MITSUBISHI MATERIALS

AXD Series

MULTI-FUNCTIONAL MILLING CUTTER WITH UNIQUE TECHNOLOGY FOR HIGH-SPEED AND HIGH EFFICIENCY MACHINING

TOOL NEWS **B116A**

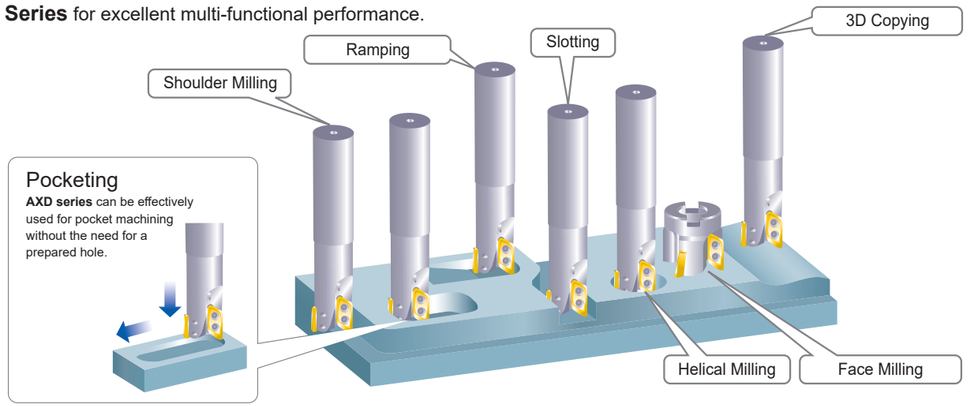
For Machining of Aluminum and Titanium Alloys

AXD Series

Features

Multi Functional Milling

AXD Series for excellent multi-functional performance.



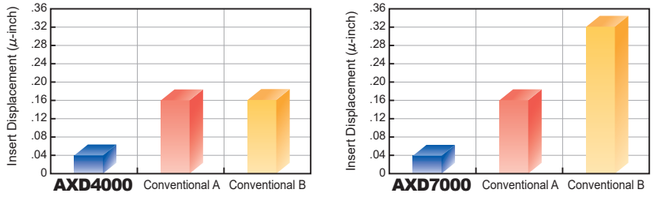
Designed for High Speed, Efficiency and Safety

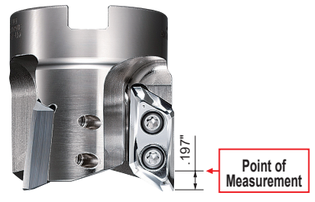
At high spindle speeds the double clamping screws prevent insert displacement caused by centrifugal force. The double clamping offers both reliability and safety.

<Cutting Conditions>
Tool : AXD4000UR0204A
AXD7000UR0203A
Insert : XDGX175008PDFR-GL
XDGX227008PDFR-GL
Spindle Speed : 20000min^{-1}
Cutting Mode : Air Cutting

Insert Displacement due to Centrifugal Force

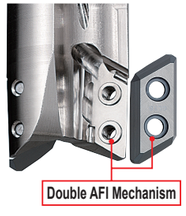
Insert displacement after air cutting





High Spindle Speeds Possible

Safe and reliable high spindle speed milling can be achieved due to the use of the double screw clamping and Mitsubishi Material's proprietary "Anti Fly Insert" mechanism (Double AFI).



High Balance Quality

To prevent vibration under high spindle speeds the holder is balanced to G6.3 or better at 10000min^{-1}, according to the ISO1940 standard. (The holder is balanced without the inserts and the screws in place)

AXD Insert Grades

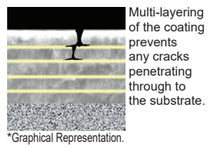
Al-Ti-Cr-N Accumulated Coating Series

MP6100/MP9100

A fusion of separate coating technologies; PVD and multi-layering provides extra toughness.

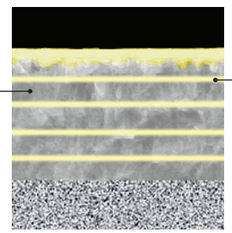
Base Layer
High Al-(Al, Ti)N

The new technology Al-(Al, Ti)N coating provides stabilisation of the high hardness phase and succeeds in dramatically improving wear, crater and welding resistance.



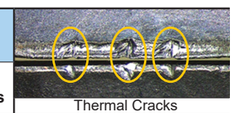
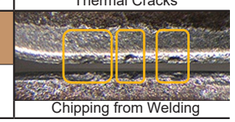
Multi-layering of the coating prevents any cracks penetrating through to the substrate.
*Graphical Representation.

Al-Ti-Cr-N Based PVD Coating



*Graphical Representation.

Ideal Layers for Different Workpiece Materials

P **MP6100**	(Al,Cr)N **Tough! Against Thermal Cracks**	 Thermal Cracks
S **MP9100**	CrN **Tough! Resistant to Chipping**	 Chipping from Welding

DLC Coated

LC15TF

DLC coating prevents the chips from welding to the rake face that provides improved surface finishes and high efficiency machining. LC15TF can be used for both wet and dry machining.

Micro-Grain Cemented Carbide

TF15

Micro-grain cemented carbide with superior resistance to wear and fracturing. TF15 ensures stable cutting and efficient machining of aluminium alloys. The special mirror treatment on the rake face prevents chip welding for reliability and longer tool life.

GM Breaker

AXD4000

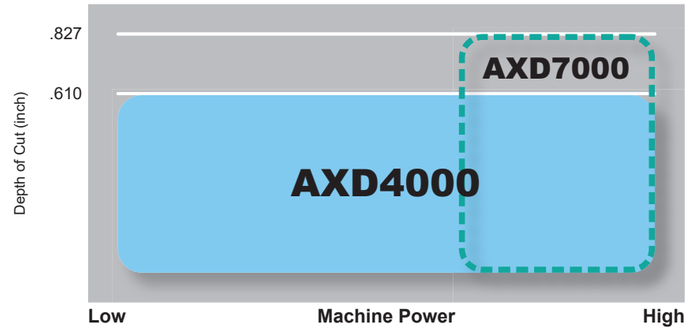
Improved fracture resistance compared to GL breaker

GL, GLA Breaker

AXD4000
AXD7000

Low cutting resistance breaker with emphasises on good sharpness

Use of AXD4000 and AXD7000



MULTI FUNCTIONAL MILLING

<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

AXD4000

P Steel | M | K | N Non-ferrous Metal | S Heat Resistant Alloy | H

Fig. 1

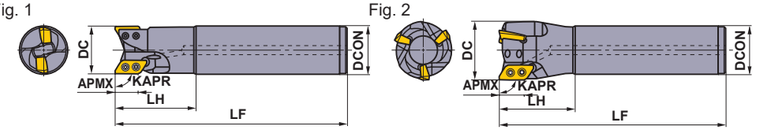


Fig. 2

Right hand tool holder only.

■ Shank Type

With Coolant Hole

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	*1 No.T	LF	LH	DCON	WT (lbs)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
1.000	A Type	.016-.125	**AXD4000UR162SA12SA**	●	2	6.000	2.000	.750	.6	.610	49000	2	XDGX1750
1.000	B Type	.157-.197	**AXD4000UR162SA12SB**	●	2	6.000	2.000	.750	.6	.583	49000	2	XDGX1750
1.000	A Type	.016-.125	**AXD4000UR162SA16SA**	●	2	6.000	2.000	1.000	1.1	.610	49000	1	XDGX1750
1.000	B Type	.157-.197	**AXD4000UR162SA16SB**	●	2	6.000	2.000	1.000	1.1	.583	49000	1	XDGX1750
1.000	A Type	.016-.125	**AXD4000UR162SA16LA**	●	2	8.500	3.000	1.000	1.6	.610	49000	1	XDGX1750
1.000	B Type	.157-.197	**AXD4000UR162SA16LB**	●	2	8.500	3.000	1.000	1.6	.583	49000	1	XDGX1750
1.250	A Type	.016-.125	**AXD4000UR202SA20SA**	●	2	6.000	2.000	1.250	1.8	.610	48000	1	XDGX1750
1.250	B Type	.157-.197	**AXD4000UR202SA20SB**	●	2	6.000	2.000	1.250	1.8	.583	48000	1	XDGX1750
1.250	A Type	.016-.125	**AXD4000UR202SA20LA**	●	2	9.000	3.500	1.250	2.7	.610	48000	1	XDGX1750
1.250	B Type	.157-.197	**AXD4000UR202SA20LB**	●	2	9.000	3.500	1.250	2.7	.583	48000	1	XDGX1750
1.500	A Type	.016-.125	**AXD4000UR243SA20SA**	●	3	6.000	2.000	1.250	1.9	.610	41000	2	XDGX1750
1.500	B Type	.157-.197	**AXD4000UR243SA20SB**	●	3	6.000	2.000	1.250	1.9	.583	41000	2	XDGX1750
1.500	A Type	.016-.125	**AXD4000UR243SA20LA**	●	3	9.000	2.000	1.250	2.9	.610	41000	2	XDGX1750
1.500	B Type	.157-.197	**AXD4000UR243SA20LB**	●	3	9.000	2.000	1.250	2.9	.583	41000	2	XDGX1750

*1 Number of Teeth

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.

Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.

Note 3) For insert with a corner radius of .063 inch and above, as corner radius increases the LF and LH dimension decreases.

Spare Parts

(inch)

* 		
Clamp Screw	Wrench	Anti-seize Lubricant
TS3SB	TKY08D	MK1KS

* Clamp Torque (lbf-in) : TS3SB=13

● : **USA Stock**

Fig. 1

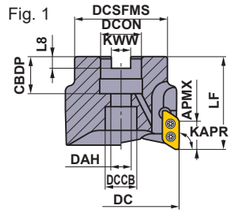
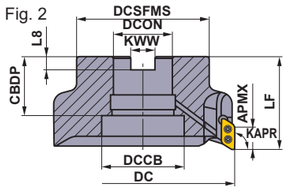
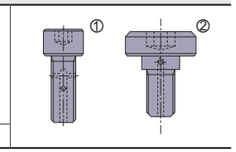


Fig. 2



Right hand tool holder only.

DC	DCON	Set Bolt	Geometry
1.500	.500	HSCU25014H	①
2.000	.750	HSCU37513H	
2.500, 3.000	1.000	HSCU50014H	
3.000	1.250	HSCU62516H	
4.000	1.500	HSCU75016H	
5.000	1.500	MBAU75016H	②



■Arbor Type

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	∗1 No.T	LF	DCON	WT (lbs)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
1.500	A Type	.016-.125	**AXD4000UR1502A**	●	2	2.000	.500	.6	.610	41000	1	XDGX1750
1.500	B Type	.157-.197	**AXD4000UR1502B**	□	2	2.000	.500	.6	.583	41000	1	XDGX1750
1.500	A Type	.016-.125	**AXD4000UR1503A**	●	3	2.000	.500	.6	.610	41000	1	XDGX1750
1.500	B Type	.157-.197	**AXD4000UR1503B**	●	3	2.000	.500	.6	.583	41000	1	XDGX1750
2.000	A Type	.016-.125	**AXD4000UR0202A**	●	2	2.000	.750	.9	.610	35000	1	XDGX1750
2.000	B Type	.157-.197	**AXD4000UR0202B**	□	2	2.000	.750	.9	.583	35000	1	XDGX1750
2.000	A Type	.016-.125	**AXD4000UR0203A**	●	3	2.000	.750	.9	.610	35000	1	XDGX1750
2.000	B Type	.157-.197	**AXD4000UR0203B**	□	3	2.000	.750	.9	.583	35000	1	XDGX1750
2.000	A Type	.016-.125	**AXD4000UR0204A**	●	4	2.000	.750	.9	.610	35000	1	XDGX1750
2.000	B Type	.157-.197	**AXD4000UR0204B**	●	4	2.000	.750	.9	.583	35000	1	XDGX1750
2.500	A Type	.016-.125	**AXD4000UR2504CA**	●	4	2.000	1.000	1.4	.610	30000	1	XDGX1750
2.500	B Type	.157-.197	**AXD4000UR2504CB**	□	4	2.000	1.000	1.4	.583	30000	1	XDGX1750
3.000	A Type	.016-.125	**AXD4000UR0303CA**	●	3	2.000	1.000	1.9	.610	27000	1	XDGX1750
3.000	B Type	.157-.197	**AXD4000UR0303CB**	●	3	2.000	1.000	1.9	.583	27000	1	XDGX1750
3.000	A Type	.016-.125	**AXD4000UR0305CA**	●	5	2.000	1.000	1.8	.610	27000	1	XDGX1750
3.000	B Type	.157-.197	**AXD4000UR0305CB**	●	5	2.000	1.000	1.8	.583	27000	1	XDGX1750
3.000	A Type	.016-.125	**AXD4000UR0303DA**	●	3	2.500	1.250	2.9	.610	27000	1	XDGX1750
3.000	B Type	.157-.197	**AXD4000UR0303DB**	□	3	2.500	1.250	2.9	.583	27000	1	XDGX1750
3.000	A Type	.016-.125	**AXD4000UR0305DA**	●	5	2.500	1.250	2.9	.610	27000	1	XDGX1750
3.000	B Type	.157-.197	**AXD4000UR0305DB**	●	5	2.500	1.250	2.9	.583	27000	1	XDGX1750
4.000	A Type	.016-.125	**AXD4000UR0404EA**	●	4	2.500	1.500	5.5	.610	23000	1	XDGX1750
4.000	B Type	.157-.197	**AXD4000UR0404EB**	□	4	2.500	1.500	5.5	.583	23000	1	XDGX1750
4.000	A Type	.016-.125	**AXD4000UR0406EA**	●	6	2.500	1.500	5.5	.610	23000	1	XDGX1750
4.000	B Type	.157-.197	**AXD4000UR0406EB**	□	6	2.500	1.500	5.5	.583	23000	1	XDGX1750
5.000	A Type	.016-.125	**AXD4000UR0505EA**	●	5	2.500	1.500	6.7	.610	20000	2	XDGX1750
5.000	B Type	.157-.197	**AXD4000UR0505EB**	□	5	2.500	1.500	6.7	.583	20000	2	XDGX1750
5.000	A Type	.016-.125	**AXD4000UR0507EA**	●	7	2.500	1.500	6.7	.610	20000	2	XDGX1750
5.000	B Type	.157-.197	**AXD4000UR0507EB**	□	7	2.500	1.500	6.7	.583	20000	2	XDGX1750

∗1 Number of Teeth
Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 3) For insert with a corner radius of .063 inch and above, as corner radius increases the LF and LH dimension decreases.

● : USA Stock □ : Made to Order

Mounting Dimensions

(inch)

DC	Cutter Body Type	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
1.500	**AXD4000UR150_A**	.500	.630	.276	.433	.500	1.440	.250	.156	1
1.500	**AXD4000UR150_B**	.500	.630	.276	.433	.465	1.440	.250	.156	1
2.000	**AXD4000UR020_A**	.750	.748	.413	.433	.582	1.750	.313	.187	1
2.000	**AXD4000UR020_B**	.750	.748	.413	.433	.548	1.750	.313	.187	1
2.500	**AXD4000UR25_CA**	1.000	.984	.539	.787	.622	2.190	.375	.219	1
2.500	**AXD4000UR25_CB**	1.000	.984	.539	.787	.587	2.190	.375	.219	1
3.000	**AXD4000UR03_CA**	1.000	.945	.539	.787	.661	2.190	.375	.219	1
3.000	**AXD4000UR03_CB**	1.000	.945	.539	.787	.627	2.190	.375	.219	1
3.000	**AXD4000UR03_DA**	1.250	1.260	.669	1.024	.767	2.880	.500	.281	1
3.000	**AXD4000UR03_DB**	1.250	1.260	.669	1.024	.733	2.880	.500	.281	1
4.000	**AXD4000UR04_EA**	1.500	1.181	.787	1.181	.925	3.810	.625	.375	1
4.000	**AXD4000UR04_EB**	1.500	1.181	.787	1.181	.891	3.810	.625	.375	1
5.000	**AXD4000UR05_EA**	1.500	1.575	—	2.205	.846	3.810	.625	.375	2
5.000	**AXD4000UR05_EB**	1.500	1.575	—	2.205	.812	3.810	.625	.375	2

Spare Parts

(inch)

∗		
		
Clamp Screw	Wrench	Anti-seize Lubricant
TS3SB	TKY08D	MK1KS

∗ Clamp Torque (lbf-in) : TS3SB=13

MULTI FUNCTIONAL MILLING

<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

AXD4000

P Steel | M | K | N Non-ferrous Metal | S Heat Resistant Alloy | H

Fig.1

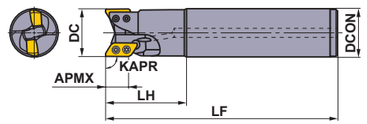
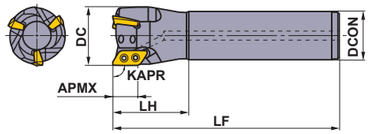


Fig.2



Right hand tool holder only.

(mm)

Metric Standard

■ Shank Type

With Coolant Hole

DC	Type	Insert Corner Radius RE	Order Number	Stock R	∗1 No.T	LF	LH	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
20	A Type	0.4-3.2	**AXD4000R201SA20SA**	★	1	110	35	20	0.22	15.5	15000	1	XDGX1750
20	B Type	4.0-5.0	**AXD4000R201SA20SB**	★	1	110	35	20	0.22	14.8	15000	1	XDGX1750
25	A Type	0.4-3.2	**AXD4000R252SA25SA**	★	2	125	50	25	0.38	15.5	49000	1	XDGX1750
25	B Type	4.0-5.0	**AXD4000R252SA25SB**	★	2	125	50	25	0.38	14.8	49000	1	XDGX1750
25	A Type	0.4-3.2	**AXD4000R252SA25LA**	★	2	170	80	25	0.53	15.5	49000	1	XDGX1750
25	B Type	4.0-5.0	**AXD4000R252SA25LB**	★	2	170	80	25	0.53	14.8	49000	1	XDGX1750
28	A Type	0.4-3.2	**AXD4000R282SA25SA**	★	2	125	50	25	0.41	15.5	48500	2	XDGX1750
28	B Type	4.0-5.0	**AXD4000R282SA25SB**	★	2	125	50	25	0.41	14.8	48500	2	XDGX1750
28	A Type	0.4-3.2	**AXD4000R282SA25ELA**	★	2	220	50	25	0.76	15.5	48500	2	XDGX1750
28	B Type	4.0-5.0	**AXD4000R282SA25ELB**	★	2	220	50	25	0.76	14.8	48500	2	XDGX1750
32	A Type	0.4-3.2	**AXD4000R322SA32SA**	★	2	150	50	32	0.80	15.5	48000	1	XDGX1750
32	B Type	4.0-5.0	**AXD4000R322SA32SB**	★	2	150	50	32	0.80	14.8	48000	1	XDGX1750
32	A Type	0.4-3.2	**AXD4000R322SA32LA**	★	2	200	80	32	1.09	15.5	48000	1	XDGX1750
32	B Type	4.0-5.0	**AXD4000R322SA32LB**	★	2	200	80	32	1.09	14.8	48000	1	XDGX1750
35	A Type	0.4-3.2	**AXD4000R352SA32SA**	★	2	150	50	32	0.84	15.5	45000	2	XDGX1750
35	B Type	4.0-5.0	**AXD4000R352SA32SB**	★	2	150	50	32	0.84	14.8	45000	2	XDGX1750
35	A Type	0.4-3.2	**AXD4000R352SA32ELA**	★	2	250	50	32	1.45	15.5	45000	2	XDGX1750
35	B Type	4.0-5.0	**AXD4000R352SA32ELB**	★	2	250	50	32	1.45	14.8	45000	2	XDGX1750
40	A Type	0.4-3.2	**AXD4000R403SA32SA**	★	3	150	50	32	0.87	15.5	41000	2	XDGX1750
40	B Type	4.0-5.0	**AXD4000R403SA32SB**	★	3	150	50	32	0.87	14.8	41000	2	XDGX1750
40	A Type	0.4-3.2	**AXD4000R403SA42SA**	★	3	170	80	42	1.53	15.5	41000	1	XDGX1750
40	B Type	4.0-5.0	**AXD4000R403SA42SB**	★	3	170	80	42	1.53	14.8	41000	1	XDGX1750
40	A Type	0.4-3.2	**AXD4000R403SA32ELA**	★	3	250	50	32	1.48	15.5	41000	2	XDGX1750
40	B Type	4.0-5.0	**AXD4000R403SA32ELB**	★	3	250	50	32	1.48	14.8	41000	2	XDGX1750

∗1 Number of Teeth

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page 28.

Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.

Note 3) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF and LH dimensions decrease.

Spare Parts

(mm)

DC	∗ Clamp Screw	Wrench	Anti-seize Lubricant
20	TS3SBS	TKY08D	MK1KS
>20	TS3SB	TKY08D	MK1KS

∗ Clamp Torque (N • m) : TS3SBS=1.5, TS3SB=1.5

★ : **Stocked in Japan**

Fig. 1

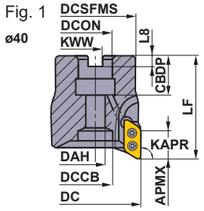


Fig. 2

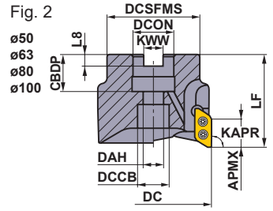
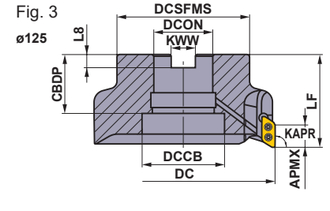
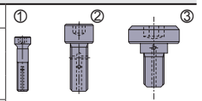


Fig. 3



Right hand tool holder only.

Cutter Diameter DC mm	Cutter Diameter DC inch	Set Bolt	Geometry
ϕ40		HFF08043H	①
ϕ50, ϕ63		HSC10030H	②
ϕ80	ϕ80	HSC12035H	②
ϕ100	ϕ100	HSC16040H	②
ϕ125	ϕ125	MBA20040H	③



With Coolant Hole

Metric Standard

For metric arbors

■ Arbor Type

DCON = inch size, With Coolant Hole

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	∗1 No.T	LF	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
80	A Type	0.4-3.2	**AXD4000R08005CA**	★	5	50	25.4	1.0	15.5	27000	2	XDGX1750
80	B Type	4.0-5.0	**AXD4000R08005CB**	★	5	50	25.4	1.0	14.8	27000	2	XDGX1750
100	A Type	0.4-3.2	**AXD4000R10006DA**	★	6	63	31.75	2.0	15.5	23000	2	XDGX1750
100	B Type	4.0-5.0	**AXD4000R10006DB**	★	6	63	31.75	2.0	14.8	23000	2	XDGX1750
125	A Type	0.4-3.2	**AXD4000R12507EA**	★	7	63	38.1	2.8	15.5	20000	3	XDGX1750
125	B Type	4.0-5.0	**AXD4000R12507EB**	★	7	63	38.1	2.8	14.8	20000	3	XDGX1750

DCON = mm size, With Coolant Hole

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	∗1 No.T	LF	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
40	A Type	0.4-3.2	**AXD4000-040A02RA**	★	2	50	16	0.3	15.5	41000	1	XDGX1750
40	B Type	4.0-5.0	**AXD4000-040A02RB**	★	2	50	16	0.3	14.8	41000	1	XDGX1750
40	A Type	0.4-3.2	**AXD4000-040A03RA**	★	3	50	16	0.3	15.5	41000	1	XDGX1750
40	B Type	4.0-5.0	**AXD4000-040A03RB**	★	3	50	16	0.3	14.8	41000	1	XDGX1750
50	A Type	0.4-3.2	**AXD4000-050A02RA**	★	2	50	22	0.4	15.5	35000	2	XDGX1750
50	B Type	4.0-5.0	**AXD4000-050A02RB**	★	2	50	22	0.4	14.8	35000	2	XDGX1750
50	A Type	0.4-3.2	**AXD4000-050A04RA**	★	4	50	22	0.4	15.5	35000	2	XDGX1750
50	B Type	4.0-5.0	**AXD4000-050A04RB**	★	4	50	22	0.4	14.8	35000	2	XDGX1750
63	A Type	0.4-3.2	**AXD4000-063A05RA**	★	5	50	22	0.6	15.5	30000	2	XDGX1750
63	B Type	4.0-5.0	**AXD4000-063A05RB**	★	5	50	22	0.6	14.8	30000	2	XDGX1750
80	A Type	0.4-3.2	**AXD4000-080A05RA**	★	5	50	27	1.0	15.5	27000	2	XDGX1750
80	B Type	4.0-5.0	**AXD4000-080A05RB**	★	5	50	27	1.0	14.8	27000	2	XDGX1750
100	A Type	0.4-3.2	**AXD4000-100A06RA**	★	6	63	32	2.0	15.5	23000	2	XDGX1750
100	B Type	4.0-5.0	**AXD4000-100A06RB**	★	6	63	32	2.0	14.8	23000	2	XDGX1750
125	A Type	0.4-3.2	**AXD4000-125B07RA**	★	7	63	40	2.8	15.5	20000	3	XDGX1750
125	B Type	4.0-5.0	**AXD4000-125B07RB**	★	7	63	40	2.8	14.8	20000	3	XDGX1750

∗1 Number of Teeth

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page 28.

Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.

Note 3) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF and LH dimensions decrease.

Mounting Dimensions

(mm)

DC	Cutter Body Type	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
40	**AXD4000-040A**	16	18	8.5	12	10.40	34	8.4	5.6	1
50	**AXD4000-050A**	22	20	11.0	17	15.99	45	10.4	6.3	2
63	**AXD4000-063A**	22	20	11.0	17	19.99	50	10.4	6.3	2
80	**AXD4000R080**	25.4	26	13.0	20	14.49	60	9.5	6.0	2
80	**AXD4000-080A**	27	23	13.0	20	14.49	60	12.4	7.0	2
100	**AXD4000R100**	31.75	32	17.0	26	18.99	70	12.7	8.0	2
100	**AXD4000-100A**	32	26	17.0	26	24.99	78	14.4	8.0	2
125	**AXD4000R125**	38.1	40	—	56	20.99	90	15.9	10.0	3
125	**AXD4000-125B**	40	40	—	56	20.99	90	16.4	9.0	3

Spare Parts

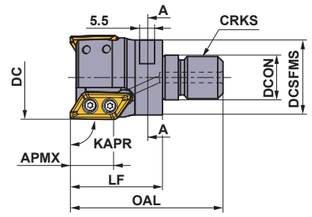
(mm)

*		
		
Clamp Screw	Wrench	Anti-seize Lubricant
TS3SB	TKY08D	MK1KS

* Clamp Torque (N • m) : TS3SB=1.5

★ : **Stocked in Japan**

Fig



A-A Section

Right hand tool holder only.

NEW

■ Screw-in Type

With Coolant Hole

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	*1 No.T	DCON	DCSFMS	OAL	LF	S10	CRKS	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Insert Type
25	A Type	0.4-3.2	**AXD4000R252AM1228A**	★	2	12.5	23.5	50	28	19	M12	0.06	15.0	49000	XDGX1750
25	B Type	4.0-5.0	**AXD4000R252AM1228B**	★	2	12.5	23.5	50	28	19	M12	0.06	14.8	49000	XDGX1750
28	A Type	0.4-3.2	**AXD4000R282AM1228A**	★	2	12.5	23.5	50	28	19	M12	0.07	15.0	48500	XDGX1750
28	B Type	4.0-5.0	**AXD4000R282AM1228B**	★	2	12.5	23.5	50	28	19	M12	0.07	14.8	48500	XDGX1750
32	A Type	0.4-3.2	**AXD4000R322AM1635A**	★	2	17.0	28.5	58	35	24	M16	0.15	15.0	48000	XDGX1750
32	B Type	4.0-5.0	**AXD4000R322AM1635B**	★	2	17.0	28.5	58	35	24	M16	0.15	14.8	48000	XDGX1750
35	A Type	0.4-3.2	**AXD4000R353AM1635A**	★	3	17.0	28.5	58	35	24	M16	0.15	15.0	41000	XDGX1750
35	B Type	4.0-5.0	**AXD4000R353AM1635B**	★	3	17.0	28.5	58	35	24	M16	0.15	14.8	41000	XDGX1750
40	A Type	0.4-3.2	**AXD4000R403AM1635A**	★	3	17.0	28.5	58	35	24	M16	0.18	15.0	38000	XDGX1750
40	B Type	4.0-5.0	**AXD4000R403AM1635B**	★	3	17.0	28.5	58	35	24	M16	0.18	14.8	38000	XDGX1750

*1 Number of Teeth

Note 1) For screw-in type arbors, refer to pages 29 to 32.

Note 2) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page 28.

Spare Parts

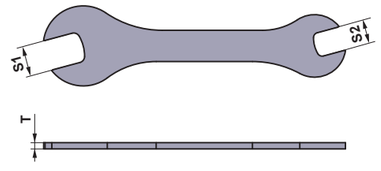
(mm)

*		
		
Clamp Screw	Wrench	Anti-seize Lubricant
TS3SB	TKY08D	MK1KS

* Clamp Torque (N • m) : TS3SB=1.5

Parts Sold Separately

Arbor Mounting Spanner



(mm)

Order Number	Dimensions		
	S1 *	S2 *	T
AKY1924050A	24	19	5

* Clamp Torque (N • m) : 19 = 80, 24 = 90

Note 1) Due to the structure of the head, it may not be possible to use a commercially available spanner to attach the arbor. It is recommended to use the dedicated spanner.

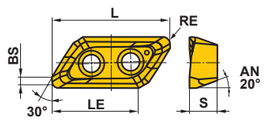
Inserts

(inch)

Workpiece Material		
P	Steel	◆
N	Aluminum Alloys	◆ ◆ ◆
S	Titanium Alloys	◆

This is the selection guideline for AXD4000.
Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.
Edge Preparation **E :** Round **F :** Sharp

Shape	Order Number	Class	Honing	Stock: Coated LC15TF	Coated MP6120	Coated MP9120	Carbide TF15	L	LE	S	BS	RE*	Geometry
GL Breaker	**XDGX175004PDFR-GL**	G	F	★			●	.906	.665	.197	.067	.016	
	XDGX175008PDFR-GL	G	F	★			●	.906	.669	.197	.051	.031	
	XDGX175012PDFR-GL	G	F	★			●	.906	.669	.197	.035	.047	
	XDGX175016PDFR-GL	G	F	★			●	.866	.646	.197	.055	.063	
	XDGX175020PDFR-GL	G	F	★			●	.866	.646	.197	.039	.079	
	XDGX175024PDFR-GL	G	F	★			●	.866	.646	.197	.024	.094	
	XDGX175030PDFR-GL	G	F	★			●	.831	.634	.197	.031	.118	
	XDGX175032PDFR-GL	G	F	★			●	.831	.634	.197	.024	.125	
	XDGX175040PDFR-GL	G	F	★			●	.787	.614	.197	.031	.157	
	XDGX175050PDFR-GL	G	F	★			●	.764	.602	.197	.016	.197	
GM Breaker	**XDGX175004PDER-GM**	G	E		●	●		.906	.669	.197	.067	.016	
	XDGX175008PDER-GM	G	E		●	●		.906	.669	.197	.051	.031	
	XDGX175012PDER-GM	G	E		●	●		.906	.669	.197	.035	.047	
	XDGX175016PDER-GM	G	E		●	●		.866	.626	.197	.055	.063	
	XDGX175020PDER-GM	G	E		●	●		.866	.626	.197	.039	.079	
	XDGX175024PDER-GM	G	E		●	●		.866	.626	.197	.024	.094	
	XDGX175030PDER-GM	G	E		●	●		.831	.630	.197	.031	.118	
	XDGX175032PDER-GM	G	E		●	●		.831	.630	.197	.024	.125	
	XDGX175040PDER-GM	G	E		●	●		.787	.583	.197	.019	.157	
	XDGX175050PDER-GM	G	E		●	●		.764	.591	.197	.016	.197	
GM Breaker	**XDGX175004PDFR-GM**	G	F				●	.906	.669	.197	.067	.016	
	XDGX175008PDFR-GM	G	F				●	.906	.669	.197	.051	.031	
	XDGX175012PDFR-GM	G	F				●	.906	.669	.197	.035	.047	
	XDGX175016PDFR-GM	G	F				●	.866	.626	.197	.055	.063	
	XDGX175020PDFR-GM	G	F				●	.866	.626	.197	.039	.079	
	XDGX175024PDFR-GM	G	F				●	.866	.626	.197	.024	.094	
	XDGX175030PDFR-GM	G	F				●	.831	.630	.197	.031	.118	
	XDGX175032PDFR-GM	G	F				●	.831	.630	.197	.024	.125	
	XDGX175040PDFR-GM	G	F				●	.787	.583	.197	.019	.157	
	XDGX175050PDFR-GM	G	F				●	.764	.591	.197	.016	.197	



* Be aware that the corner R(RE) has a different shape than the machined workpiece R.
When a GM breaker is recommended, stress the dimensional precision of the workpiece shape.

■ Holder and Insert Corner Radius Combination

Holder	A Type Holder	B Type Holder
	(Inch) AXD4000UR○○○○○○A, AXD4000UR○○○○○○○A (Metric) AXD4000–○○○○○○○A, AXD4000R○○○○○○○A	(Inch) AXD4000UR○○○○○○B, AXD4000UR○○○○○○○B (Metric) AXD4000–○○○○○○○B, AXD4000R○○○○○○○B
Insert Corner Radius (RE)	.016" XDGX175004PD□R-○○ / .031" XDGX175008PD□R-○○ / .047" XDGX175012PD□R-○○ / .063" XDGX175016PD□R-○○ / .079" XDGX175020PD□R-○○ / .094" XDGX175024PD□R-○○ / .118" XDGX175030PD□R-○○ / .125" XDGX175032PD□R-○○	.157" XDGX175040PD□R-○○ / .197" XDGX175050PD□R-○○

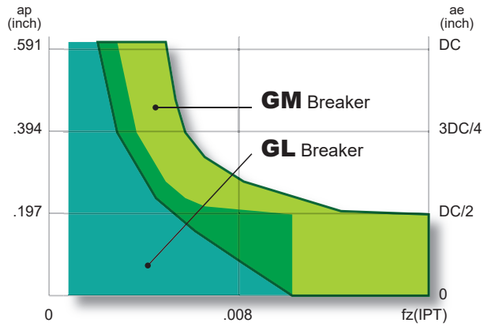
Not interchangeable with the corresponding inserts of A type and B type holders.

● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

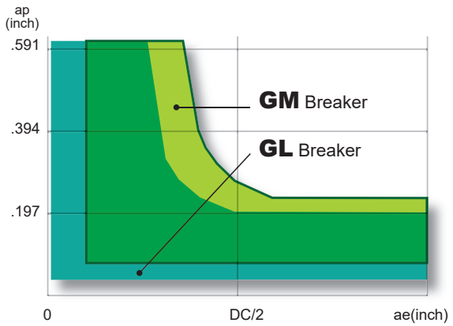
AXD4000 Selection of Insert

It is necessary to choose the best insert according to the cutting conditions. Please select an insert from the tables below.
1st recommendation for stable cutting condition is the GL breaker with a strong cutting edge.

Selection of Insert According to the Feed per Tooth and the Required Cutting Depth



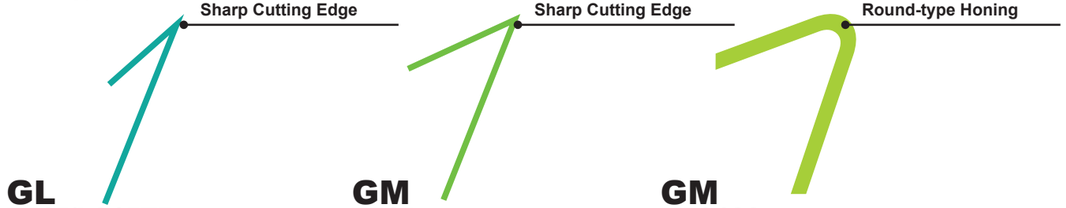
Selection of Insert According to the Width of Cut and the Required Cutting Depth



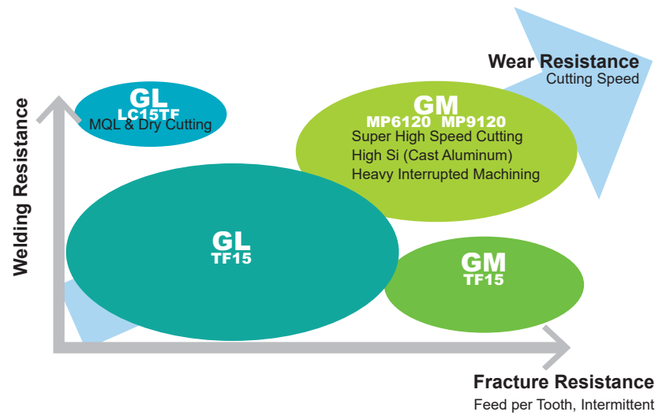
1st recommendation for machining aluminum alloys is GL breaker.
Under high-load conditions such as deep or high feed cutting, it is advisable to use the GM breaker.

Selection of Insert According to Cutting Edge

Insert Type



Selection of insert according to wear resistance



Recommended Cutting Conditions

■Cutting Speed

(inch)

Workpiece Material			Grade	Breaker	Cutting Speed **vc** (SFM)
P	Mild Steel	**≤180HB**	**MP6120**	**GM**	655 (490—720)
P	Carbon Steel Alloy Steel	**180—280HB**	**MP6120**	**GM**	655 (490—720)
N	Aluminum Alloys	**Si<5%**	**TF15** **LC15TF**	**GL**	3280 (655—9840)
N	Aluminum Alloys	**Si<5%**	**TF15** **MP9120**	**GM**	3280 (655—9840)
N	Aluminum Alloys	**5%≤Si≤10%** **Si>10%**	**MP9120**	**GM**	3280 (655—9840)
S	Titanium Alloys	—	**MP9120**	**GM**	130 (100—195)

■Feed per Tooth

(inch)

Workpiece Material			Breaker	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth (IPT) Cutting Edge Diameter **DC**					
						—	1.000"	1.250"	1.500"	2.000"—3.000"	4.000",5.000"
						20mm	25,28mm	32,35mm	40mm	50—80mm	100,125mm
P	Mild Steel	**≤180HB**	**GM**	≤ .25 DC	≤ .197	≤ .002	≤ .006	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .394	≤ .002	≤ .005	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .571	≤ .002	≤ .004	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .002	≤ .005	≤ .006	≤ .006	≤ .007	≤ .007
					≤ .394	—	≤ .004	≤ .005	≤ .005	≤ .006	≤ .006
					≤ .571	—	≤ .003	≤ .004	≤ .004	≤ .005	—
				≤ .75 DC	≤ .197	≤ .002	≤ .005	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .394	—	≤ .004	≤ .004	≤ .005	≤ .005	≤ .005
				DC (Slot)	≤ .197	≤ .002	≤ .004	≤ .005	≤ .005	≤ .006	≤ .006
	Carbon Steel Alloy Steel	**180—280HB**	**GM**	≤ .25 DC	≤ .197	≤ .002	≤ .006	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .394	≤ .002	≤ .005	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .571	≤ .002	≤ .004	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .002	≤ .005	≤ .006	≤ .006	≤ .007	≤ .007
					≤ .394	—	≤ .004	≤ .005	≤ .005	≤ .006	≤ .006
					≤ .571	—	≤ .003	≤ .004	≤ .004	≤ .005	—
				≤ .75 DC	≤ .197	≤ .002	≤ .005	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .394	—	≤ .004	≤ .004	≤ .005	≤ .005	≤ .005
				DC (Slot)	≤ .197	≤ .002	≤ .004	≤ .005	≤ .005	≤ .006	≤ .006

(Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred.
If vibrations occur make adjustments according to the machining conditions.
(Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

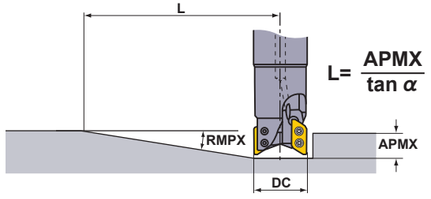
(inch)

Workpiece Material			Breaker	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth (IPT) Cutting Edge Diameter **DC**					
						—	1.000"	1.250"	1.500"	2.000"—3.000"	4.000",5.000"
						20mm	25,28mm	32,35mm	40mm	50—80mm	100,125mm
N	Aluminum Alloys	**Si<5%**	**GL**	≤ .25 DC	≤ .197	≤ .002	≤ .010	≤ .010	≤ .010	≤ .010	≤ .010
					≤ .394	≤ .002	≤ .008	≤ .008	≤ .008	≤ .008	≤ .008
					≤ .571	≤ .002	≤ .006	≤ .006	≤ .006	≤ .006	≤ .006
				≤ .5 DC	≤ .197	≤ .002	≤ .010	≤ .010	≤ .010	≤ .010	≤ .010
					≤ .394	—	≤ .008	≤ .008	≤ .008	≤ .008	≤ .008
					≤ .571	—	≤ .006	≤ .006	≤ .006	≤ .006	≤ .006
				≤ .75 DC	≤ .197	≤ .002	≤ .010	≤ .010	≤ .010	≤ .010	≤ .010
					≤ .394	—	≤ .008	≤ .008	≤ .008	≤ .008	≤ .008
					≤ .571	—	≤ .006	≤ .006	≤ .006	≤ .006	≤ .006
				DC (Slot)	≤ .197	≤ .002	≤ .010	≤ .010	≤ .010	≤ .010	≤ .010
		Si<5%	**GM**	≤ .25 DC	≤ .197	≤ .002	≤ .014	≤ .014	≤ .016	≤ .016	≤ .016
					≤ .394	≤ .002	≤ .012	≤ .012	≤ .014	≤ .014	≤ .014
					≤ .571	≤ .002	≤ .010	≤ .010	≤ .012	≤ .012	≤ .012
				≤.5 DC	≤ .197	≤ .002	≤ .014	≤ .014	≤ .014	≤ .016	≤ .016
					≤ .394	—	≤ .012	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .571	—	≤ .008	≤ .010	≤ .010	≤ .012	≤ .012
				≤ .75 DC	≤ .197	≤ .002	≤ .012	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .394	—	≤ .010	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .571	—	≤ .008	≤ .008	≤ .008	≤ .010	≤ .010
				DC (Slot)	≤ .197	≤ .002	≤ .010	≤ .010	≤ .012	≤ .014	≤ .014
		5%≤Si≤10% **Si>10%**	**GM**	≤ .25 DC	≤ .197	≤ .002	≤ .014	≤ .014	≤ .016	≤ .016	≤ .016
					≤ .394	≤ .002	≤ .012	≤ .012	≤ .014	≤ .014	≤ .014
					≤ .571	≤ .002	≤ .010	≤ .010	≤ .012	≤ .012	≤ .012
				≤ .5 DC	≤ .197	≤ .002	≤ .014	≤ .014	≤ .014	≤ .016	≤ .016
					≤ .394	—	≤ .012	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .571	—	≤ .008	≤ .010	≤ .010	≤ .012	≤ .012
				≤ .75 DC	≤ .197	≤ .002	≤ .012	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .394	—	≤ .010	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .571	—	≤ .008	≤ .008	≤ .008	≤ .010	≤ .010
				DC (Slot)	≤ .197	≤ .002	≤ .010	≤ .010	≤ .012	≤ .014	≤ .014
S	Titanium Alloys	—	**GM**	≤ .25 DC	≤ .197	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004	≤ .004
					≤ .394	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004	≤ .004
					≤ .571	≤ .002	≤ .004	≤ .004	≤ .004	≤ .004	≤ .004
				≤ .5 DC	≤ .197	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004	≤ .004
					≤ .394	—	≤ .003	≤ .004	≤ .004	≤ .004	≤ .004
					≤ .571	—	≤ .003	≤ .004	≤ .004	≤ .004	≤ .004
				≤ .75 DC	≤ .197	≤ .002	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004
					≤ .394	—	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004
					≤ .571	—	≤ .002	≤ .003	≤ .004	≤ .004	≤ .004
				DC (Slot)	≤ .197	≤ .002	≤ .002	≤ .002	≤ .002	≤ .002	≤ .002

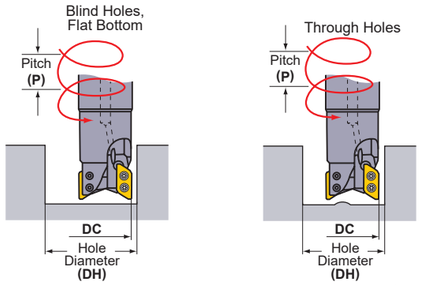
(Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred.
If vibrations occur make adjustments according to the machining conditions.
(Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When pocket machining corner radii.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low, vibrations can occur easily, if so, reduce cutting conditions such as width and depth of cut and feed per tooth.

■ Ramping / Helical Cutting (Aluminum Alloy)

Ramping



Helical Cutting



(inch)

Type	DC	RE	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			RMPX	L ✶1	DH max.	P max.	DH min.	P max.	DH min.	P max.
A Type	.787 [20mm]	.016—.047	20.7°	1.65	1.524 ✶2	.551	1.421	.551	.866	.079
		.063—.094	19.9°	1.69	1.429 ✶3	.512	1.362	.512	.866	.079
		.118—.125	18.9°	1.81	1.319 ✶4	.472	1.311	.472	.866	.039
	1.000	.016—.047	22.6°	1.50	1.949 ✶2	.551	1.832	.551	1.267	.315
		.063—.094	22.1°	1.54	1.854 ✶3	.512	1.766	.512	1.267	.315
		.118—.125	20.7°	1.65	1.728 ✶4	.472	1.707	.472	1.267	.315
	1.102 [28mm]	.016—.047	19.2°	1.77	2.154 ✶2	.551	2.047	.551	1.417	.315
		.063—.094	18.5°	1.85	2.059 ✶3	.512	1.984	.512	1.417	.315
		.118—.125	16.7°	2.05	1.949 ✶4	.472	1.925	.472	1.417	.276
	1.250	.016—.047	15.6°	2.20	2.449 ✶2	.551	2.331	.551	1.762	.433
		.063—.094	14.9°	2.32	2.354 ✶3	.512	2.264	.512	1.762	.394
		.118—.125	14.0°	2.48	2.244 ✶4	.472	2.203	.472	1.762	.394
	1.378 [35mm]	.016—.047	13.4°	2.60	2.705 ✶2	.551	2.591	.551	1.969	.433
		.063—.094	12.7°	2.71	2.610 ✶3	.512	2.531	.512	1.969	.394
		.118—.125	11.8°	2.95	2.500 ✶4	.472	2.472	.472	1.969	.354
	1.500	.016—.047	13.0°	2.68	2.933 ✶2	.551	2.827	.551	2.262	.512
		.063—.094	12.3°	2.83	2.839 ✶3	.512	2.760	.512	2.262	.512
		.118—.125	11.6°	2.99	2.728 ✶4	.472	2.701	.472	2.262	.472
	2.000	.016—.047	8.7°	4.02	3.933 ✶2	.551	3.827	.551	3.258	.551
		.063—.094	8.2°	4.25	3.839 ✶3	.512	3.757	.512	3.257	.512
		.118—.125	7.6°	4.61	3.728 ✶4	.472	3.696	.472	3.257	.472
	2.500	.016—.047	6.6°	5.28	4.933 ✶2	.551	4.824	.551	4.259	.551
		.063—.094	6.1°	5.75	4.839 ✶3	.512	4.756	.512	4.259	.512
		.118—.125	5.7°	6.14	4.728 ✶4	.472	4.695	.472	4.258	.472
	3.000	.016—.047	5.3°	6.61	5.933 ✶2	.551	5.824	.551	5.260	.551
		.063—.094	4.9°	7.13	5.839 ✶3	.512	5.756	.512	5.260	.512
		.118—.125	4.5°	7.76	5.728 ✶4	.472	5.746	.472	5.259	.472
	4.000	.016—.047	3.8°	9.21	7.933 ✶2	.551	7.824	.551	7.261	.551
		.063—.094	3.5°	10.00	7.839 ✶3	.512	7.755	.512	7.261	.512
		.118—.125	3.2°	10.94	7.728 ✶4	.472	7.694	.472	7.260	.472
	5.000	.016—.047	2.9°	12.05	9.933 ✶2	.551	9.823	.551	9.261	.551
		.063—.094	2.7°	12.95	9.839 ✶3	.512	9.755	.512	9.261	.512
		.118—.125	2.5°	14.02	9.728 ✶4	.472	9.693	.472	9.260	.472

(inch)

Type	DC	RE	Ramping		Helical Cutting (Blind Hole, Flat Bottom)				Helical Cutting (Through Hole)	
			RMPX	L ✶1	DH max.	P max.	DH min.	P max.	DH min.	P max.
B Type	.787 [20mm]	.157	17.5°	1.850	1.240	.394	1.252	.394	.866	.039
		.197	16.6°	2.795	1.161	.236	1.224	.276	.866	.039
	1.000	.157	17.9°	1.81	1.665	.394	1.635	.394	1.269	.236
		.197	14.7°	2.24	1.587	.354	1.596	.354	1.269	.197
	1.102 [28mm]	.157	14.1°	2.323	1.870	.394	1.858	.394	1.417	.236
		.197	13°	2.559	1.791	.354	1.827	.354	1.417	.197
	1.250	.157	12.9°	2.56	2.165	.394	2.130	.394	1.762	.354
		.197	12.2°	2.72	2.087	.354	2.090	.354	1.762	.315
	1.378 [35mm]	.157	10.8°	3.071	2.421	.394	2.402	.394	1.969	.315
		.197	10.2°	3.268	2.343	.354	2.370	.354	1.969	.315
	1.500	.157	10.7°	3.11	2.650	.394	2.622	.394	2.261	.394
		.197	10.1°	3.31	2.571	.354	2.583	.354	2.261	.354
	2.000	.157	6.9°	4.84	3.650	.394	3.621	.394	3.257	.394
		.197	6.5°	5.12	3.571	.354	3.580	.354	3.256	.354
	2.500	.157	5.1°	6.54	4.650	.394	4.600	.394	4.258	.394
		.197	4.8°	6.97	4.571	.354	4.578	.354	4.257	.354
	3.000	.157	4.1°	8.15	5.650	.394	5.619	.394	5.258	.394
		.197	3.8°	8.78	5.571	.354	5.578	.354	5.258	.354
	4.000	.157	2.9°	11.54	7.650	.394	7.618	.394	7.259	.394
		.197	2.7°	12.36	7.571	.354	7.577	.354	7.258	.354
	5.000	.157	2.2°	15.20	9.650	.394	9.618	.394	9.260	.394
		.197	2.1°	15.91	9.571	.354	9.577	.354	9.259	.354

The recommended ramping or helical cutting feed is .002IPT or less.

✶1. Using the maximum ramping angle, the distance to reach the maximum depth of cut is as follows: L=(maximum depth of cut APMX / tan α). Maximum depth of cut A type is .610", B type is .583".
✶2. The maximum diameter when machining a blind hole with a flat face using a corner radius of .047".
✶3. The maximum diameter when machining a blind hole with a flat face using a corner radius of .094".
✶4. The maximum diameter when machining a blind hole with a flat face using a corner radius of .125".
For other corner radius, use to following formula. {(cutting edge diameter DC) - (corner radius RE) - β} ×2

DC	β
1.0—1.25"	.010"
1.5—5.0"	.018"

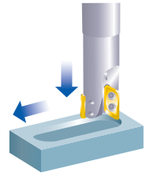
■ Max. Drilling Depth (Aluminum Alloy)

(inch)

Type	RE	Max. Drilling Depth			
		ϕ.787"	ϕ1.000"	ϕ1.250"	ϕ1.500"—ϕ5.000"
A Type	.016—.047	.209	.205	.205	.209
	.063—.094	.189	.181	.185	.189
	.118—.125	.169	.146	.165	.173
B Type	.157	.146	.106	.142	.150
	.197	.134	.091	.130	.138

The recommended drilling feed is .002 IPT or less.

AXD4000 can be effectively used for pocket machining without the need for a prepared hole.

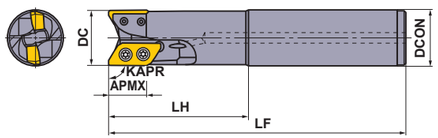


MULTI FUNCTIONAL MILLING
<CUTTING FOR ALUMINUM ALLOY>

90° KAPR

AXD7000

P	M	K	N	S	H
Steel			Non-ferrous Metal	Heat Resistant Alloy	



Right hand tool holder only.

Shank Type

With Coolant Hole

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	*1 No.T	LF	LH	DCON	WT (lbs)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
1.250	A Type	.031-.125	**AXD7000UR202SA20SA**	●	2	6.000	2.000	1.250	.6	.827	41000	1	XDGX2270
1.250	B Type	.157-.197	**AXD7000UR202SA20SB**	●	2	6.000	2.000	1.250	.6	.803	41000	1	XDGX2270
1.500	A Type	.031-.125	**AXD7000UR242SA24SA**	●	2	7.000	3.000	1.500	1.1	.827	36000	1	XDGX2270
1.500	B Type	.157-.197	**AXD7000UR242SA24SB**	●	2	7.000	3.000	1.500	1.1	.803	36000	1	XDGX2270

*1 Number of Teeth
Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page 28.
Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 3) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF and LH dimensions decrease.
Note 4) No hole for data carrier.

● : USA Stock □ : Made to Order

Fig.1

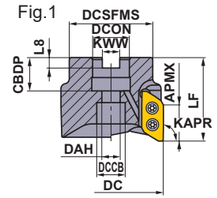
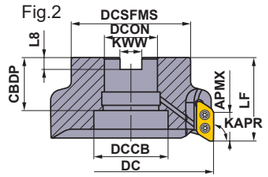
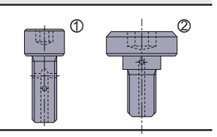


Fig.2



Right hand tool holder only.

DC	DCON	Set Bolt	Geometry
2.000	.750	HSCU37513H	①
3.000	1.250	HSCU62516H	
4.000	1.500	HSCU75016H	
5.000	1.500	MBAU75016H	②



Arbor Type

(inch)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	*1 No.T	LF	DCON	WT (ibs)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
2.000	A Type	.031-.125	**AXD7000UR0203A**	●	3	2.000	.750	.9	.827	30000	1	XDGX2270
2.000	B Type	.157-.197	**AXD7000UR0203B**	●	3	2.000	.750	.9	.803	30000	1	XDGX2270
3.000	A Type	.031-.125	**AXD7000UR0303DA**	●	3	2.500	1.250	2.6	.827	23000	1	XDGX2270
3.000	B Type	.157-.197	**AXD7000UR0303DB**	●	3	2.500	1.250	2.6	.803	23000	1	XDGX2270
4.000	A Type	.031-.125	**AXD7000UR0405EA**	●	5	2.500	1.500	5.4	.827	19000	1	XDGX2270
4.000	B Type	.157-.197	**AXD7000UR0405EB**	□	5	2.500	1.500	5.4	.803	19000	1	XDGX2270
5.000	A Type	.031-.125	**AXD7000UR0506EA**	●	6	2.500	1.500	6.6	.827	16000	2	XDGX2270
5.000	B Type	.157-.197	**AXD7000UR0506EB**	□	6	2.500	1.500	6.6	.803	16000	2	XDGX2270

*1 Number of Teeth
Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.
Note 3) For insert with a corner radius of .063 inch and above, as corner radius increases the LF and LH dimension decreases.

Mounting Dimensions

(inch)

DC	Order Number	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
2.000	**AXD7000UR0203A**	.750	.748	.415	.600	.591	1.875	.313	.187	1
2.000	**AXD7000UR0203B**	.750	.748	.415	.600	.055	1.875	.313	.187	1
3.000	**AXD7000UR0303DA**	1.250	1.260	.669	1.024	.080	2.750	.500	.281	1
3.000	**AXD7000UR0303DB**	1.250	1.260	.669	1.024	.076	2.750	.500	.281	1
4.000	**AXD7000UR0405EA**	1.500	1.181	.787	1.181	.914	3.810	.625	.375	1
4.000	**AXD7000UR0405EB**	1.500	1.181	.787	1.181	.835	3.810	.625	.375	1
5.000	**AXD7000UR0506EA**	1.500	1.575	2.205	1.181	.794	3.810	.625	.375	2
5.000	**AXD7000UR0506EB**	1.500	1.575	2.205	1.181	.873	3.810	.625	.375	2

Spare Parts

(mm)

DC	* Clamp Screw	Wrench	Anti-seize Lubricant
Shank 1.200	TS4SB	TKY15D	MK1KS
Shank 1.500 and Arbor	TS4SBL	TKY15D	MK1KS

* Clamp Torque (lbf-in) : TS4SB = 31, TS4SBL = 31

MULTI FUNCTIONAL MILLING

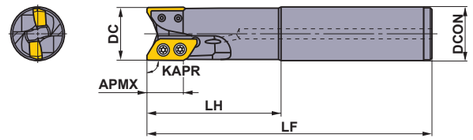
<ALUMINIUM ALLOY TO DIFFICULT-TO-CUT MATERIAL CUTTING>

90° KAPR

AXD7000

P Steel | M | K | N Non-ferrous Metal | S Heat Resistant Alloy | H

Fig.1



Metric Standard

Right hand tool holder only.

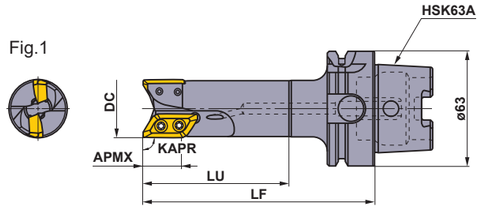
■Shank Type

With Coolant Hole

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	∗1 No.T	LF	LH	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
32	A Type	0.8-3.2	**AXD7000R322SA32SA**	★	2	170	80	32	0.85	21.0	41000	1	XDGX2270
32	B Type	4.0-5.0	**AXD7000R322SA32SB**	★	2	170	80	32	0.85	20.4	41000	1	XDGX2270
40	A Type	0.8-3.2	**AXD7000R402SA42SA**	★	2	170	80	42	1.44	21.0	36000	1	XDGX2270
40	B Type	4.0-5.0	**AXD7000R402SA42SB**	★	2	170	80	42	1.44	20.4	36000	1	XDGX2270

Fig.1



Metric Standard

Right hand tool holder only.

■HSK63A Shank Type

With Coolant Hole

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	∗1 No.T	LF	LH	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
32	A Type	0.8-3.2	**AXD7000R03202A-H63A**	★	2	127	80	1.06	21.0	41000	1	XDGX2270
40	A Type	0.8-3.2	**AXD7000R04002A-H63A**	★	2	132	85	1.34	21.0	36000	1	XDGX2270
50	A Type	0.8-3.2	**AXD7000R05003A-H63A**	★	3	137	90	2.40	21.0	30000	1	XDGX2270

∗1 Number of Teeth

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page 28.

Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.

Note 3) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF and LH dimensions decrease.

Note 4) No hole for data carrier.

Spare Parts

(mm)

DC	∗ Clamp Screw	Wrench	Anti-seize Lubricant
32	TS4SB	TKY15D	MK1KS
40, 50	TS4SBL	TKY15D	MK1KS

∗ Clamp Torque (N • m) : TS4SB=3.5, TS4SBL=3.5

★ : Stocked in Japan

Fig.1

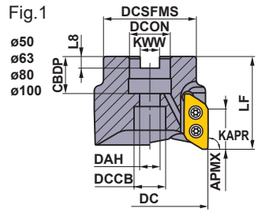
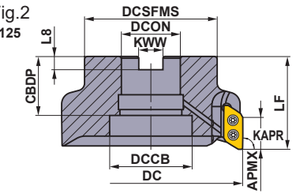


Fig.2



Right hand tool holder only.

Cutter Diameter DC mm	Cutter Diameter DC inch	Set Bolt	Geometry	
ϕ50, ϕ63		HSC10030H		① ②
ϕ80	ϕ80	HSC12035H	①	
ϕ100	ϕ100	HSC16040H		
ϕ125	ϕ125	MBA20040H	②	With Coolant Hole

Metric Standard

For metric arbors

■Arbor Type

DCON = inch size, With Coolant Hole

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	∗1 No.T	LF	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
80	A Type	0.8-3.2	**AXD7000R08004CA**	★	4	63	25.4	1.2	21.0	23000	1	XDGX2270
80	B Type	4.0-5.0	**AXD7000R08004CB**	★	4	63	25.4	1.2	20.4	23000	1	XDGX2270
100	A Type	0.8-3.2	**AXD7000R10005DA**	★	5	63	31.75	1.8	21.0	19000	1	XDGX2270
100	B Type	4.0-5.0	**AXD7000R10005DB**	★	5	63	31.75	1.8	20.4	19000	1	XDGX2270
125	A Type	0.8-3.2	**AXD7000R12506EA**	★	6	63	38.1	2.7	21.0	16000	2	XDGX2270
125	B Type	4.0-5.0	**AXD7000R12506EB**	★	6	63	38.1	2.7	20.4	16000	2	XDGX2270

DCON = mm size, With Coolant Hole

(mm)

DC	Type	Insert Corner Radius RE	Order Number	Stock R	∗1 No.T	LF	DCON	WT (kg)	APMX	Max. Spindle Speed (min^{-1})	Fig.	Insert Type
50	A Type	0.8-3.2	**AXD7000-050A03RA**	★	3	50	22	0.4	21.0	30000	1	XDGX2270
50	B Type	4.0-5.0	**AXD7000-050A03RB**	★	3	50	22	0.4	20.4	30000	1	XDGX2270
63	A Type	0.8-3.2	**AXD7000-063A03RA**	★	3	50	22	0.5	21.0	25000	1	XDGX2270
63	B Type	4.0-5.0	**AXD7000-063A03RB**	★	3	50	22	0.5	20.4	25000	1	XDGX2270
80	A Type	0.8-3.2	**AXD7000-080A04RA**	★	4	63	27	1.2	21.0	23000	1	XDGX2270
80	B Type	4.0-5.0	**AXD7000-080A04RB**	★	4	63	27	1.2	20.4	23000	1	XDGX2270
100	A Type	0.8-3.2	**AXD7000-100A05RA**	★	5	63	32	1.8	21.0	19000	1	XDGX2270
100	B Type	4.0-5.0	**AXD7000-100A05RB**	★	5	63	32	1.8	20.4	19000	1	XDGX2270
125	A Type	0.8-3.2	**AXD7000-125B06RA**	★	6	63	40	2.7	21.0	16000	2	XDGX2270
125	B Type	4.0-5.0	**AXD7000-125B06RB**	★	6	63	40	2.7	20.4	16000	2	XDGX2270

∗1 Number of Teeth

Note 1) The maximum allowable revolutions are set to ensure tool and insert stability.
Before operating the tool read the operational guidance on page 28.

Note 2) When using the tool at high spindle speeds, ensure that the tool and chuck are correctly balanced.

Note 3) Note for inserts with a corner radius of 1.6 and above, as corner radius increases the LF and LH dimensions decrease.

Mounting Dimensions

(mm)

DC	Cutter Body Type	DCON	CBDP	DAH	DCCB	LCCB	DCSFMS	KWW	L8	Fig.
50	**AXD7000-050A**	22	20	11.0	17	20.72	45	10.4	6.3	1
63	**AXD7000-063A**	22	20	11.0	17	20.72	50	10.4	6.3	1
80	**AXD7000R080**	25.4	26	13.0	20	26.72	63	9.5	6.0	1
80	**AXD7000-080A**	27	23	13.0	20	26.72	63	12.4	7.0	1
100	**AXD7000R100**	31.75	32	17.0	26	18.72	70	12.7	8.0	1
100	**AXD7000-100A**	32	26	17.0	26	24.72	70	14.4	8.0	1
125	**AXD7000R125**	38.1	40	—	56	20.72	90	15.9	10.0	2
125	**AXD7000-125B**	40	40	—	56	20.72	90	16.4	9.0	2

Spare Parts

(mm)

* 		
Clamp Screw	Wrench	Anti-seize Lubricant
TS4SBL	TKY15D	MK1KS

* Clamp Torque (N • m) : TS4SBL=3.5

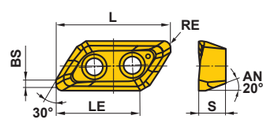
● : USA Stock ★ : Stocked in Japan
<10 inserts in one case>

Inserts

(inch)

Workpiece Material		
P	Steel	◆
N	Aluminum Alloys	◆ ◆ ◆
S	Titanium Alloys	◆

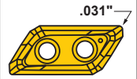
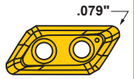
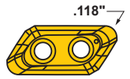
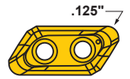
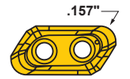
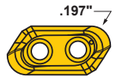
This is the selection guideline for AXD7000.
Please note that the cutting conditions differ depending on multiple factors, for more details refer to the Recommended Cutting Conditions.
Edge Preparation E : Round **F :** Sharp

Shape	Order Number	Class	Honing	Stock: Coated LC15TF	Coated MP6120	Coated MP9120	Carbide TF15	L	LE	S	BS	RE*	Geometry
	**XDGX227008PDFR-GL**	G	F	●			●	1.181	.850	.276	.079	.031	
	XDGX227016PDFR-GL	G	F	●			●	1.181	.854	.276	.047	.063	
	XDGX227020PDFR-GL	G	F	●			●	1.181	.854	.276	.031	.079	
	XDGX227024PDER-GL	G	F	●			●	1.181	.854	.276	.031	.094	
	XDGX227030PDFR-GL	G	F	●			●	1.134	.835	.276	.031	.118	
	XDGX227032PDFR-GL	G	F	●			●	1.134	.835	.276	.024	.125	
	XDGX227040PDFR-GL	G	F	●			●	1.083	.811	.276	.035	.157	
	XDGX227050PDFR-GL	G	F	●			●	1.063	.799	.276	.016	.197	
	XDGX227008PDER-GLA	G	E		●	●		1.181	.854	.276	.079	.031	
	XDGX227016PDER-GLA	G	E		●	●		1.181	.854	.276	.047	.063	
	XDGX227020PDER-GLA	G	E		●	●		1.181	.854	.276	.031	.079	
	XDGX227024PDER-GLA	G	E		●	●		1.181	.854	.276	.031	.094	
	XDGX227030PDER-GLA	G	E		●	●		1.134	.831	.276	.031	.118	
	XDGX227032PDER-GLA	G	E		●	●		1.134	.831	.276	.024	.125	
	XDGX227040PDER-GLA	G	E		●	●		1.083	.803	.276	.035	.157	
	XDGX227050PDER-GLA	G	E		●	●		1.063	.795	.276	.016	.197	

* GLA breaker corner R (RE) is designed with almost the same corner R as the machined corner R of a workpiece.
* Be aware that the corner R(RE) has a different shape than the machined workpiece R.

■Holder and Insert Corner Radius Combination

Holder	A Type Holder	B Type Holder
	(Inch) AXD7000UR□□□□□□A AXD7000UR□□□□A AXD7000UR□□□A (Metric) AXD7000R□□□□□□A AXD7000R□□□□A AXD7000R-□□□□A AXD7000R□□□□-H63A	(Inch) AXD7000UR□□□□□□B AXD7000UR□□□□B AXD7000UR□□□B (Metric) AXD7000R□□□□□□B AXD7000R□□□□B AXD7000R-□□□□□B

Insert Corner Radius (RE)	.031"	.063"	.079"	.118"	.125"	.157"	.197"
							
	XDGX 227008PD□R-G□	XDGX 227016PD□R-G□	XDGX 227020PD□R-G□	XDGX 227030PD□R-G□	XDGX 227032PD□R-G□	XDGX 227040PD□R-G□	XDGX 227050PD□R-G□

Not interchangeable with the corresponding inserts of the A type and B type holders.

Recommended Cutting Conditions

■Cutting Speed

(inch)

Workpiece Material			Grade	Breaker	Cutting Speed **vc** (SFM)
P	Mild Steel	≤180HB	MP6120	GLA	655 (490—720)
P	Carbon Steel Alloy Steel	180—280HB	MP6120	GLA	655 (490—720)
N	Aluminum Alloys	Si<5%	LC15TF	GL	3280 (655—9840)
N	Aluminum Alloys	Si<5%	TF15	GL	3280 (655—9840)
N	Aluminum Alloys	5%≤Si≤10% Si>10%	LC15TF	GL	3280 (655—9840)
S	Titanium Alloys	—	MP9120	GLA	130 (100—195)

■Feed per Tooth

(inch)

Workpiece Material			Breaker	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth (IPT) Cutting Edge Diameter **DC** 1.250" 32mm	1.500" 40mm	2.000"—3.000" 50—80mm	4.000",5.000" 100,125mm
P	Mild Steel	≤180HB	GLA	≤ .25 DC	≤ .197	≤ .007	≤ .008	≤ .008	≤ .008
					≤ .394	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .591	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .007	≤ .008	≤ .008	≤ .008
					≤ .394	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .591	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .75 DC	≤ .197	≤ .006	≤ .006	≤ .007	≤ .007
					≤ .394	≤ .005	≤ .005	≤ .006	≤ .006
					≤ .591	≤ .004	≤ .004	≤ .005	≤ .005
				DC (Slot)	≤ .197	≤ .005	≤ .006	≤ .007	≤ .007
					≤ .394	≤ .004	≤ .005	≤ .006	≤ .006
	Carbon Steel Alloy Steel	180—280HB	GLA	≤ .25 DC	≤ .197	≤ .007	≤ .008	≤ .008	≤ .008
					≤ .394	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .591	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .007	≤ .008	≤ .008	≤ .008
					≤ .394	≤ .006	≤ .007	≤ .007	≤ .007
					≤ .591	≤ .005	≤ .006	≤ .006	≤ .006
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .75 DC	≤ .197	≤ .006	≤ .006	≤ .007	≤ .007
					≤ .394	≤ .005	≤ .005	≤ .006	≤ .006
					≤ .591	≤ .004	≤ .004	≤ .005	≤ .005
				DC (Slot)	≤ .197	≤ .005	≤ .006	≤ .007	≤ .007
					≤ .394	≤ .004	≤ .005	≤ .006	≤ .006

(Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.
(Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low,vibrations can occur easily, if so, reduce the cutting conditions.
- When pocket machining corner radii.

■Feed per Tooth

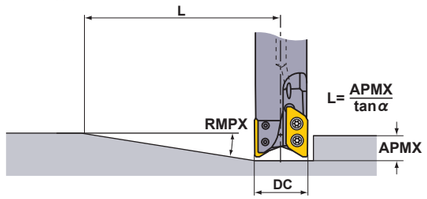
(inch)

Workpiece Material			Breaker	Cutting Width **ae**	Depth of Cut **ap**	Feed per Tooth (IPT) Cutting Edge Diameter **DC** 1.250" 32mm	1.500" 40mm	2.000"—3.000" 50—80mm	4.000",5.000" 100,125mm
N	Aluminum Alloys	Si<5%	GL	≤ .25 DC	≤ .197	≤ .014	≤ .016	≤ .016	≤ .016
					≤ .394	≤ .012	≤ .014	≤ .014	≤ .014
					≤ .591	≤ .010	≤ .012	≤ .012	≤ .012
					≤ .987	≤ .008	≤ .010	≤ .010	≤ .010
				≤ .5 DC	≤ .197	≤ .014	≤ .014	≤ .016	≤ .016
					≤ .394	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .591	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .987	≤ .008	≤ .008	≤ .010	≤ .010
				≤ .75 DC	≤ .197	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .394	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .591	≤ .008	≤ .008	≤ .010	≤ .010
					≤ .987	≤ .006	≤ .006	≤ .008	≤ .008
				DC (Slot)	≤ .197	≤ .010	≤ .012	≤ .014	≤ .014
					≤ .394	≤ .008	≤ .010	≤ .012	≤ .012
					≤ .591	≤ .006	≤ .008	≤ .010	≤ .010
					≤ .987	≤ .004	≤ .006	≤ .008	≤ .008
		5%≤Si≤10% Si>10%	GL	≤ .25 DC	≤ .197	≤ .014	≤ .016	≤ .016	≤ .016
					≤ .394	≤ .012	≤ .014	≤ .014	≤ .014
					≤ .591	≤ .010	≤ .012	≤ .012	≤ .012
					≤ .987	≤ .008	≤ .010	≤ .010	≤ .010
				≤ .5 DC	≤ .197	≤ .014	≤ .014	≤ .016	≤ .016
					≤ .394	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .591	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .987	≤ .008	≤ .008	≤ .010	≤ .010
				≤ .75 DC	≤ .197	≤ .012	≤ .012	≤ .014	≤ .014
					≤ .394	≤ .010	≤ .010	≤ .012	≤ .012
					≤ .591	≤ .008	≤ .008	≤ .010	≤ .010
					≤ .987	≤ .006	≤ .006	≤ .008	≤ .008
				DC (Slot)	≤ .197	≤ .010	≤ .012	≤ .014	≤ .014
					≤ .394	≤ .008	≤ .010	≤ .012	≤ .012
					≤ .591	≤ .006	≤ .008	≤ .010	≤ .010
					≤ .987	≤ .004	≤ .006	≤ .008	≤ .008
S	Titanium Alloys	—	GLA	≤ .25 DC	≤ .197	≤ .004	≤ .005	≤ .005	—
					≤ .394	≤ .004	≤ .005	≤ .005	—
					≤ .591	≤ .004	≤ .005	≤ .005	—
					≤ .987	≤ .004	≤ .005	≤ .005	—
				≤ .5 DC	≤ .197	≤ .004	≤ .005	≤ .005	—
					≤ .394	≤ .004	≤ .005	≤ .005	—
					≤ .591	≤ .004	≤ .005	≤ .005	—
					≤ .987	—	≤ .004	≤ .004	—
				≤ .75 DC	≤ .197	≤ .004	≤ .005	≤ .005	—
					≤ .394	≤ .004	≤ .005	≤ .005	—
					≤ .591	≤ .004	≤ .005	≤ .005	—
					≤ .987	—	≤ .004	≤ .004	—
				DC (Slot)	≤ .197	≤ .003	≤ .003	≤ .003	—
					≤ .394	≤ .002	≤ .003	≤ .003	—

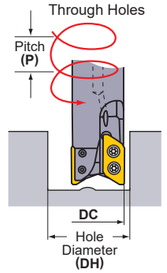
(Note 1) The above cutting conditions are determined based on high workpiece and machine rigidity, where no vibration occurred. If vibrations occur make adjustments according to the machining conditions.
(Note 2) Note, vibrations may occur in the following conditions.
- When using long tool overhang.
- When the workpiece has poor clamping rigidity or when the machine rigidity or workpiece rigidity is low,vibrations can occur easily, if so, reduce the cutting conditions.
- When pocket machining corner radii.

■ Ramping / Helical Cutting (Aluminum Alloy)

Ramping



Helical Cutting



(inch)

Type	DC	RE	Ramping		Helical Cutting	
			RMPX	L *1	DH min.	P max.
A Type	1.250	.031—.094	20°	2.272	1.535	.315
		.118,.125	19.3°	2.362	1.535	.315
	1.500	.031—.094	14.1°	3.292	2.047	.394
		.118,.125	13.3°	3.498	2.047	.394
	2.000	.031—.094	9.8°	4.788	3.031	.551
		.118,.125	9.1°	5.163	3.031	.472
	3.000	.031—.094	5.3°	8.915	5.000	.551
		.118,.125	4.9°	9.647	5.000	.512
	4.000	.031—.094	4.2°	11.262	6.969	.669
		.118,.125	3.8°	12.451	6.969	.591
	5.000	.031—.094	2.5°	18.941	9.016	.512
		.118,.125	2.2°	21.527	9.016	.472
B Type	1.250	.157, .197	18°	2.471	.157	1.535	.276
	1.500	.157, .197	11°	4.131	.197	1.535	.276
	2.000	.157, .197	8°	5.714	.157	2.047	.315
	3.000	.157, .197	4°	11.483	.197	2.047	.315
	4.000	.157, .197	3°	15.322	.157	3.031	.433
	5.000	.157, .197	2°	22.995	.197	3.031	.433
					.157	5.000	.433
					.197	5.000	.433
					.157	6.969	.472
					.197	6.969	.472
					.157	9.016	.433
					.197	9.016	.433

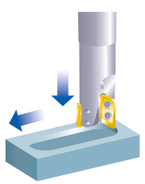
(Note) The recommended ramping feed is .002 IPT or under.
*1 L (Max. Depth of Cut =.591" / tan α). Cutters' moving distance until depth of cut reaches APMX at a maximum ramping angle.
Maximum depth of cut A type is .827", B type is .803".
*2 The maximum diameter when machining a blind hole with a flat face using a corner radius of .031" for A type and .157" for B type.
Other than that, find with the below formula.
{(cutting edge diameter DC)—(corner radius)—0.3)}×2
*3 The minimum diameter when machining a blind hole with a flat face using a corner radius of .031" for A type and .157" for B type.
Other than that, find with the below formula.
{(cutting edge diameter DC)—(corner radius)—(Width of wiper edge BS)—0.1)}×2

■ Max. Drilling Depth (Aluminum Alloy)

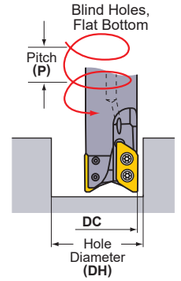
(inch)

Type	RE	Max. Drilling Depth
A Type	.031—.094	.197
	.118, .125	.177
B Type	.157	.157
	.197	.138

AXD7000 can be effectively used for pocket machining without the need for a prepared hole.



Helical Cutting



(inch)

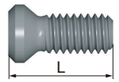
Type	DC	RE	BS	Helical Cutting (Blind Hole, Flat Bottom)			
				DH max. *2	P max.	DH min. *3	P max.
A Type	1.250"	.031	.079	2.417	.787	2.276	.787
		.063	.047	2.354	.748	2.276	.748
		.079	.031	2.323	.709	2.276	.748
		.094	.016	2.291	.709	2.276	.748
		.118	.031	2.244	.669	2.193	.669
		.125	.024	2.228	.669	2.193	.669
	1.500"	.031	.079	2.902	.787	2.776	.787
		.063	.047	2.839	.748	2.776	.748
		.079	.031	2.807	.709	2.776	.748
		.094	.016	2.776	.709	2.776	.748
		.118	.031	2.728	.669	2.693	.669
		.125	.024	2.713	.669	2.693	.669
	2.000"	.031	.079	3.902	.787	3.768	.787
		.063	.047	3.839	.748	3.768	.748
		.079	.031	3.807	.709	3.768	.748
		.094	.016	3.776	.709	3.768	.748
		.118	.031	3.728	.669	3.768	.669
		.125	.024	3.713	.669	3.687	.669
	3.000"	.031	.079	5.902	.787	5.768	.787
		.063	.047	5.839	.748	5.768	.748
		.079	.031	5.807	.709	5.768	.748
		.094	.016	5.776	.709	5.768	.748
		.118	.031	5.728	.669	5.686	.669
		.125	.024	5.713	.669	5.686	.669
	4.000"	.031	.079	7.902	.787	7.768	.787
		.063	.047	7.839	.748	7.768	.748
		.079	.031	7.807	.709	7.768	.748
		.094	.016	7.776	.709	7.768	.748
		.118	.031	7.728	.669	7.686	.669
		.125	.024	7.713	.669	7.686	.669
	5.000"	.031	.079	9.902	.669	9.767	.630
		.063	.047	9.839	.630	9.767	.630
		.079	.031	9.807	.630	9.767	.630
		.094	.016	9.776	.630	9.767	.630
		.118	.031	9.728	.551	9.685	.551
		.125	.024	9.713	.551	9.685	.551
B Type	1.250"	.157	.035	2.165	.630	2.106	.630
		.197	.016	2.087	.591	2.070	.591
	1.500"	.157	.035	2.650	.630	2.605	.630
		.197	.016	2.571	.591	2.569	.591
	2.000"	.157	.035	3.650	.630	3.599	.630
		.197	.016	3.571	.591	3.563	.591
	3.000"	.157	.035	5.650	.551	5.597	.551
		.197	.016	5.571	.551	5.561	.551
	4.000"	.157	.035	7.650	.591	7.597	.591
		.197	.016	7.571	.591	7.561	.591
	5.000"	.157	.035	9.650	.472	9.597	.472
		.197	.016	9.571	.472	9.560	.472

(Note) The recommended ramping feed is .002 IPT or under.
*1 L (Max. Depth of Cut =.591" / tan α). Cutters' moving distance until depth of cut reaches APMX at a maximum ramping angle.
Maximum depth of cut A type is .827", B type is .803".
*2 The maximum diameter when machining a blind hole with a flat face using a corner radius of .031" for A type and .157" for B type. Other than that, find with the below formula.
{(cutting edge diameter DC)—(corner radius)—0.3)}×2
*3 The minimum diameter when machining a blind hole with a flat face using a corner radius of .031" for A type and .157" for B type. Other than that, find with the below formula.
{(cutting edge diameter DC)—(corner radius)—(Width of wiper edge BS)—0.1)}×2

Operation Guidance

Only use the inserts and parts provided by Mitsubishi Materials with this tool. Use of the correct insert clamp screws is especially important to ensure overall tool safety. Do not use damaged or worn clamp screws.

Type	AXD4000		AXD7000	
Cutting Edge Diameter **DC**(inch)	ø.787"	ø1.000"–ø5.000"	ø1.250"	ø1.500"–ø5.000"
Clamp Screw Number	TS3SBS	TS3SB	TS4SB	TS4SBL
Overall Length **L**(inch)	.256	.315	.353	.413
Clamp Torque (lbf-in)	13	13	31	31



When tightening the clamp screws, follow the order in Figure 1.
The maximum allowable spindle speeds are shown in Table 1.
Ensure that the cutter operates under the maximum allowable spindle speed.
The maximum allowable spindle speeds for safety purposes are determined in accordance with ISO15641 (Milling Cutters for high speed machining–Safety requirements).

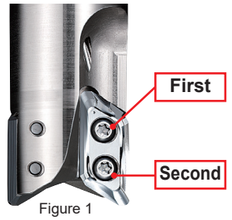


Figure 1

■Maximum Allowable Spindle Speed (min-1)

- The maximum allowable Spindle Speed listed in each table is set at the maximum balance (balance: ISO1940) accuracy of G6.3 or higher under the condition that the insert does not fly off or the body gets damaged due to centrifugal force.
- Even if the insert is used within the maximum allowable spindle speed, if the spindle speed exceeds the values listed in the table below, set the balance accuracy along with an arbor or milling chuck to G6.3 or better. It is also recommended to replace the clamp screw with a new one each time the insert is replaced.
- The balance accuracy of the AXD series is G6.3 at 10000 min-1 with just the holder alone (with no insert or clamp screw attached).
- Use a machining tool that has safety measures in place in case there is damage to the cutter body.

Maximum Allowable Spindle Speed (min-1) When Balancing With an Arbor or Milling Chuck Has Not Occurred

AXD4000

Cutting Edge Diameter **DC**(inch)	ø.787"	ø1.000"	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min-1)	15000	12000	9500	7600	6000	4800	3800	3000	2400

AXD7000

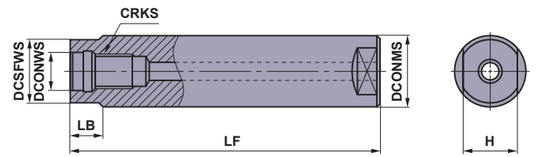
Cutting Edge Diameter **DC**(inch)	ø1.250"	ø1.500"	ø2.000"	ø2.500"	ø3.000"	ø4.000"	ø5.000"
Max. Spindle Speed (min-1)	9500	7600	6000	4800	3800	3000	2400

When setting the spindle speed, take into consideration the maximum allowable spindle speed of the arbor or milling chuck.
Use the specified set bolt when using the arbor type with through coolant.
The inserts have sharp cutting edges and handling them with bare hands may cause injuries. Always wear safety gloves when handling the indexable inserts.

● : USA Stock ★ : Stocked in Japan

SCREW-IN HOLDERS

STRAIGHT SHANK TYPE



■Steel Shank Type

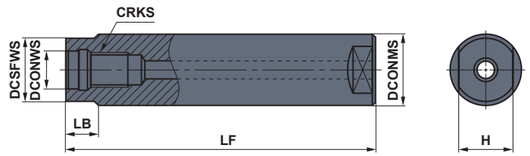
(inch)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	DCSFWS	LB	H	WT (lbs)
M12	**SCU16M12S125S**	●	1.000	4.921	.492	.925	.394	.748	.9
M12	**SCU16M12S245L**	●	1.000	9.646	.492	.925	.394	.748	2.0
M16	**SCU20M16S140S**	●	1.250	5.512	.669	1.122	.591	.945	1.8
M16	**SCU20M16S280L**	●	1.250	11.024	.669	1.122	.591	.945	3.5

Metric Standard

(mm)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	DCSFWS	LB	H	WT (kg)
M12	**SC25M12S125S**	★	25	125	12.5	23.5	10	19	0.4
M12	**SC25M12S245L**	★	25	245	12.5	23.5	10	19	0.8
M16	**SC32M16S140S**	★	32	140	17.0	28.5	15	24	0.8
M16	**SC32M16S280L**	★	32	280	17.0	28.5	15	24	1.6



■ Carbide Shank Type

(inch)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	DCSFWS	LB	H	WT (lbs)
M12	**SCU16M12S125SW**	●	1.000	4.921	.492	.925	.394	.748	1.8
M12	**SCU16M12S245LW**	●	1.000	9.646	.492	.925	.394	.748	3.5
M16	**SCU20M16S140SW**	●	1.250	5.512	.669	1.122	.591	.945	3.1
M16	**SCU20M16S280LW**	●	1.250	11.024	1.250	1.122	.591	.945	6.4

Metric Standard

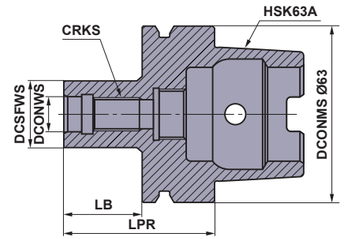
(mm)

CRKS	Order Number	Stock	DCONMS	LF	DCONWS	DCSFWS	LB	H	WT (kg)
M12	**SC25M12S125SW**	★	25	125	12.5	23.5	10	19	0.8
M12	**SC25M12S245LW**	★	25	245	12.5	23.5	10	19	1.5
M16	**SC32M16S140SW**	★	32	140	17.0	28.5	15	24	1.4
M16	**SC32M16S280LW**	★	32	280	17.0	28.5	15	24	2.8

● : USA Stock ★ : Stocked in Japan

SCREW-IN HOLDERS

■ HSK63A Shank Arbor

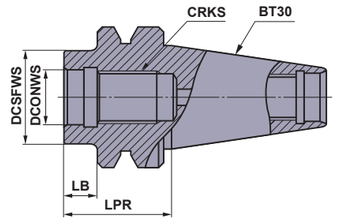


Metric Standard The coolant tube has been already set.

(mm)

CRKS	Order Number	Stock	DCONWS	DCSFWS	LPR	LB	WT (kg)
M12	**SC25M12S27-HSK63A**	★	12.5	23.5	53	27	0.7
M16	**SC32M16S28-HSK63A**	★	17.0	28.5	54	28	0.8

■ BT30 Shank Arbor

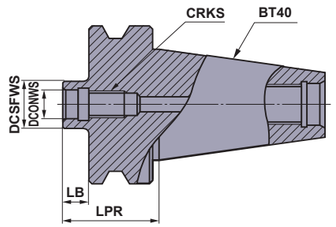


Metric Standard

(mm)

CRKS	Order Number	Stock	DCONWS	DCSFWS	LPR	LB	WT (kg)
M12	**SC25M12S10-BT30**	★	12.5	23.5	32	10	0.4
M16	**SC32M16S10-BT30**	★	17.0	28.5	32	10	0.4

■ BT40 Shank Arbor



Metric Standard

(mm)

CRKS	Order Number	Stock	DCONWS	DCSFWS	LPR	LB	WT (kg)
M12	**SC25M12S10-BT40**	★	12.5	23.5	37	10	1
M16	**SC32M16S10-BT40**	★	17.0	28.5	37	10	1

ARBORS

Arbors for Screw-in Tools

How to Install the Screw-in Head

①Thoroughly clean the clamp section of the head and the arbor with an air blower or brush before installation.

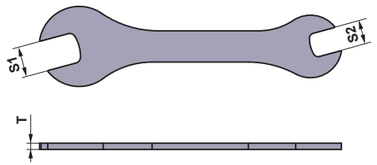
②Tighten the head at the recommended torque and ensure that there is no gap between the head and arbor.

(inch)

Screw Size	Recommended Torque (lbf-ft)	Wrench Size
M12	59.0	.748
M16	66.4	.945

- Due to the structure of the screw-in head of the AXD, it may not be possible to use a commercially available spanner to attach the arbor. It is recommended to use the dedicated spanner.
- Cutting tools become extremely hot during cutting. Never touch them with bare hands after operation as this may produce a risk of injuries or burns.

Parts Sold Separately
Arbor Mounting Spanner



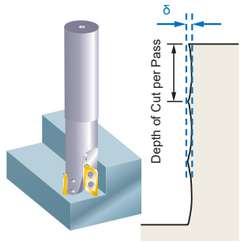
(inch)

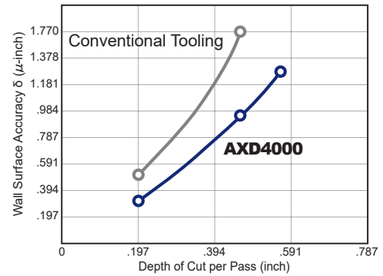
Order Number	Dimensions		
	S1 *	S2 *	T
AKY1924050A	.945	.748	.197

* Clamp Torque (lbf-ft) : =.748 = 59.0, .945 = 66.4

Excellent Wall Accuracy

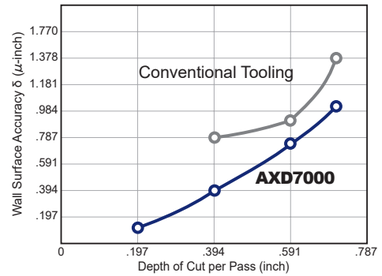
Specially designed G-class inserts with a helical cutting edge for excellent wall accuracy.





<Cutting Conditions>

Tool	: AXD4000UR243SA20SA
Insert	: XDGX175008PDFR-GL
Grade	: TF15
Workpiece Material	: Aluminum Alloy
Cutting Speed	: 3280 SFM
Feed per Tooth	: .004 IPT
Width of Cut	: .118 inch
Cutting Mode	: Wet Cutting



<Cutting Conditions>

Tool	: AXD7000UR242SA24SA
Insert	: XDGX227008PDFR-GL
Grade	: TF15
Workpiece Material	: Aluminum Alloy
Cutting Speed	: 7870 SFM
Feed per Tooth	: .004 IPT
Width of Cut	: .118 inch
Cutting Mode	: Wet Cutting

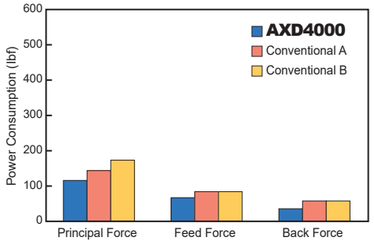
Low Resistance Inserts

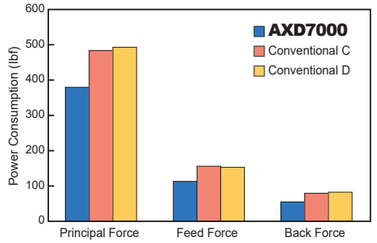
An optimised helical flank and a flank angle offer cutting edge strength and provide a large rake angle to reduce cutting resistance. Additionally a convex cutting edge is incorporated to ensure effective chip flow.

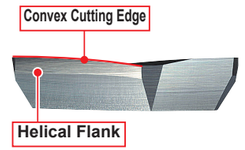
<Cutting Conditions>

Workpiece Material	: Aluminum Alloy
Tool	: DC=Ø2.000 inch
Insert	: RE=.031R, GL Breaker TF15
Cutting Speed	: vc=3280 SFM
Feed per Tooth	: .008 IPT
Depth of Cut	: ap=.984 inch
Width of Cut	: ae=.394 inch
Cutting Mode	: Wet Cutting, Single tooth

Cutting Resistance

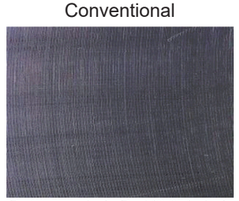






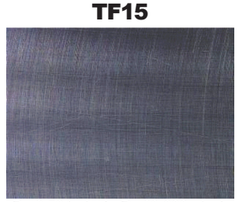
Comparison of Surface Finishes
Improved Surface Finishes by Reducing Feed Mark

Conventional



Ra 26.575μ-inch Rz 146.654μ-inch

TF15



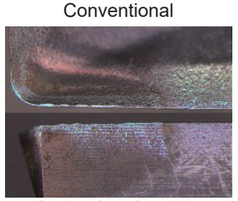
Ra 8.504μ-inch Rz 63.622μ-inch

<Cutting Conditions>

Workpiece Material	: AISI 7075	Width of Cut	: 1.181 inch
Tool	: AXD4000-050A04RA	Depth of Cut	: .020 inch
Insert	: AXD4000-GM	Cutting Mode	: Single Tooth Internal Coolant
Grade	: TF15		BT40
Cutting Speed	: 3280 SFM		
Feed per Tooth	: .006 IPT		

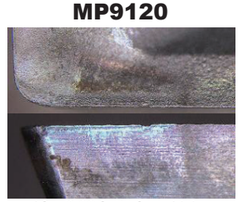
Cutting Performance on Titanium Alloy
Stable Tool Life under High-load Conditions

Conventional



After 1.31 feet of machining

MP9120



After 2.62 feet of machining

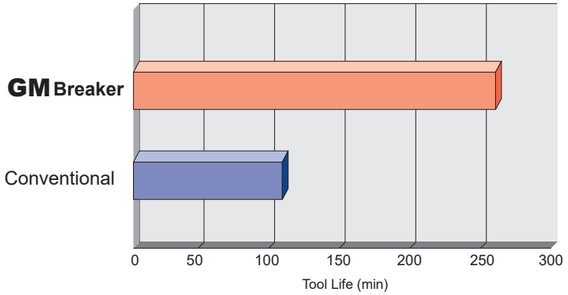
<Cutting Conditions>

Workpiece Material	: Titanium Alloy	Width of Cut	: 1.575 inch
Tool	: AXD4000-050A04RA	Depth of Cut	: .079 inch
Insert	: XDGX175004PDER-GM	Cutting Mode	: Wet (Int. and Ext.) Single Tooth
Grade	: MP9120		
Cutting Speed	: 100 SFM		
Feed per Tooth	: .004 IPT		

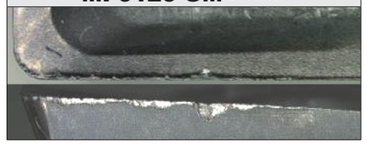
Cutting Performance

Cutting of Aluminum Alloy Cast Iron : Si Content 9%

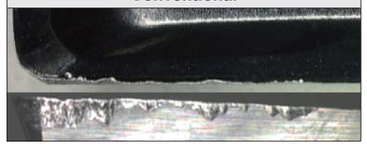
2.3 times longer tool life due to tougher cutting edge & PVD coating



MP9120 GM Breaker

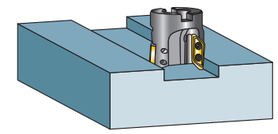
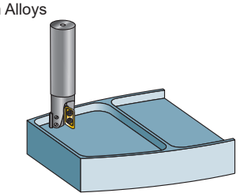


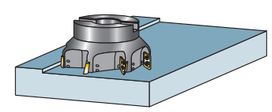
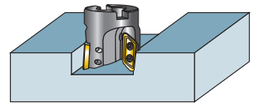
Conventional



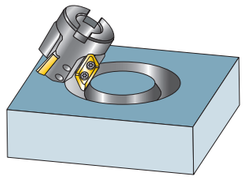
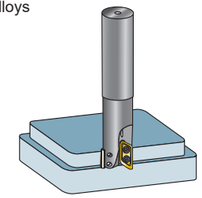
<Cutting Conditions>
Workpiece Material : Aluminum Alloy Cast Iron : Si Content 9%
Tool : AXD4000-040A02RA
Insert : XDGX175008PDER-GM
Cutting Speed : 3150 SFM
Feed : .004 IPT
Depth of Cut : ap=.236 inch ae=1.299 inch
Cutting Mode : Wet

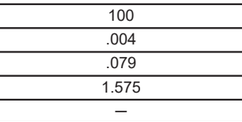
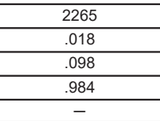
Application Examples

	Tool	AXD4000UR0202A	AXD4000UR202SA20SA
	Insert (Grade)	XDGX175030PDFR-GL(TF15)	XDGX175030PDFR-GL(TF15)
	Workpiece	Aluminum Alloys 	Aluminum Alloys 
Cutting Conditions	Spindle Speed (min^{-1})	27000	13000
	Cutting Speed (SFM)	13910	4265
	Feed per Tooth (IPT)	.011	.008
	Depth of Cut (inch)	.236	.472
	Width of Cut (inch)	1.969	.787
	Metal Removal Rate ($inch^3$/min)	282	76
	Cutting Mode	Wet	Wet
	Machine Spindle Type	M/C-HSK80F	CAT50
	Result	Although tool overhang was significant, the low cutting resistance compared with conventional products enabled stable milling.	Compared with conventional products, tool rigidity is high, obtaining an excellent surface finish.

	Tool	AXD4000R12507EA	AXD7000UR0203A
	Insert (Grade)	XDGX175008PDFR-GL(TF15)	XDGX227040PDFR-GL(TF15)
	Workpiece	Aluminum Alloys 	Aluminum Alloys 
Cutting Conditions	Spindle Speed (min^{-1})	5000	18000
	Cutting Speed (SFM)	6430	9280
	Feed per Tooth (IPT)	.012	.008
	Depth of Cut (inch)	.197	.709
	Width of Cut (inch)	3.150	1.969
	Metal Removal Rate ($inch^3$/min)	256	593
	Cutting Mode	Wet	MQL
	Machine Spindle Type	CAT50	M/C-HSK63/80A
	Result	Compared with conventional products, cutting resistance is low, and feed rate per tooth was improved by 20%.	AXD displayed lower cutting resistance and achieved a high metal removal rate of up to 593$inch^3$/min.

Please note that the machining performed in the application examples is dependent on the rigidity of the machine used and the rigidity of the workpiece and clamping.

Tool		AXD7000-050A03RA	AXD7000UR0202SA20SA
Insert (Grade)		XDGX227008PDFR-GL(TF15)	XDGX227008PDFR-GL(TF15)
Workpiece		Aluminum Alloys 	Aluminum Alloys 
Cutting Conditions	Spindle Speed (min^{-1})	12500	7950
	Cutting Speed (SFM)	6430	3280
	Feed per Tooth (IPT)	.011	.008
	Depth of Cut (inch)	.394	.394
	Width of Cut (inch)	.787	.197
	Metal Removal Rate ($inch^3$/min)	62	9.8
Cutting Mode		Wet	Wet
Machine Spindle Type		CAT50	M/C-HSK63A
Result		Clamping rigidity of the inserts was higher than a conventional product, thus allowing stable 5-axis machining.	AXD achieved excellent results with a vertical wall accuracy of under .0003inch.

Tool		AXD4000-050A04RA	AXD4000UR162SA16SA
Insert (Grade)		XDGX175008PDER-GM(MP9120)	XDGX175008PDER-GM(MP9120)
Workpiece		Titanium Alloys 	Aluminum Alloys 
Cutting Conditions	Spindle Speed (min^{-1})	190	8790
	Cutting Speed (SFM)	100	2265
	Feed per Tooth (IPT)	.004	.018
	Depth of Cut (inch)	.079	.098
	Width of Cut (inch)	1.575	.984
	Metal Removal Rate ($inch^3$/min)	—	—
Cutting Mode		Wet Internal/ External Coolant	External Coolant
Machine Spindle Type		Vertical 3 axis	CAT40
Result		AXD achieved double tool life compared to conventional products.	Aluminum alloys containing a higher amount of Silicon can wear out inserts rapidly. Using our coated inserts can improve tool life.

Please note that the machining performed in the application examples is dependent on the rigidity of the machine used and the rigidity of the workpiece and clamping.

Memo

MTEC

MACHINING TECHNOLOGY AND EDUCATION CENTER

Welcome to our new world-class Machining Technology and Education Center (MTEC) in Mooresville, NC providing year round support and services to North America.

ABOUT MTEC

TOOLING PROPOSALS & EVALUATION
We will review your current processes or outline a new process. From this review, we will improve productivity, analyze programming methods and output a solution with programming, tooling and time savings.

MACHINING SIMULATION
Using the latest CAD/CAM software and our cutting tool experience, we will outline a new process using proper machining techniques to maximize tool life and productivity.

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Dedicated local professionals to answer any of your order, product or technical questions.

TRAINING
We are excited to offer several levels of training with goals to reach our highest level--Craftsman Machining Technology. At MTEC NC, we will train using a combination of classroom and hands-on machine time to develop skills and real-world understanding of materials, tools and applications. In addition to multi-day courses, we will have Machining Technology skills seminars, as well as seminars from our partners to complement our apprentice level courses, our journeyman courses, and up to our craftsman level courses.

PROCESS IMPROVEMENTS
Review of the complete part processing and recommend changes of speed, feed, new tooling, reduction of passes, modifying programming and other solutions to reduce cycle time, save money and be proactive.

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Our FREE online webinar series is available anytime on-demand. Narrated by the MTEC training staff, you will receive in-depth knowledge of the topic. Simply register online at the link below for access. You will receive a certificate upon completion of each course.

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- Advanced Drilling
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Programs are designed for several levels of skill development – from basic understanding to advance manufacturing with digital solutions, complementing to your valued experience in CNC machining environment. Participate in machining demonstrations with Mitsubishi Materials' skilled engineers. Discover methods to reduce setup and cycle time, optimize programs and enhance your knowledge base.

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FOR YOUR SAFETY

- Don't handle inserts and chips without gloves.
- Please machine within the recommended application range and exchange expired tools with new ones in advance of breakage.
- Please use safety covers and wear safety glasses.
- When using compounded cutting oils, please take fire precautions.
- When attaching inserts or spare parts, please use only the correct wrench or driver.
- When using rotating tools, please make a trial run to check run-out, vibration and abnormal sounds etc.

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