

WAX Type



General Features

SEC-WaveMill WAX type is a high speed and high efficiency cutter capable of rough milling to finishing of Non-Ferrous Metals such as Aluminum alloy.

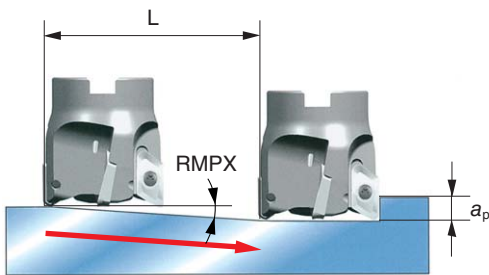
Characteristics

- For Ramping (Slant Milling)
- For Helical Milling
- Safety Design
Prevents dislodging of inserts caused by centrifugal forces.
- Coolant Supply
Coolant holes are a standard feature for the whole series.
- Excellent Adhesion Resistance
 - Top rake face of the insert is lapped finish.
 - DLC Coat inserts are available for improved adhesion resistance.

Ramping (Slant Milling)

Maximum ramping angle (RMPX) 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:

$$L = \frac{a_p}{\tan RMPX} \text{ (mm)}$$



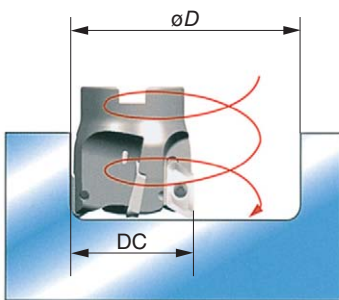
Ramping (Slant Milling) Angles

Diameter DC(mm)	Max. Ramping Angle RMPX	
	WAX3000 Type	WAX4000 Type
20	28°	
25	17°	26°
32	12°	1830'
40	9°	13°
50	7°	930'
63	5°	7°
80	3°	5°
100	3°	4°
125	2°	3°

Helical Milling Diameter

Diameter DC(mm)	WAX3000 Type		WAX4000 Type	
	Min. Diameter	Max. Diameter	Min. Diameter	Max. Diameter
20	22	33		
25	29	43	27	43
32	43	57	38	57
40	59	73	54	73
50	79	93	74	93
63	105	119	100	119
80	139	153	134	153
100	179	193	174	193
125	229	243	224	243

Helical Milling



Maximum Allowable Spindle Speed

Cutter Diameter DC(mm)	WAX3000 Type		WAX4000 Type	
	n max (min ⁻¹)	v_c (m/min)	n max (min ⁻¹)	v_c (m/min)
20	14,000	880		
25	29,000	2,200	11,000	860
32	25,000	2,500	9,000	900
40	23,000	2,900	20,000	2,500
50	20,000	3,100	18,000	2,800
63	18,000	3,500	16,000	3,100
80	16,000	4,000	14,000	3,500
100	14,000	4,400	12,000	3,700
125	13,000	5,100	11,000	4,300

The n max speeds are set to prevent the inserts from dislodging by centrifugal forces.

Recommended Cutting Conditions

ISO	Work Material	Hardness	Cutting Speed v_c (m/min)	Feed Rate f_z (mm/t)	Grade
			Min. - Optimum -Max.	Min. - Optimum -Max.	
N	Aluminum Alloy	—	600-900-1200	0.05-0.15-0.25	DL1000

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

Milling Cutters

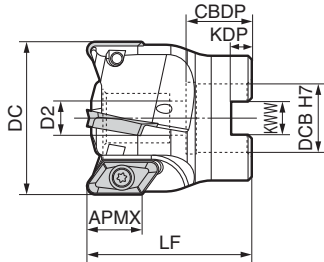
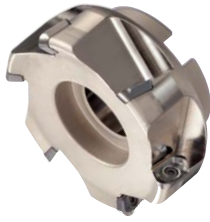
Face Milling
 Shoulder Milling
 High Feed
 Radius
 Multi-Purpose
 R/Profiling
 Groove/T-Slot
 Chamfering
 Aluminum/Light Alloys
 High-Speed Cast Iron

WAX 3000 Type

Rake Angle	Radial	6°
	Axial	19° to 25°



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



See insert table for "APMX".

Body (For RE=3.2 and below) Dimensions (mm)

Metric	Cat. No.	Stock	Diameter		Total Length	Bolt	Grooving Width	Grooving Depth	Mounting Depth	No. of Teeth	Weight (kg)
			DC	DCB							
Metric	WAX 3050-3.2	●	50	22	50	11	10.4	6.3	21	4	0.34
	3063-3.2	●	63	22	50	11	10.4	6.3	21	5	0.6
Inch	WAX 3080-3.2	●	80	25.4	50	14	9.5	6	25	5	1.0
	3100-3.2	●	100	31.75	63	17	12.7	8	32	6	2.2
	3125-3.2	●	125	38.1	63	21	15.9	10	35	7	3.5

Body (For RE=4.0 and above) Dimensions (mm)

Metric	Cat. No.	Stock	Diameter		Total Length	Bolt	Grooving Width	Grooving Depth	Mounting Depth	No. of Teeth	Weight (kg)
			DC	DCB							
Metric	WAX 3050-4.0	●	50	22	50	11	10.4	6.3	21	4	0.34
	3063-4.0	●	63	22	50	11	10.4	6.3	21	4	0.6
Inch	WAX 3080-4.0	●	80	25.4	50	14	9.5	6	25	5	1.0
	3100-4.0	●	100	31.75	63	17	12.7	8	32	6	2.2
	3125-4.0	●	125	38.1	63	21	15.9	10	35	7	3.5

Inserts are not included.

Parts (3000 Type common)

Screw	Wrench	Anti-seizure Cream	
			Applicable Endmill
BFTX0408	3.0	TRD15	WAX3000 Type WAX3000E / EL Type

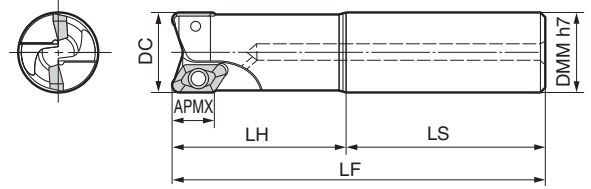
Recommended Tightening Torque (N·m)

WAX 3000E / 3000EL Type

Rake Angle	Radial	6°
	Axial	19° to 25°



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



See insert table for "APMX".

Body (For RE=3.2 and below) Dimensions (mm)

Metric	Cat. No.	Stock	Diameter		Total Length	Head	Shank	No. of Teeth	Weight (kg)
			DC	DMM					
Metric	WAX 3020E -3.2	●	20	20	130	60	70	1	0.25
	WAX 3025E -3.2	●	25	25	140	60	80	2	0.42
Inch	3025EL-3.2	●	25	25	200	60	140	2	0.63
	3032E -3.2	●	32	32	150	70	80	2	0.75
	3032EL-3.2	●	32	32	220	70	150	2	1.2
Inch	WAX 3040E -3.2	●	40	32	160	70	90	3	1.0
	3040EL-3.2	●	40	32	220	70	150	3	1.4

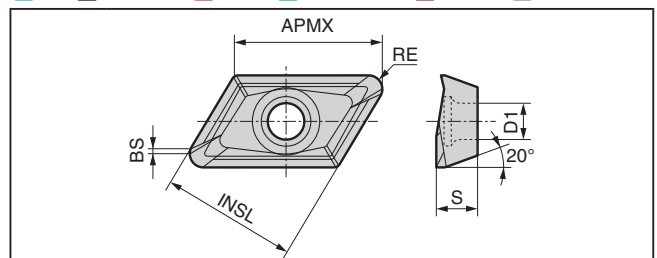
Body (For RE=4.0 and above) Dimensions (mm)

Metric	Cat. No.	Stock	Diameter		Total Length	Head	Shank	No. of Teeth	Weight (kg)
			DC	DMM					
Metric	WAX 3020E -4.0	●	20	20	130	60	70	1	0.25
	WAX 3025E -4.0	●	25	25	140	60	80	2	0.42
Inch	3025EL-4.0	●	25	25	200	60	140	2	0.63
	3032E -4.0	●	32	32	150	70	80	2	0.75
	3032EL-4.0	●	32	32	220	70	150	2	1.2
Inch	WAX 3040E -4.0	●	40	32	160	70	90	3	1.0
	3040EL-4.0	●	40	32	220	70	150	3	1.4

Inserts are not included.

Inserts (3000 Type common)

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

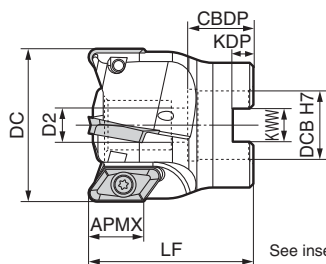


Application	Grade	Carbide	DLC	Dimensions (mm)						
				Max. Depth of Cut	Length	Wiper	Corner Radius	Thickness	Hole Size	
High Speed/Light	General Purpose	N	N	APMX	INSL	BS	RE	S	D1	
										DL1000
Roughing	N	N	N	APMX	INSL	BS	RE	S	D1	
										H1
Cat. No.										
AECT 160404PEFRA	●	●	18	16.4	1.4	0.4	5	4.4		
160408PEFRA	●	●	18	16.4	1.0	0.8	5	4.4		
160412PEFRA	●	●	18	16.4	0.6	1.2	5	4.4		
160416PEFRA	●	●	17.5	16.4	0.5	1.6	5	4.4		
160420PEFRA	●	●	17.5	16.4	0.5	2.0	5	4.4		
160430PEFRA	●	●	17	16.4	0.7	3.0	5	4.4		
160432PEFRA	●	●	17	16.4	0.5	3.2	5	4.4		
AECT 160440PEFRA	●	●	16.5	16.4	0.5	4.0	5	4.4		
160450PEFRA	●	●	16	16.4	0.4	5.0	5	4.4		

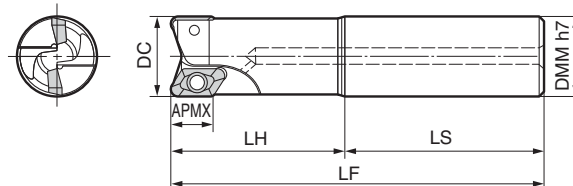
r_e = 4.0 or greater are for use with bodies that have a -4.0 cat. no. suffix.

WAX 4000 Type

WAX 4000E / 4000EL Type



See insert table for "APMX".



See insert table for "APMX".

Body (For RE=3.2 and below) Dimensions (mm)

	Cat. No.	Stock	Diameter		Total Length	Bolt	Grooving Width	Grooving Depth	Mounting Depth	No. of Teeth	Weight (kg)
			DC	DCB							
Metric	WAX 4050-3.2	●	50	16	50	9	8.4	5.6	18	2	0.37
	4063-3.2	●	63	22	50	11	10.4	6.3	21	3	0.54
Inch	WAX 4080-3.2	●	80	25.4	50	14	9.5	6	25	4	0.81
	4100-3.2	●	100	31.75	63	17	12.7	8	32	5	1.7
	4125-3.2	●	125	38.1	63	21	15.9	10	35	6	2.6

Body (For RE=3.2 and below) Dimensions (mm)

	Cat. No.	Stock	Diameter	Shank	Total Length	Head	Shank	No. of Teeth	Weight (kg)
Metric	WAX 4025E -3.2	●	25	25	140	60	80	1	0.41
	4025EL-3.2	●	25	25	200	60	140	1	0.63
Inch	4032E -3.2	●	32	32	150	70	80	1	0.72
	4032EL-3.2	●	32	32	220	70	150	1	1.2
Metric	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 RE=4.0 and above) Dimensions (mm)

	Cat. No.	Stock	Diameter		Total Length	Bolt	Grooving Width	Grooving Depth	Mounting Depth	No. of Teeth	Weight (kg)
			DC	DCB							
Metric	WAX 4050-4.0	●	50	16	50	9	8.4	5.6	18	2	0.37
	4063-4.0	●	63	22	50	11	10.4	6.3	21	3	0.54
Inch	WAX 4080-4.0	●	80	25.4	50	14	9.5	6	25	4	0.81
	4100-4.0	●	100	31.75	63	17	12.7	8	32	5	1.7
	4125-4.0	●	125	38.1	63	21	15.9	10	35	6	2.6

Inserts are not included.

Body (For RE=4.0 and above) Dimensions (mm)

	Cat. No.	Stock	Diameter	Shank	Total Length	Head	Shank	No. of Teeth	Weight (kg)
Metric	WAX 4025E -4.0	●	25	25	140	60	80	1	0.41
	4025EL-4.0	●	25	25	200	60	140	1	0.63
Inch	4032E -4.0	●	32	32	150	70	80	1	0.72
	4032EL-4.0	●	32	32	220	70	150	1	1.2
Metric	WAX 4040E -4.0	●	40	32	160	70	90	2	0.88
	4040EL-4.0	●	40	32	220	70	150	2	1.2

Inserts are not included.

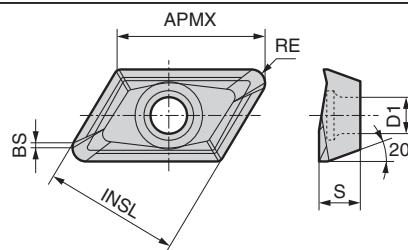
Parts (4000 Type common)

Screw	Wrench	Anti-seizure Cream	Applicable Endmill
BFTX0509N 5.0	TRD20	SUMI-P	
BFTX0511N 5.0	TRD20	SUMI-P	ø40 to ø125

Recommended Tightening Torque (N·m)

Inserts (4000 Type common)

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



Grade	Carbide		DLC		Dimensions (mm)								
	High Speed/Light	General Purpose	High Speed/Light	General Purpose	Cat. No.	H	DL1000	Max. Depth of Cut	Length	Wiper	Corner Radius	Thickness	Hole Size
Application	High Speed/Light		High Speed/Light		AECT 220604PEFRA	●	●	24	21.8	1.5	0.4	6.35	6.0
	General Purpose		General Purpose										
Application	General Purpose		General Purpose		AECT 220612PEFRA	●	●	24	21.8	0.8	1.2	6.35	6.0
	Roughing		Roughing		AECT 220616PEFRA	●	●	24	21.8	0.4	1.6	6.35	6.0
Application	High Speed/Light		High Speed/Light		AECT 220620PEFRA	●	●	24	21.8	0.5	2.0	6.35	6.0
	General Purpose		General Purpose		AECT 220630PEFRA	●	●	23	21.8	0.6	3.0	6.35	6.0
Application	High Speed/Light		High Speed/Light		AECT 220632PEFRA	●	●	23	21.8	0.4	3.2	6.35	6.0
	General Purpose		General Purpose		AECT 220640PEFRA	●	●	22	21.8	1.2	4.0	6.35	6.0
Application	High Speed/Light		High Speed/Light		AECT 220650PEFRA	●	●	22	21.8	0.4	5.0	6.35	6.0
	General Purpose		General Purpose										

$r_e = 4.0$ or greater are for use with bodies that have a -4.0 cat. no. suffix.