



Sensation of high speed aluminum machining

Pro-X Mill

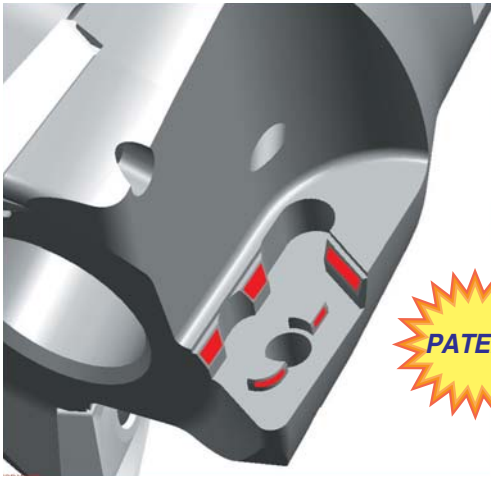


Feature

- Multi-dimension clamping system
: strong clamping force in high speed operation.
- Buffed top face
: Decreasing built-up edge & excellent chip evacuation.
- High rake angle of cutting edge
: Low cutting resistance.
- Rigid alloy steel body for ideal & stable high speed operation.
- Multi-functional aluminum milling tool.
: Shouldering, slotting, helical ramping and copying operation available.

Pro-X Mill

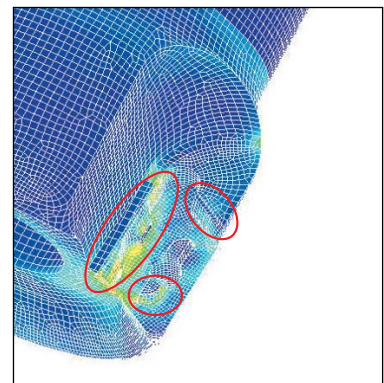
Features of Pro-X Mill



► **Multi-dimension strong clamping system for high speed**

- Multi-dimensional clamping face at bottom of insert and tip seat creates strong clamping force
- Adjustment of all factors which cause chattering

► **Calculating stress distribution by FEM (Finite Element Method) on clamping system designing**



► **Coolant system**

- Better chip scattering in high speed operation
- Higher reliability in high speed machining
- Coolant oil and air blow action

► **Strong cutter body**

- Rigid alloy steel body + nickel coating

Features of Pro-X Mill insert

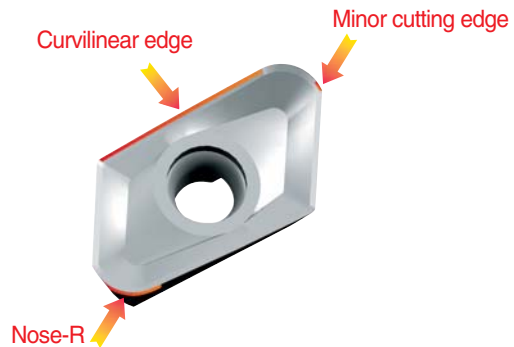
► **3 dimensional chip breaker**

- Minor cutting edge design for excellent surface roughness
- Optimal chip breaker design for low cutting resistance
- Curvilinear edge for good chip flow
- Edge design for 90° shouldering

► **Buffed mirror face to prevent built-up edge**

► **High rake angle (19°~25°)**

► **Various nose-R size**



Nose-R (ISO code)	04	08	12	16	18	20	30	32	40	50
Nose-R (ASA code)	1	2	3	4	4.5	5	7.5	8	10	12.5

Maximum RPM as per diameter



► **Laser marking information**

- Designation
- Max. RPM

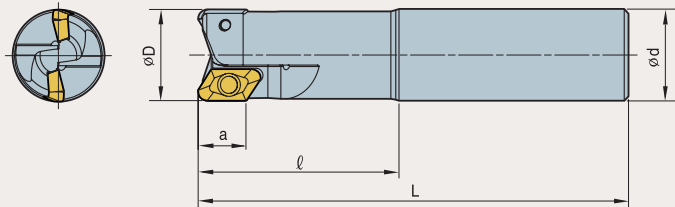
Diameter (mm)	20	25	32	40	50	63	80	100	125
Max. Vc (m/min)	2292	2559	2893	3240	3611	4055	4571	5118	5730
Max. RPM	36500	32600	28800	25800	23000	20500	18200	16300	14600
Diameter (inch)	3/4	1	1 1/4	1 5/8	2	2 1/2	3 1/4	4	5
Max. Vc (sfm)	7564	8445	9549	10693	11916	13382	15087	16890	18910

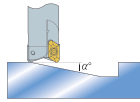
※This data is based on the separation of insert from cutter under high R.P.M. (without machining)
Safety counterplan will be required for big volume of scattering chips or unexpected breakage of tool.

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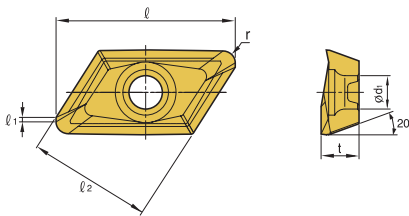
PAXS



Designation	Dimension(mm)						 α° (max)	Coolant hole	Stock
	$\varnothing D$	$\varnothing d$	ℓ	L	a	Tooth			
PAXS5020NR-A, B	20	20	60	130	17	1	8.30°	-	●
PAXS5025NR-A, B	25	25	60	140		2	17.95°	-	●
PAXS5032NR-A, B	32	32	70	150		2	12.6°	-	●
PAXS5040NR-A, B	40	40	70	160		3	9.91°	-	●
PAXS5020AR-A, B	20	20	60	130	17	1	8.30°	○	○
PAXS5025AR-A, B	25	25	60	140		2	17.95°	○	○
PAXS5032AR-A, B	32	32	70	150		2	12.6°	○	○
PAXS5040AR-A, B	40	40	70	160		3	9.91°	○	○

●: Stock item, ○: Under preparing for stock

INSERT



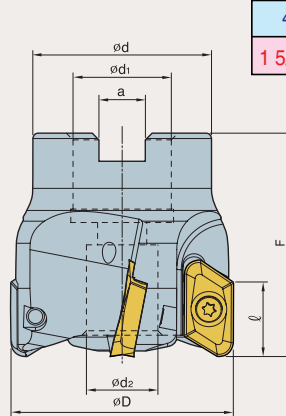
Designation	Dimension(mm)							Grade
	ℓ	ℓ_2	ℓ_1	t	r	$\varnothing d_1$	H01	
XEKT19M504FR-MA	18	16.4	1.4	5	0.4	4.4	●	
XEKT19M508FR-MA	18	16.4	1.0	5	0.8	4.4	●	
XEKT19M512FR-MA	18	16.4	0.6	5	1.2	4.4	●	
XEKT19M516FR-MA	17.5	16.4	0.5	5	1.6	4.4	●	
XEKT19M518FR-MA	17.5	16.4	0.5	5	1.8	4.4	○	
XEKT19M520FR-MA	17.5	16.4	0.5	5	2.0	4.4	●	
XEKT19M530FR-MA	17	16.4	0.7	5	3.0	4.4	●	
XEKT19M532FR-MA	17	16.4	0.5	5	3.2	4.4	●	
XEKT19M540FR-MA	16.5	16.4	0.5	5	4.0	4.4	●	
XEKT19M550FR-MA	16	16.4	0.4	5	5.0	4.4	●	

●: Stock item, ○: Under preparing for stock

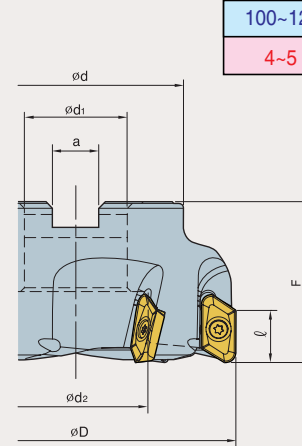
Sensation of high speed aluminum machining

Pro-X Mill

PAXC(M)



40~80 mm
1 5/8~3 1/4 inch



100~125 mm
4~5 inch

Designation	Dimension(mm)								Tooth	 $\alpha^\circ(\max)$	Coolant hole	Stock
	ϕD	ϕd_2	ϕD_1	ϕd	a	F	l					
PAXC(M)5040NR-A, B	40	14	34	15.875(16)	8.0(8.4)	40	17	3	11.31°	-	●	
PAXC(M)5050NR-A, B	50	16.5	42	22.225(22)	8.0(10.4)	50		4	7.24°	-	●	
PAXC(M)5063NR-A, B	63	16.5	49	22.225(22)	8.0(10.4)	50		5 (4)	5.10°	-	●	
PAXC(M)5080NR-A, B	80	19	57	25.4(27)	9.5(12.4)	50		5	3.86°	-	●	
PAXC(M)5100NR-A, B	100	45	67	31.75(32)	12.7(14.4)	50		6	3.94°	-	●	
PAXC(M)5125NR-A, B	125	56	87	38.1(40)	15.9(16.4)	63		7	2.14°	-	●	
PAXC(M)5040AR-A, B	40	14	34	15.875(16)	8.0(8.4)	40	17	3	11.31°	○	○	
PAXC(M)5050AR-A, B	50	16.5	42	22.225(22)	8.0(10.4)	50		4	7.24°	○	○	
PAXC(M)5063AR-A, B	63	16.5	49	22.225(22)	8.0(10.4)	50		5 (4)	5.10°	○	○	
PAXC(M)5080AR-A, B	80	19	57	25.4(27)	9.5(12.4)	50		5	3.86°	○	○	
PAXC(M)5100AR-A, B	100	45	67	31.75(32)	12.7(14.4)	50		6	3.94°	○	○	
PAXC(M)5125AR-A, B	125	56	87	38.1(40)	15.9(16.4)	63		7	2.14°	○	○	

●: Stock item, ○: Under preparing for stock

Pro-X Mill

Chip removal rate (volume) (cm³/min)

Workpiece		Diameter									Cutting condition				
		20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm	125mm	V	fz	ap	Rd	
		3/4 inch	1 inch	1 1/4 inch	1 5/8 inch	2 inch	2 1/2 inch	3 1/4 inch	4 inch	5 inch					
Aluminum alloys	Rm < 280 N/mm ²	Metric	687	1375	1375	2063	2750	3437	3437	4125	4812	1200	0.3	12	0.5D
		Inch										3960	0.012	0.48	
Copper alloys	Long Chip	Metric	101	203	203	305	407	509	509	611	713	400	0.2	8	0.5D
		Inch										1320	0.008	0.32	
Thermoplastics	-	Metric	50	100	100	150	200	250	250	300	350	350	0.15	6	0.5D
		Inch										1155	0.006	0.24	
Aluminum alloys	Si < 12%	Metric	397	795	795	1193	1591	1989	1989	2387	2785	1000	0.25	10	0.5D
		Inch										3300	0.01	0.4	
Copper alloys	Short Chip	Metric	127	254	254	381	509	636	636	763	891	500	0.2	8	0.5D
		Inch										1650	0.008	0.32	
Magnesium alloys	-	Metric	85	171	171	257	343	429	429	515	601	450	0.2	6	0.5D
		Inch										1485	0.008	0.24	
Duro plastics	-	Metric	23	47	47	71	95	119	119	143	167	200	0.15	5	0.5D
		Inch										660	0.006	0.2	

Power of machine required (Hp)

$$P_{kw} = 0.75 \times P_{hp}$$

Workpiece		Diameter									Cutting condition				
		20mm	25mm	32mm	40mm	50mm	63mm	80mm	100mm	125mm	V	fz	ap	Rd	
		3/4 inch	1 inch	1 1/4 inch	1 5/8 inch	2 inch	2 1/2 inch	3 1/4 inch	4 inch	5 inch					
Aluminum alloys	Rm < 280 N/mm ²	Metric	6.6	13.3	13.3	19.9	26.6	33.2	33.2	39.9	52.4	1200	0.3	12	0.5D
		Inch										3960	0.012	0.48	
Copper alloys	Long chip	Metric	1.2	2.4	2.4	3.7	4.9	6.2	6.2	7.4	8.7	400	0.2	8	0.5D
		Inch										1320	0.008	0.32	
Thermoplastics	-	Metric	0.6	1.2	1.2	1.8	2.4	3.0	3.0	3.6	4.3	350	0.15	6	0.5D
		Inch										1155	0.006	0.24	
Aluminum alloys	Si < 12%	Metric	4.8	9.7	9.7	14.6	19.5	24.3	24.3	29.2	34.1	1000	0.25	10	0.5D
		Inch										3300	0.01	0.4	
Copper alloys	Short Chip	Metric	1.5	3.1	3.1	4.6	6.2	7.8	7.8	9.3	10.9	500	0.2	8	0.5D
		Inch										1650	0.008	0.32	
Magnesium alloys	-	Metric	1.0	2.1	2.1	3.1	4.2	5.2	5.2	6.3	7.3	450	0.2	6	0.5D
		Inch										1485	0.008	0.24	
Duro plastics	-	Metric	0.3	0.6	0.6	0.8	1.1	1.5	1.5	1.7	2.0	200	0.15	5	0.5D
		Inch										660	0.006	0.2	

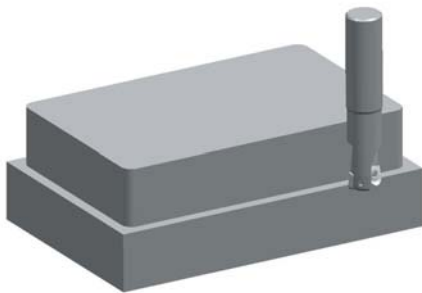
Pro-X Mill

Recommended cutting condition

Workpiece		Vc (m/min)	Vc (sfm)	f (mm/tooth)	f (ipt)
Aluminum alloys	Rm < 280 N/mm ²	1200	3960	0.3	0.012
	Rm > 280 N/mm ²	1000	3300	0.25	0.01
Copper alloys	Long chip	400	1320	0.2	0.008
Thermo plastics	-	350	1150	0.15	0.006
Aluminum alloys	Si <12%	1000	3300	0.25	0.01
	Si ≥12%	-	-	-	-
Copper alloys	Short chip	500	1650	0.2	0.008
Magnesium alloys	-	450	1480	0.2	0.008
Duroplastics	-	200	660	0.15	0.006

Application Examples

PAXS5032NR-A



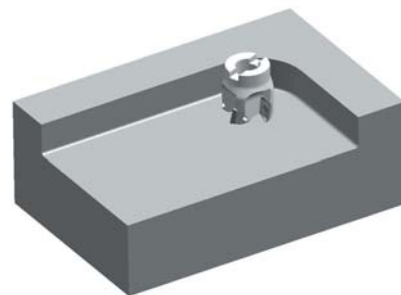
Workpiece : A6061

Cutting condition

	Vc	fz	ap	Rd
Metric	1300	0.2	8	16
Inch	4300	0.008	5/16	5/8

☞ Chip evacuation and good surface roughness

PAXCM5050NR-A



Workpiece : A6061

Cutting condition

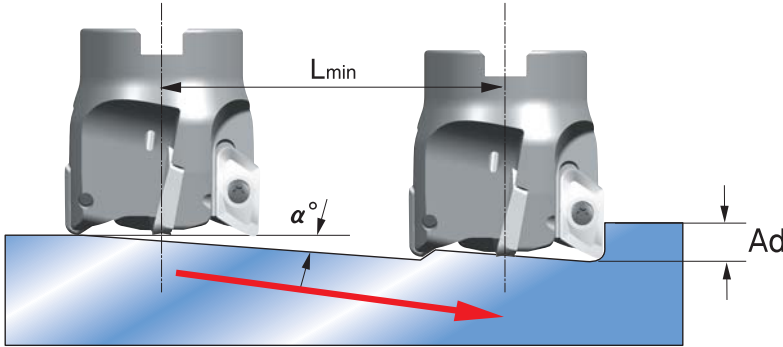
	Vc	fz	ap	Rd
Metric	1300	0.25	10	25
Inch	4300	0.01	3/8	1

☞ Long tool life and no built-up edge & chipping

Unit				
Metric	Vc(m/min)	f(mm/tooth)	(mm)	(mm)
Inch	Vc(sfm)	f(ipt)	(inch)	(inch)

Pro-X Mill

Ramping cutting technical data



$$L_{min} = \frac{Ad}{\tan \alpha^\circ} \text{ (mm)}$$

※ **L min** : minimum inclination cutting length
 α° : Max. ramping angle
 d : depth of cut

PAXC(M)5000

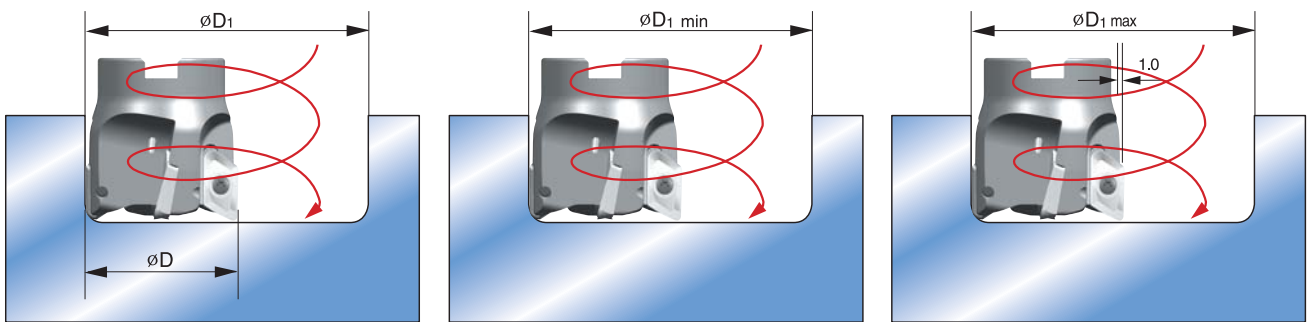
Diameter (mm)	Diameter (inch)	α° (max)	L min (mm)	L min (inch)
40	1 5/8	11.31°	50	1.97
50	2	7.24°	78	3.07
63	2 1/2	5.10°	112	4.41
80	3 1/4	3.86°	148	5.83
100	4	3.94°	145	5.71
125	5	2.14°	267	10.51

PAXS5000

Diameter (mm)	Diameter (inch)	α° (max)	L min (mm)	L min (inch)
20	3/4	8.30°	68	2.68
25	1	17.95°	31	1.22
32	1 1/4	12.6°	45	1.77
40	1 5/8	9.91°	57	2.24

※d=10mm

Helical cutting technical data



•Designation : XEKT19M532FR-MA

Unit : mm

Unit : inch

ϕ D	ϕ D ₁	ϕ D ₁ min	ϕ D ₂ max
20	29	22	33
25	39	29	43
32	53	43	57
40	69	59	73
50	89	79	93
63	115	105	119
80	149	139	153
100	189	179	193
125	239	229	243

ϕ D	ϕ D ₁	ϕ D ₁ min	ϕ D ₂ max
13/16	1 3/16	3/4	1 5/16
1	1 9/16	1 3/16	1 3/4
1 1/4	2 1/8	1 3/4	2 1/4
1 5/8	2 3/4	2 3/8	2 15/16
2	3 9/16	3 3/16	3 3/4
2 1/2	4 5/8	4 3/16	4 3/4
3 3/16	5 15/16	5 9/16	6 1/8
4	7 9/16	7 3/16	7 3/4
5	9 9/16	9 3/16	9 3/4

Sensation of high speed aluminum machining

Pro-X Mill

Pro-X Mill code system

P A X C (M) 5 0 6 3 N R - A

Pro-X Mill series

Cutter Type
C = Cutter
S = Shank

Insert I/C
50 = 19 size I/S

Coolant Hole
N = No hole type
A = Coolant hole type

Nose R
A = 0.4~3.2
B = 4.0~5.0

Metric or inch type



	φD	φd
Not shown	Metric	Inch
M	Metric	Metric
A	Inch	Inch

Cutter diameter

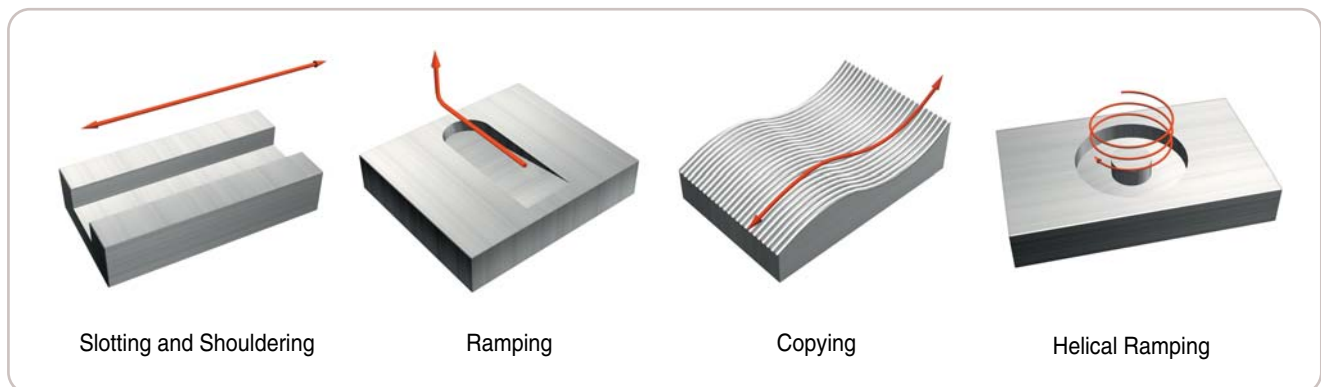
Not shown	Metric
M	63mm
A	Inch

Direction of rotation
R = Right
L = Left

Part

Screw		Wrench	
FTNA0408		TW15S	

Application



► Safety instruction

- Use safety glasses, face cover and other protection equipment. If cutting condition and use method are inaccurate, you may be injured by broken tools or scattering of chips.
- Excessive cutting load may have bad influence both tool and machine.
Make suitable tool replacement cycle for preventing failure of machining.
- After machine stopped, clean remaining chip from machine by using special cleaning equipment.
- Keep safety distances from scattering of acute and hot chip during machining.
- Make preparation to fire prevention countermeasures in advance if you use insoluble cutting oil.
- Assembled parts may be scattered at high speed cutting. Please use protection equipment.