

ALU

LINE



THE FUTURE OF PRECISION MACHINING

Superior smooth milling
ideal for aluminium alloy

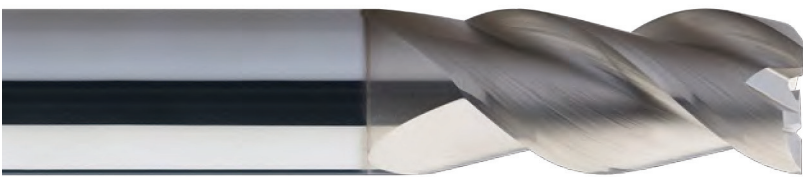


The Alu Line series was manufactured with high feed, high performance coating technology through our advanced facilities. Machine Aluminum with reduce friction and minimum build up edge. Smoothens, and trouble-free chip evacuation which leads to shorter machine downtime. This mean lower machining cost and greater productivity.

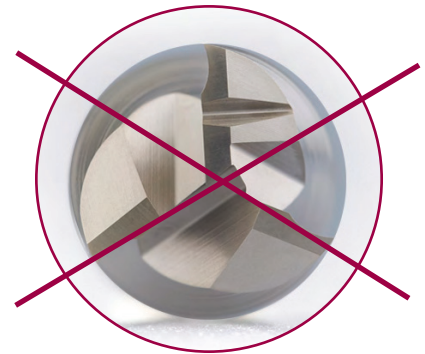
1

Differential Pitch (DP) Design Reduces Vibrations

- Maximizes productivity and tool life



End Face View



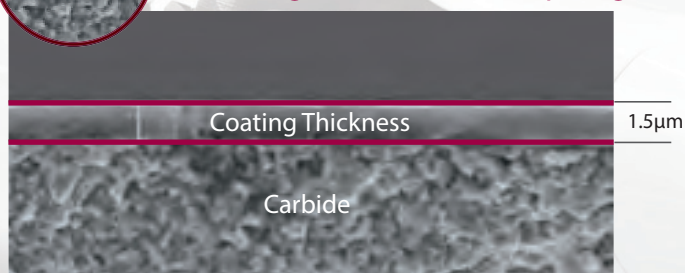
2

High Performance Coating TiB₂(Titanium DiBoride), H2600

- For non-ferrous material, e.g: **Aluminium Alloys**
- Provides superior chip flow along with extended resistance
- Higher productivity



▶ Multilayer structure with low friction coating to reduce built up edges



Picture : TiB₂ structure.

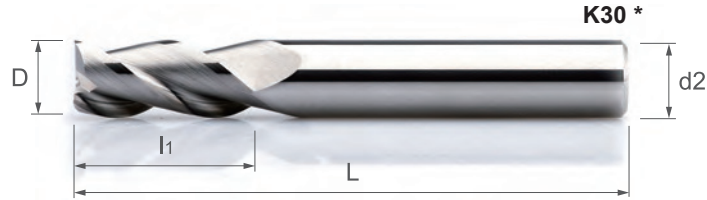
3

Chip Breaker

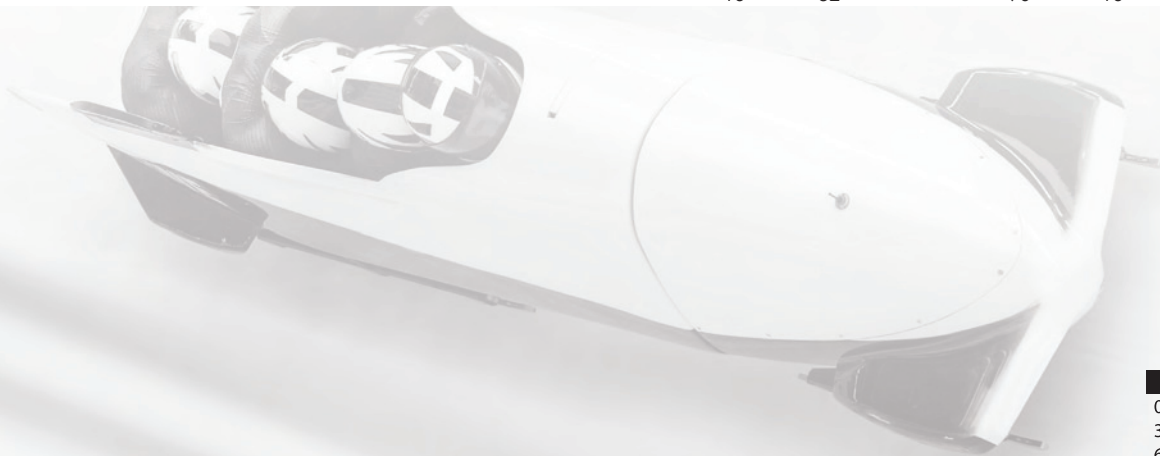
Improve plunging capability



AL SE Standard DP Endmills



EDPNo./EDV-Nr./ CODEusine/CodiceEDP	Dimension (mm)					K30*	K31*
	D	L1	L2	L	d2 (h6)	T ... n	TiB2
=*+Ødata							
0100 040 04	1	3		40	4	●	●
0150 040 04	1.5	4.5		40	4	●	●
0200 040 04	2	6.5		40	4	●	●
0250 040 04	2.5	6.5		40	4	●	●
0300	3	9		40	3	●	●
0300 050 06	3	9		50	6	●	●
0400	4	12		50	4	●	●
0400 050 06	4	12		50	6	●	●
0500 050 06	5	15		50	6	●	●
0600 050	6	16		50	6	●	●
0600 060	6	20		60	6	●	●
0800	8	20		64	8	●	●
1000 070	10	22		70	10	●	●
1000 075	10	31		75	10	●	●
1200	12	25		75	12	●	●
1600	16	32		90	16	●	●



mm	Tol. µm
0.1 ~ 2.9	-0 / -20
3.0 ~ 6.0	-0 / -25
6.0 ~ 30.0	-0 / -30

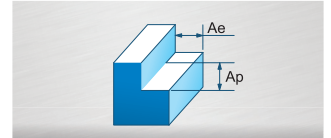
Material group - Material-Gruppe - Groupe matière - Gruppo materiali - 材质主类

N01	N02	N03	K01	K02	P01	P02	P03	M01	M02	S01	S02	S03	H01	H02	O1	O2
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Working Material	Cutting Parameter
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TECHNICAL SPECIFICATIONS SUBJECT TO CHANGE WITHOUT PRIOR NOTICE

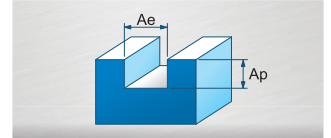
Al SE Standard DP Endmills Cutting Parameters



3 Z Side Milling		D (mm)	Z	Vc (m/min)	Fz (mm)	Ap (mm)	Ae (mm)	n (min-1)	Vf (mm/min)
ALUMINIUM	M02	1	3	126	0.010 ~ 0.014	≤1.5D	≤0.3D	40000	1200 ~ 1680
		2	3	251	0.027 ~ 0.032	≤1.5D	≤0.3D	40000	3240 ~ 3840
		3	3	377	0.044 ~ 0.051	≤1.5D	≤0.3D	40000	5280 ~ 6120
		4	3	503	0.062 ~ 0.069	≤1.5D	≤0.5D	40000	7440 ~ 8280
		5	3	575 ~ 628	0.079 ~ 0.087	≤1.5D	≤0.5D	36610 ~ 40000	8680 ~ 10440
		6	3	575 ~ 690	0.096 ~ 0.106	≤1.5D	≤0.5D	30500 ~ 36610	8780 ~ 11640
		8	3	575 ~ 690	0.120 ~ 0.132	≤1.5D	≤0.5D	22880 ~ 27450	8240 ~ 10870
		10	3	575 ~ 690	0.143 ~ 0.157	≤1.5D	≤0.5D	18300 ~ 21960	7850 ~ 10340
		12	3	575 ~ 690	0.167 ~ 0.183	≤1.5D	≤0.5D	15250 ~ 18300	7640 ~ 10050
		14	3	575 ~ 690	0.190 ~ 0.209	≤1.5D	≤0.5D	13070 ~ 15690	7450 ~ 9840
16	3	575 ~ 690	0.214 ~ 0.235	≤1.5D	≤0.5D	11440 ~ 13730	7340 ~ 9680		
ALUMINIUM ALLOYS SI < 8%	M04.M05. M06. M07	1	3	126	0.008 ~ 0.012	≤1.5D	≤0.3D	40000	960 ~ 1440
		2	3	251	0.023 ~ 0.028	≤1.5D	≤0.3D	40000	2760 ~ 3360
		3	3	377	0.038 ~ 0.044	≤1.5D	≤0.3D	40000	4560 ~ 5280
		4	3	403 ~ 460	0.054 ~ 0.060	≤1.5D	≤0.5D	32030 ~ 36610	5190 ~ 6590
		5	3	402 ~ 460	0.069 ~ 0.076	≤1.5D	≤0.5D	25620 ~ 29280	5300 ~ 6680
		6	3	402 ~ 460	0.084 ~ 0.092	≤1.5D	≤0.5D	21350 ~ 24400	5380 ~ 6730
		8	3	402 ~ 460	0.105 ~ 0.115	≤1.5D	≤0.5D	16010 ~ 18300	5040 ~ 6310
		10	3	402 ~ 460	0.125 ~ 0.138	≤1.5D	≤0.5D	12810 ~ 14640	4800 ~ 6060
		12	3	403 ~ 460	0.146 ~ 0.160	≤1.5D	≤0.5D	10680 ~ 12200	4680 ~ 5860
		14	3	402 ~ 460	0.167 ~ 0.183	≤1.5D	≤0.5D	9150 ~ 10460	4580 ~ 5740
16	3	403 ~ 460	0.187 ~ 0.206	≤1.5D	≤0.5D	8010 ~ 9150	4490 ~ 5650		
COPPER	M03	1	3	126	0.008 ~ 0.012	≤1.5D	≤0.3D	40000	960 ~ 1440
		2	3	251	0.023 ~ 0.028	≤1.5D	≤0.3D	40000	2760 ~ 3360
		3	3	345 ~ 377	0.038 ~ 0.044	≤1.5D	≤0.3D	36610 ~ 40000	4170 ~ 5280
		4	3	345 ~ 403	0.054 ~ 0.060	≤1.5D	≤0.5D	27450 ~ 32030	4450 ~ 5770
		5	3	345 ~ 402	0.069 ~ 0.076	≤1.5D	≤0.5D	21960 ~ 25620	4550 ~ 5840
		6	3	345 ~ 402	0.084 ~ 0.092	≤1.5D	≤0.5D	18300 ~ 21350	4610 ~ 5890
		8	3	345 ~ 402	0.105 ~ 0.115	≤1.5D	≤0.5D	13730 ~ 16010	4320 ~ 5520
		10	3	345 ~ 402	0.125 ~ 0.138	≤1.5D	≤0.5D	10980 ~ 12810	4120 ~ 5300
		12	3	345 ~ 403	0.146 ~ 0.160	≤1.5D	≤0.5D	9150 ~ 10680	4010 ~ 5130
		14	3	345 ~ 402	0.167 ~ 0.183	≤1.5D	≤0.5D	7840 ~ 9150	3930 ~ 5020
16	3	345 ~ 403	0.187 ~ 0.206	≤1.5D	≤0.5D	6860 ~ 8010	3850 ~ 4950		
BRASS, BRONZE	M08, M09	1	3	126	0.008 ~ 0.012	≤1.5D	≤0.3D	40000	960 ~ 1440
		2	3	230 ~ 251	0.023 ~ 0.028	≤1.5D	≤0.3D	36610 ~ 40000	2530 ~ 3360
		3	3	230 ~ 287	0.038 ~ 0.044	≤1.5D	≤0.3D	24400 ~ 30500	2780 ~ 4030
		4	3	230 ~ 288	0.054 ~ 0.060	≤1.5D	≤0.5D	18300 ~ 22880	2960 ~ 4120
		5	3	230 ~ 287	0.069 ~ 0.076	≤1.5D	≤0.5D	14640 ~ 18300	3030 ~ 4170
		6	3	230 ~ 287	0.084 ~ 0.092	≤1.5D	≤0.5D	12200 ~ 15250	3070 ~ 4210
		8	3	230 ~ 288	0.105 ~ 0.115	≤1.5D	≤0.5D	9150 ~ 11440	2880 ~ 3950
		10	3	230 ~ 287	0.125 ~ 0.138	≤1.5D	≤0.5D	7320 ~ 9150	2750 ~ 3790
		12	3	230 ~ 288	0.146 ~ 0.160	≤1.5D	≤0.5D	6100 ~ 7630	2670 ~ 3660
		14	3	230 ~ 288	0.167 ~ 0.183	≤1.5D	≤0.5D	5230 ~ 6540	2620 ~ 3590
16	3	230 ~ 288	0.187 ~ 0.206	≤1.5D	≤0.5D	4580 ~ 5720	2570 ~ 3530		

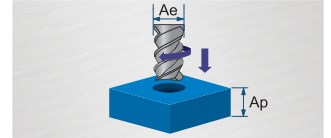
Note : Vc plus 15% for coating tool.

Al SE Standard DP Endmills Cutting Parameters



3 Z Slotting		D (mm)	Z	Vc (m/min)	Fz (mm)	Ap (mm)	Ae (mm)	n (min-1)	Vf (mm/min)
ALUMINIUM	M02	1	3	126	0.008 ~ 0.011	≤0.75D	≤1.0D	40000	960 ~ 1320
		2	3	251	0.022 ~ 0.026	≤0.75D	≤1.0D	40000	2640 ~ 3120
		3	3	377	0.036 ~ 0.041	≤0.75D	≤1.0D	40000	4320 ~ 4920
		4	3	503	0.049 ~ 0.055	≤1.0D	≤1.0D	40000	5880 ~ 6600
		5	3	575 ~ 628	0.063 ~ 0.070	≤1.0D	≤1.0D	36610 ~ 40000	6920 ~ 8400
		6	3	575 ~ 690	0.077 ~ 0.084	≤1.0D	≤1.0D	30500 ~ 36610	7050 ~ 9230
		8	3	575 ~ 690	0.096 ~ 0.105	≤1.0D	≤1.0D	22880 ~ 27450	6590 ~ 8650
		10	3	575 ~ 690	0.115 ~ 0.126	≤1.0D	≤1.0D	18300 ~ 21960	6310 ~ 8300
		12	3	575 ~ 690	0.133 ~ 0.147	≤1.0D	≤1.0D	15250 ~ 18300	6080 ~ 8070
		14	3	575 ~ 690	0.152 ~ 0.167	≤1.0D	≤1.0D	13070 ~ 15690	5960 ~ 7860
16	3	575 ~ 690	0.171 ~ 0.188	≤1.0D	≤1.0D	11440 ~ 13730	5870 ~ 7740		
ALUMINIUM ALLOYS SI < 8%	M04.M05. M06. M07	1	3	126	0.006 ~ 0.010	≤0.75D	≤1.0D	40000	720 ~ 1200
		2	3	251	0.019 ~ 0.022	≤0.75D	≤1.0D	40000	2280 ~ 2640
		3	3	377	0.031 ~ 0.035	≤0.75D	≤1.0D	40000	3720 ~ 4200
		4	3	403 ~ 460	0.043 ~ 0.048	≤1.0D	≤1.0D	32030 ~ 36610	4130 ~ 5270
		5	3	402 ~ 460	0.055 ~ 0.061	≤1.0D	≤1.0D	25620 ~ 29280	4230 ~ 5360
		6	3	402 ~ 460	0.067 ~ 0.074	≤1.0D	≤1.0D	21350 ~ 24400	4290 ~ 5420
		8	3	402 ~ 460	0.084 ~ 0.092	≤1.0D	≤1.0D	16010 ~ 18300	4030 ~ 5050
		10	3	402 ~ 460	0.100 ~ 0.110	≤1.0D	≤1.0D	12810 ~ 14640	3840 ~ 4830
		12	3	403 ~ 460	0.117 ~ 0.128	≤1.0D	≤1.0D	10680 ~ 12200	3750 ~ 4680
		14	3	402 ~ 460	0.133 ~ 0.147	≤1.0D	≤1.0D	9150 ~ 10460	3650 ~ 4610
16	3	403 ~ 460	0.150 ~ 0.165	≤1.0D	≤1.0D	8010 ~ 9150	3600 ~ 4530		
COPPER	M03	1	3	126	0.006 ~ 0.010	≤0.75D	≤1.0D	40000	720 ~ 1200
		2	3	251	0.019 ~ 0.022	≤0.75D	≤1.0D	40000	2280 ~ 2640
		3	3	345 ~ 377	0.031 ~ 0.035	≤0.75D	≤1.0D	36610 ~ 40000	3400 ~ 4200
		4	3	345 ~ 403	0.043 ~ 0.048	≤1.0D	≤1.0D	27450 ~ 32030	3540 ~ 4610
		5	3	345 ~ 402	0.055 ~ 0.061	≤1.0D	≤1.0D	21960 ~ 25620	3620 ~ 4690
		6	3	345 ~ 402	0.067 ~ 0.074	≤1.0D	≤1.0D	18300 ~ 21350	3680 ~ 4740
		8	3	345 ~ 402	0.084 ~ 0.092	≤1.0D	≤1.0D	13730 ~ 16010	3460 ~ 4420
		10	3	345 ~ 402	0.100 ~ 0.110	≤1.0D	≤1.0D	10980 ~ 12810	3290 ~ 4230
		12	3	345 ~ 403	0.117 ~ 0.128	≤1.0D	≤1.0D	9150 ~ 10680	3210 ~ 4100
		14	3	345 ~ 402	0.133 ~ 0.147	≤1.0D	≤1.0D	7840 ~ 9150	3130 ~ 4040
16	3	345 ~ 403	0.150 ~ 0.165	≤1.0D	≤1.0D	6860 ~ 8010	3090 ~ 3960		
BRASS, BRONZE	M08, M09	1	3	126	0.006 ~ 0.010	≤0.75D	≤1.0D	40000	720 ~ 1200
		2	3	230 ~ 251	0.019 ~ 0.022	≤0.75D	≤1.0D	36610 ~ 40000	2090 ~ 2640
		3	3	230 ~ 287	0.031 ~ 0.035	≤0.75D	≤1.0D	24400 ~ 30500	2270 ~ 3200
		4	3	230 ~ 288	0.043 ~ 0.048	≤1.0D	≤1.0D	18300 ~ 22880	2360 ~ 3290
		5	3	230 ~ 287	0.055 ~ 0.061	≤1.0D	≤1.0D	14640 ~ 18300	2420 ~ 3350
		6	3	230 ~ 287	0.067 ~ 0.074	≤1.0D	≤1.0D	12200 ~ 15250	2450 ~ 3390
		8	3	230 ~ 288	0.084 ~ 0.092	≤1.0D	≤1.0D	9150 ~ 11440	2310 ~ 3160
		10	3	230 ~ 287	0.100 ~ 0.110	≤1.0D	≤1.0D	7320 ~ 9150	2200 ~ 3020
		12	3	230 ~ 288	0.117 ~ 0.128	≤1.0D	≤1.0D	6100 ~ 7630	2140 ~ 2930
		14	3	230 ~ 288	0.133 ~ 0.147	≤1.0D	≤1.0D	5230 ~ 6540	2090 ~ 2880
16	3	230 ~ 288	0.150 ~ 0.165	≤1.0D	≤1.0D	4580 ~ 5720	2060 ~ 2830		

Al SE Standard DP Endmills Cutting Parameters



3 Z Plunging		D (mm)	Z	Vc (m/min)	Fz (mm)	n (min-1)	Vf (mm/min)
Work Material	Material Groups						
ALUMINIUM	M02	1	3	70	0.002	22,280	160
		2	3	90	0.005	14,320	210
		3	3	120	0.010	12,730	370
		4	3	120	0.013	9,550	380
		5	3	120	0.022	7,640	500
		6	3	120	0.029	6,370	550
		8	3	120	0.038	4,770	550
		10	3	120	0.047	3,820	540
		12	3	120	0.050	3,180	480
		14	3	120	0.050	2,730	410
16	3	120	0.070	2,390	500		
ALUMINIUM ALLOYS SI < 8%	M04.M05. M06. M07	1	3	60	0.002	19,100	90
		2	3	80	0.004	12,730	130
		3	3	110	0.008	11,670	280
		4	3	110	0.011	8,750	290
		5	3	110	0.018	7,000	370
		6	3	110	0.024	5,840	420
		8	3	110	0.032	4,380	420
		10	3	110	0.039	3,500	410
		12	3	110	0.042	2,920	370
		14	3	110	0.042	2,500	320
16	3	110	0.056	2,190	370		
COPPER	M03	1	3	60	0.002	19,100	90
		2	3	80	0.004	12,730	130
		3	3	100	0.008	10,610	260
		4	3	100	0.011	7,960	270
		5	3	100	0.018	6,370	340
		6	3	100	0.024	5,310	380
		8	3	100	0.032	3,980	380
		10	3	100	0.039	3,180	370
		12	3	100	0.042	2,650	330
		14	3	100	0.042	2,270	290
16	3	100	0.056	1,990	330		
BRASS, BRONZE	M08, M09	1	3	50	0.002	15,920	90
		2	3	70	0.004	11,140	120
		3	3	90	0.007	9,550	210
		4	3	90	0.010	7,160	210
		5	3	90	0.016	5,730	280
		6	3	90	0.022	4,770	310
		8	3	90	0.029	3,580	310
		10	3	90	0.035	2,860	300
		12	3	90	0.038	2,390	270
		14	3	90	0.038	2,050	230
16	3	90	0.050	1,790	270		

Note : Vc plus 15% for coating tool.

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