍	1,1	3,0	40	4
	2012	❍	1,2	3,0	40	4
	2013		1,3	3,0	40	4
	2014	❍	1,4	3,0	40	4
	2015	●	1,5	5,0	40	4
SSM	2016	❍	1,6	5,0	40	4
	2017		1,7	5,0	40	4
	2018	❍	1,8	5,0	40	4
	2019	❍	1,9	5,0	40	4
	2020	●	2,0	6,0	40	4
SSM	2021		2,1	6,0	40	4
	2022	❍	2,2	6,0	40	4
	2023	❍	2,3	6,0	40	4
	2024	❍	2,4	6,0	40	4
	2025	●	2,5	8,0	40	4
SSM	2026	❍	2,6	8,0	40	4
	2027	●	2,7	8,0	40	4
	2028		2,8	8,0	40	4
	2029		2,9	8,0	40	4
	2030	●	3,0	8,0	45	6
SSM	2031		3,1	8,0	45	6
	2032	❍	3,2	8,0	45	6
	2033		3,3	8,0	45	6
	2034	❍	3,4	8,0	45	6
	2035	●	3,5	8,0	45	6
SSM	2036		3,6	10,0	45	6
	2037		3,7	10,0	45	6
	2038	❍	3,8	10,0	45	6
	2039	❍	3,9	10,0	45	6
	2040	●	4,0	10,0	45	6
SSM	2041		4,1	10,0	45	6
	2042	❍	4,2	10,0	45	6
	2043		4,3	10,0	45	6

Recommended Conditions

(Slotting) DC < ø 3; a_p =0,5 x DC
DC ≥ ø 3; a_p =1,0 x DC

DC \ Material		Carbon steel, Alloy steel (BelowHRC30)	Carbon steel, Alloy steel (BelowHRC40)	Carbon steel, Alloy steel (BelowHRC45)	Cast iron
0,2–0,9	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	–0,002	–0,002	–0,001	0,002–0,004
1,0–2,9	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,003–0,010	0,003–0,010	0,002–0,005	0,005–0,017
3,0–4,9	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,012–0,024	0,012–0,024	0,006–0,011	0,018–0,040

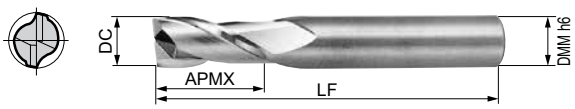


v_c =m/min f_z =mm/tooth

Solid Carbide Spiral Endmills
SSM 2000 Type (ø4,4–ø8,5)

2

Carbide grade: A1 (Micrograin)



Helix angle : 30˚
Corner : Sharp edge

DC	Tolerance (mm)
D ≤ 6,0	– 0,010 – 0,030

■ Endmills

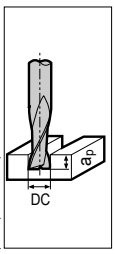
(mm)

Cat. No.		Stock	DC	APMX	LF	DMM
SSM	2044	❍	4,4	10	45	6
	2045	❍	4,5	10	45	6
SSM	2046		4,6	12	50	6
	2047		4,7	12	50	6
	2048	❍	4,8	12	50	6
	2049	❍	4,9	12	50	6
	2050	●	5,0	12	50	6
SSM	2051	❍	5,1	12	50	6
	2052	❍	5,2	12	50	
	2053		5,3		50	
	2054		5,4	12	50	6
	2055		5,5	12	50	6
SSM	2056		5,6	12	50	6
	2057		5,7	12	50	6
	2058		5,8	12	50	6
	2059		5,9	12	50	6
	2060	●	6,0	12	50	6
SSM	2061		6,1	12	50	6
	2062	❍	6,2	12	50	6
	2063	❍	6,3	12	50	6
	2064	❍	6,4	12		6
	2065	❍	6,5	12	50	8
SSM	2066	❍	6,6		55	8
	2067		6,7	15	55	8
	2068		6,8	15	55	8
	2069		6,9	15	55	8
	2070	●	7,0	15	55	8
SSM	2071	❍	7,1	15	55	8
	2072		7,2	15	55	8
	2073		7,3	15	55	8
	2074		7,4	15	55	8
	2075	●	7,5	15	55	8
SSM	2076		7,6	15	55	8
	2077		7,7	15	55	8
	2078		7,8	15	55	8
	2079		7,9	15	55	8
	2080	●	8,0	15	55	8
SSM	2081	❍	8,1	15	55	8
	2082	❍	8,2	15	55	8
	2083		8,3	15	55	8
	2084		8,4	15	55	8
	2085	●	8,5	15	55	10

Recommended Conditions

(Slotting) DC ≥ ø3; a_p =1,0 x DC

DC \ Material		Carbon steel, Alloy steel (BelowHRC30)	Carbon steel, Alloy steel (BelowHRC40)	Carbon steel, Alloy steel (BelowHRC45)	Cast iron
5–5,9	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,012–0,024	0,012–0,024	0,006–0,011	0,018–0,040
6–8,9	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,025–0,050	0,025–0,050	0,013–0,025	0,045–0,105



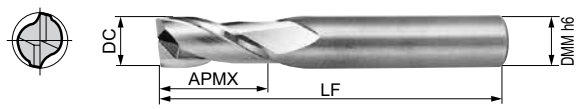
v_c =m/min f_z = mm/tooth

● = Euro stock
❍ = Japan stock

Solid Carbide Spiral Endmills
SSM 2000 Type (ø8,6–ø30)

2

Carbide grade: A1 (Micrograin)



Helix angle : 30˚
Corner : Sharp edge

DC	Tolerance (mm)
6,0 < D ≤ 10,0	– 0,015 – 0,040
10,0 < D	– 0,020 – 0,050

■ Endmills

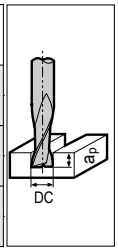
(mm)

Cat. No.	Stock	DC	APMX	LF	DMM
SSM 2086	❍	8,6	15	55	10
2087		8,7	15	55	10
2088		8,8	15	55	10
2089		8,9	15	55	10
2090	●	9,0	15	55	10
SSM 2091		9,1	15	55	10
2092	❍	9,2	15	55	10
2093		9,3	15	55	10
2094		9,4	15	55	10
2095		9,5	15	55	10
SSM 2096		9,6	18	65	10
2097		9,7	18	65	10
2098		9,8	18	65	10
2099		9,9	18	65	10
2100	●	10,0	18	65	10
SSM 2105		10,5	18	70	12
2110		11,0	18	70	12
2115	❍	11,5	18	70	12
2120	●	12,0	18	70	12
2125		12,5	20	80	16
SSM 2130		13,0	20	80	16
2135	❍	13,5		80	16
2140	●	14,0	20	80	16
2145		14,5	25	80	16
2150		15,0	25	80	16
SSM 2155		15,5	35	90	16
2160	●	16,0	35	90	16
2165		16,5	35	90	20
2170	●	17,0	35	90	20
2175	❍	17,5	40	105	20
SSM 2180		18,0	40	105	20
2185		18,5	40	105	20
2190		19,0	40	105	20
2195		19,5	40	105	20
2200	●	20,0	40	105	20
SSM 2210	❍	21,0	40	105	25
2220		22,0	40		25
2230			45	115	25
2240		24,0	45	115	25
2250	❍		50		25
SSM 2300			55	130	32

Recommended Conditions

(Slotting) DC ≥ ø3; a_p =1,0 x DC

DC \ Material		Carbon steel, Alloy steel (BelowHRC30)	Carbon steel, Alloy steel (BelowHRC40)	Carbon steel, Alloy steel (BelowHRC45)	Cast iron
9–12,5	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,025–0,050	0,025–0,050	0,013–0,025	0,045–0,105
13–19,5	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,055–0,085	0,055–0,085	0,030–0,050	0,110–0,170
20–30	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,095–0,120	0,095–0,120	0,055–0,070	0,185–0,260

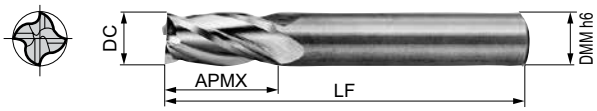


v_c =m/min f_z =mm/tooth

Solid Carbide Spiral Endmills
SSM 4000 Type (ø1,5–ø25)

4

Carbide grade: A1 (Micrograin)



Helix angle : 30˚
Corner : Sharp edge

DC	Tolerance (mm)
D ≤ 6,0	– 0,010 – 0,030
6,0 < D ≤ 10,0	– 0,015 – 0,040
10,0 < D	– 0,020 – 0,050

■ Endmills

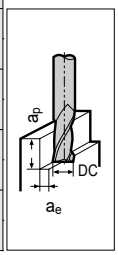
(mm)

Cat. No.	Stock	DC	APMX	LF	DMM
SSM 4015	●	1,5	5	40	4
4020	●	2,0	6	40	4
4025	❍	2,5	8	40	4
4030	●	3,0	8	45	6
4035		3,5	8	45	6
SSM 4040	●	4,0	10	45	6
4045		4,5	10	45	6
4050	●	5,0	12	50	6
4055		5,5	12	50	6
4060	●	6,0	12	50	6
SSM 4065		6,5	12	50	8
4070	●	7,0	15	55	8
4075	●	7,5	15	55	8
4080	●	8,0	15	55	8
4085	❍	8,5	15	55	10
SSM 4090	●	9,0	15	55	10
4095	●	9,5	15	55	10
4100	●	10,0	18	65	10
4105		10,5	18	65	12
4110		11,0	18	70	12
SSM 4120	●	12,0	18	70	12
4130		13,0	20	80	16
4140	●	14,0	20	80	16
4150		15,0	25	80	16
4160	●	16,0	35	90	16
SSM 4170		17,0	35	90	20
4180		18,0	40	105	20
4190		19,0	40	105	20
4200	●	20,0	40	105	20
4210		21,0	40	105	25
SSM 4220		22,0	40	105	25
4230		23,0	45	115	25
4240		24,0	45	115	25
4250		25,0	50	120	25

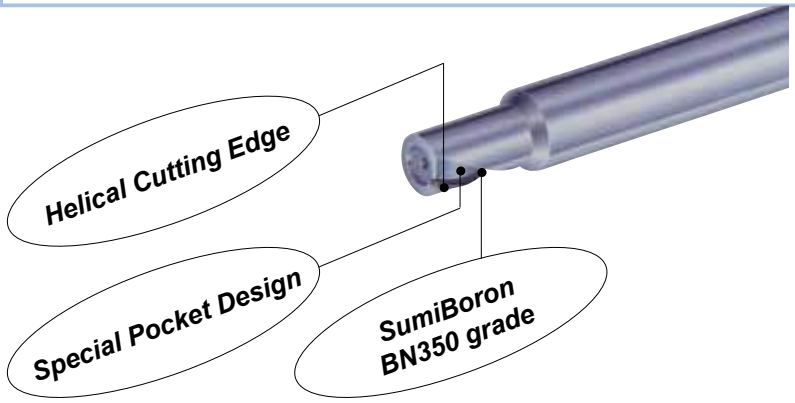
Recommended Conditions

(Shoulder processing) a_p =1,5 x DC
a_e =0,1 x DC

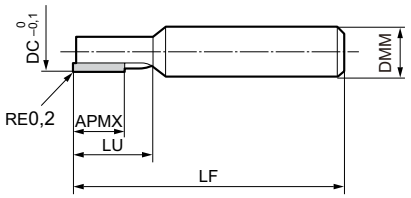
DC \ Material		Carbon steel, Alloy steel (BelowHRC30)	Carbon steel, Alloy steel (BelowHRC40)	Carbon steel, Alloy steel (BelowHRC45)	Cast iron
1 ~ 2,9	v_c	40–**50**–60	30–**0**–50	20–**30**–40	40–**50**–60
	f_z	0,004–0,017	0,004–0,017	0,002–0,008	0,008–0,020
3 ~ 5,9	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,018–0,036	0,018–0,036	0,009–0,018	0,027–0,060
6 ~ 12,9	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,038–0,070	0,038–0,070	0,019–0,035	0,065–0,157
13 ~ 19,9	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,075–0,125	0,075–0,125	0,040–0,075	0,160–0,250
20 ~	v_c	40–**50**–60	30–**40**–50	20–**30**–40	40–**50**–60
	f_z	0,135–0,170	0,135–0,170	0,085–0,110	0,257–0,390



v_c =m/min f_z =mm/tooth



■ Endmills BNES Type with 1 Spiral Flute

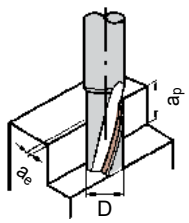


Helix angle : 15°
right-hand cut, right-hand helix

Cat. No.	Stock	Dimensions (mm)				
	BN350	DC	DMM	APMX	LU	LF
BNES 1060	❍	6,0	10	7,0	11	60
1080	❍	8,0	10	10,0	14	70
1100	❍	10,0	12	12,0	17	75
1120	❍	12,0	12	14,0	20	80
1140	❍	14,0	16	16,0	21,5	80

■ Recommended Cutting Conditions

Cutting speed: v_c (m/min), Spindle revolutions: n (rpm), Feed per tooth: f_z (mm/tooth), Feed speed: v_f (mm/min)

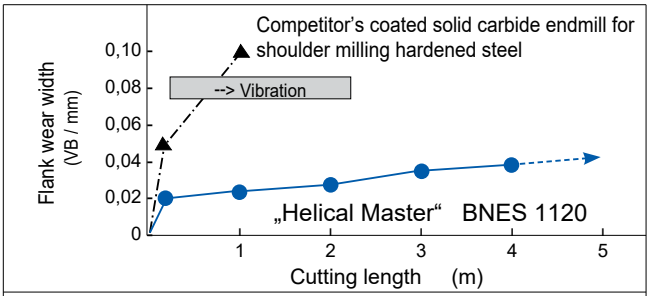
Tooling example	DC	Hardened steel (H_RC 50–57)			Hardened steel (H_RC 58–65)		
		v_c = 100–170 m/min			v_c = 80–150 m/min		
	6–8	$a_e \leq$ 0,1 mm	n = 4000–9000	v_f (mm/min) = 240–540	$a_e \leq$ 0,08 mm	n = 3200–8000	v_f (mm/min) = 150–370
	10–12	$a_e \leq$ 0,15 mm	n = 2700–5400	v_f (mm/min) = 180–360	$a_e \leq$ 0,12 mm	n = 2100–4800	v_f (mm/min) 120–270
	14–16	$a_e \leq$ 0,2 mm	n = 2000–3800	v_f (mm/min) = 140–260	$a_e \leq$ 0,15 mm	n = 1600–3400	v_f (mm/min) = 110–230

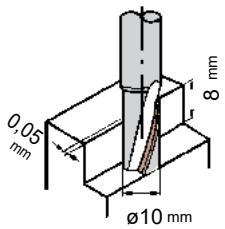
Depth of cut : $a_p \leq$ D

Recommendation: Dry cutting (Air coolant)
Down-cut milling
Minimise the overhang
Use a rigid machine

■ Performance

● Long Tool Life and High Efficiency





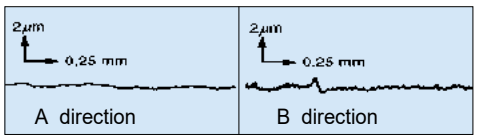
Work material: X155CrVMo12-1
Hardness: H_RC 60

Cutting data:
v_c = 100 m/min (**Helical Master**)
v_c = 40 m/min (Competitor's coated solid carbide endmill)
v_f = 186 mm/min

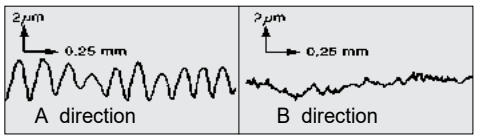
Down-cut milling
Dry cutting

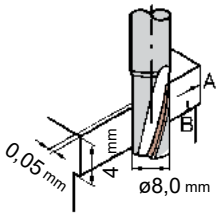
● Excellent Surface Roughness

"Helical Master" BNES 1080 ø 8,0



Conventional straight flute CBN endmill, ø 8,0





Work material: 15Cr3
Hardness: H_RC 55–58
Cutting data: v_c = 130 m/min
v_f = 310 mm/min

Down-cut milling
Dry cutting

● = Euro stock
❍ = Japan stock

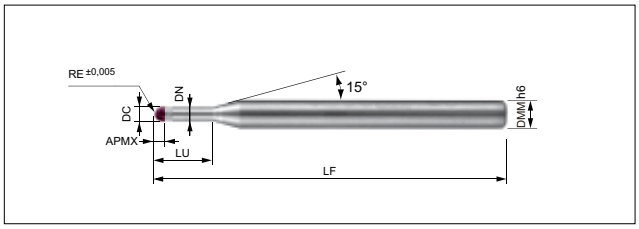
SUMIBORON "MOULD Finish Master"

BNBP Type

Characteristics / Application

- High precision machining of hardened steels < HRC70 with long tool life
- Super tough grade SUMIBORON BN350 prevents chipping of the cutting edge
- RE accuracy : ±0,005 mm

Endmills



Identification Details

BNBP 2 R020 - 012 4

- Endmill Series
- Number of teeth
- Radius of ball nose
- Neck length (LU)
- Shank Diam.

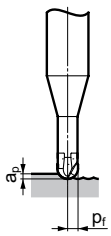
Dimensions (mm)

Cat. No.	Stock	RE	DC	APMX	LU	LF	DN	DMM
BNBP 2R0200124	●	0,20	0,4	0,3	1,2	50	0,37	4
2R0200126	●	0,20	0,4	0,3	1,2	50	0,37	6
2R0200204	❍	0,20	0,4	0,3	2,0	50	0,37	4
2R0200304	❍	0,20	0,4	0,3	3,0	50	0,37	4
2R0200404	❍	0,20	0,4	0,3	4,0	50	0,37	4
BNBP 2R0300154	●	0,30	0,6	0,4	1,5	50	0,57	4
2R0300156	●	0,30	0,6	0,4	1,5	50	0,57	6
2R0300304	❍	0,30	0,6	0,4	3,0	50	0,57	4
2R0300404	❍	0,30	0,6	0,4	4,0	50	0,57	4
2R0300504	❍	0,30	0,6	0,4	5,0	50	0,57	4
2R0300604	❍	0,30	0,6	0,4	0,6	50	0,57	4
BNBP 2R0500254	●	0,50	1,0	0,6	2,5	50	0,97	4
2R0500256	●	0,50	1,0	0,6	2,5	50	0,97	6
2R0500304	❍	0,50	1,0	0,6	3,0	50	0,97	4
2R0500404	❍	0,50	1,0	0,6	4,0	50	0,97	4
2R0500604	❍	0,50	1,0	0,6	0,6	50	0,97	4
2R0500804	❍	0,50	1,0	0,6	8,0	50	0,97	4
BNBP 2R0750404	❍	0,75	1,5	0,9	4,0	50	1,47	4
2R0750406	●	0,75	1,5	0,9	4,0	50	1,47	6
BNBP 2R1000554	●	1,00	2,0	1,4	5,5	50	1,97	4
2R1000556	●	1,00	2,0	1,4	5,5	50	1,97	6
2R1000804	❍	1,00	2,0	1,4	8,0	50	1,97	4

Grade: BN350

Recommended Cutting Conditions

Work Material		STAVAX, NAK80, SKD61 (< 52HRC)				ELMAX, DC53, SKD11 (< 62HRC)				YXR3, SKH (< 70HRC)			
RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	ap (mm)	pf (mm)
0,2	1,2	40.000	1.000	0,005	0,010	40.000	800	0,005	0,010	40.000	600	0,005	0,005
	2,0	40.000	800	0,005	0,010	40.000	600	0,005	0,010	40.000	400	0,005	0,005
	3,0	40.000	600	0,005	0,010	40.000	500	0,005	0,010	40.000	300	0,005	0,005
	4,0	40.000	500	0,005	0,010	40.000	400	0,005	0,005	40.000	200	0,005	0,005
0,3	1,5	40.000	1.600	0,020	0,020	40.000	1.400	0,010	0,020	40.000	1.200	0,010	0,020
	2,0	40.000	1.500	0,010	0,020	40.000	1.300	0,010	0,020	40.000	1.100	0,010	0,010
	3,0	40.000	1.400	0,010	0,020	40.000	1.200	0,010	0,020	40.000	1.000	0,010	0,010
	4,0	30.000	1.200	0,010	0,010	30.000	1.000	0,010	0,010	30.000	700	0,005	0,010
	5,0	30.000	800	0,010	0,010	30.000	700	0,005	0,010	30.000	600	0,005	0,005
	6,0	30.000	600	0,005	0,010	30.000	500	0,005	0,005	30.000	400	0,005	0,005
0,5	2,5	40.000	2.800	0,040	0,050	40.000	2.800	0,030	0,040	40.000	2.200	0,020	0,030
	3,0	40.000	2.600	0,040	0,050	40.000	2.600	0,030	0,040	40.000	2.100	0,020	0,030
	4,0	40.000	2.400	0,030	0,050	40.000	2.400	0,020	0,030	40.000	2.000	0,020	0,020
	6,0	25.000	1.500	0,020	0,030	25.000	1.500	0,010	0,020	25.000	1.300	0,010	0,010
	8,0	16.000	1.200	0,020	0,020	16.000	1.100	0,010	0,020	16.000	850	0,010	0,010
0,75	4,0	32.000	2.400	0,030	0,030	32.000	2.200	0,020	0,030	32.000	2.000	0,020	0,020
1,0	5,5	40.000	4.000	0,050	0,050	40.000	4.000	0,030	0,030	40.000	3.000	0,020	0,030
	8,0	32.000	3.000	0,030	0,050	32.000	2.600	0,020	0,030	32.000	2.200	0,010	0,020

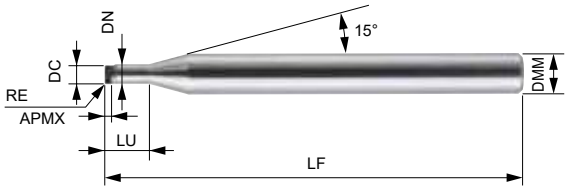


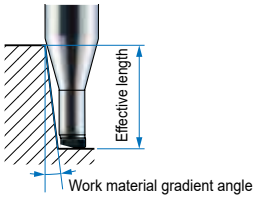
Important Notes

(1) For stable machining, a more rigid machine is recommended.
(2) Air blast or oil mist coolant is recommended.
(3) Shorten overhang as much as possible.

NPDRS Type

SUMIDIA Binderless Radius Endmill **NPDRS** Type





NPDRS Type Body (for Standard Finishing)

Cat. No.	Stock	Dimensions (mm)							Real effective length with respect to work material gradient angle				
	NPD10	DC	RE	APMX	LU	LF	DN	DMM	0,5°	1°	1,5°	2°	3°
NPDRS 1020 R002-006	❍	0,2	0,02	0,10	0,6	40	0,175	4	0,61	0,62	0,63	0,64	0,66
1020 R005-006	❍	0,2	0,05	0,10	0,6	40	0,175	4	0,61	0,62	0,63	0,64	0,66
1030 R002-010	❍	0,3	0,02	0,15	1,0	40	0,27	4	1,01	1,03	1,04	1,06	1,09
1030 R005-010	❍	0,3	0,05	0,15	1,0	40	0,27	4	1,01	1,03	1,04	1,06	1,09
1050 R005-015	❍	0,5	0,05	0,25	1,5	40	0,47	4	1,61	1,66	1,72	1,78	1,92
NPDRS 1050 R010-015	❍	0,5	0,10	0,25	1,5	40	0,47	4	1,61	1,66	1,71	1,77	1,91
1100 R005-030	❍	1,0	0,05	0,55	3,0	40	0,95	4	3,40	3,52	3,65	3,78	4,08
1100 R010-030	❍	1,0	0,10	0,55	3,0	40	0,95	4	3,40	3,52	3,64	3,77	4,07
1100 R020-030	❍	1,0	0,20	0,55	3,0	40	0,95	4	3,40	3,51	3,63	3,76	4,05
1200 R005-040	❍	2,0	0,05	0,55	4,0	40	1,95	4	4,44	4,59	4,75	4,93	5,33
NPDRS 1200 R010-040	❍	2,0	0,10	0,55	4,0	40	1,95	4	4,43	4,59	4,75	4,92	5,31
1200 R020-040	❍	2,0	0,20	0,55	4,0	40	1,95	4	4,43	4,58	4,74	4,91	5,29

Identification Details

NPDR	S	1	020	R002	-	006
Series Code	For standard finishing	No. of flutes	Cutting diameter	Corner radius		Length below neck

Cutting Diameter and Nose Radius Combinations

DC	RE 0,02	RE 0,05	RE 0,1	RE 0,2
0,2	❍	❍		
0,3	❍	❍		
0,5		❍	❍	
1,0		❍	❍	❍
2,0		❍	❍	❍

Recommended Cutting Conditions

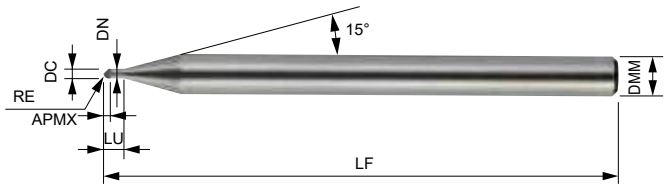
- Use a machine with high rigidity for stable cutting.
- Non-water soluble coolant recommended. Supply as a mist or external coolant.
  Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
- Shorten overhang as much as possible.
- Adjust cutting conditions as necessary as machine rigidity and other conditions may vary.
- Depth of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface finish.

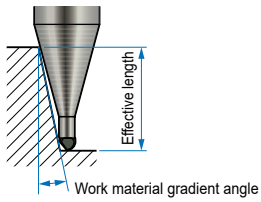
Work Material		Carbide			
DC (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p (mm)	p_f (mm)
0,2	0,10	40.000	100	0,001	0,001
0,3	0,15	40.000	150	0,002	0,001
0,5	0,25	40.000	200	0,003	0,001
1,0	0,55	40.000	400	0,005	0,003
2,0	0,55	40.000	600	0,010	0,005

❍ = Japan stock

NPDB(S) Type

SUMIDIA Binderless Ballnose Endmill **NPDBS** Type / **NPDB** Type





■ NPDBS Type Body (for Standard Finishing)

Cat. No.	Stock	Dimensions (mm)							Real effective length with respect to work material gradient angle				
	NPD10	RE	DC	APMX	LU	LF	DN	DMM	0,5°	1°	1,5°	2°	3°
NPDBS 1010-004	❍	0,1	0,2	0,1	0,4	40	0,18	4	0,44	0,45	0,46	0,47	0,49
1020-008	❍	0,2	0,4	0,2	0,8	40	0,38	4	0,83	0,84	0,85	0,86	0,89
1030-010	❍	0,3	0,6	0,3	1,0	40	0,58	4	1,05	1,08	1,10	1,13	1,20
1050-020	❍	0,5	1,0	0,5	2,0	40	0,95	4	2,08	2,13	2,19	2,24	2,38
1100-030	❍	1,0	2,0	1,0	3,0	40	1,95	4	3,13	3,20	3,27	3,35	3,53

■ NPDB Type Body (for Precision Finishing)

Cat. No.	Stock	Dimensions (mm)							Real effective length with respect to work material gradient angle				
	NPD10	RE	DC	APMX	LU	LF	DN	DMM	0,5°	1°	1,5°	2°	3°
NPDB 1010-004	❍	0,1	0,2	0,1	0,4	40	0,18	4	0,44	0,45	0,46	0,47	0,49
1020-008	❍	0,2	0,4	0,2	0,8	40	0,38	4	0,83	0,84	0,85	0,86	0,89
1030-010	❍	0,3	0,6	0,3	1,0	40	0,58	4	1,05	1,08	1,10	1,13	1,20
1050-020	❍	0,5	1,0	0,5	2,0	40	0,95	4	2,08	2,13	2,19	2,24	2,38
1100-030	❍	1,0	2,0	1,0	3,0	40	1,95	4	3,13	3,20	3,27	3,35	3,53

■ Identification Details

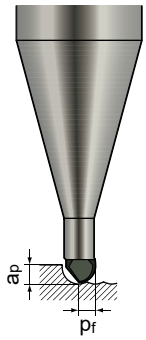
NPDB	**(S)**	**1**	**030**	**- 010**
Series Code	For standard finishing	No. of flutes	Ballnose radius	Length below neck

■ Recommended Cutting Conditions

- Use a machine with high rigidity for stable cutting.
- Non-water soluble coolant recommended. Supply as a mist or external coolant.
  Take fire prevention precautions to avoid fire hazards caused by sparks igniting during machining or tool breakage.
- Shorten overhang as much as possible.
- Adjust cutting conditions as necessary as machine rigidity and other conditions may vary.
- Depth of cut shown in the table of conditions are maximum depths. Adjust the actual depth of cut to the desired machined surface finish.

● Flat Surface Finishing

Work Material		Carbide			
RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p (mm)	p_f (mm)
0,1	0,4	40.000	100	0,001	0,001
0,2	0,8	40.000	150	0,001	0,001
0,3	1,0	40.000	200	0,001	0,001
0,5	2,0	40.000	400	0,001	0,003
1,0	3,0	40.000	600	0,001	0,005

● Copy Finishing

Work Material		Carbide			
RE (mm)	LU (mm)	Spindle Speed (min^{-1})	Feed Rate (mm/min)	a_p (mm)	p_f (mm)
0,1	0,4	40.000	100	0,001	0,001
0,2	0,8	40.000	150	0,002	0,001
0,3	1,0	40.000	200	0,003	0,001
0,5	2,0	40.000	400	0,005	0,003
1,0	3,0	40.000	600	0,010	0,005